Chippewa Valley Schools
Career Technical Education

Claire Brisson, Director of Career Technical Education

Announces a **NEW** program for 2014/15!

**Mechatronics & Robotics**
15 CTE Programs Offered:

- Automotive Technology
- Business (3 pathways)
  - Business Management
  - Accounting & Finance
  - Information Technology
- Construction Trades
- Culinary Arts
- Design Technology (2 pathways)
  - Engineering / Architecture
- Family Consumer Science
- Graphic Design
- Marketing
- Medical Academy
- Mechatronics & Robotics
- New CTE program 2014/15!
- Teacher Cadet
- Woodworking & Cabinetmaking
Shared Use w/Design Technology of the Fabrication Lab for projects requiring additional tooling, technology, space, outdoor access, etc.

Mechanical Systems + Electronic Systems + Control Systems + Computers = Mechatronics & Robotics
Mechatronics & Robotics

New CTE program 2014/15!

Interested Students:

Must have **two** elective hours available for the full year in their 11th grade schedule.

Ideally students will commit to two years of study, with another 2-hr block/year-long course in the senior year to go more deeply into mechatronics with expanded opportunities for in-depth, project-based application, in the student’s area of interest.
Mechatronics & Robotics

New CTE program 2014/15!

Qualifies for:

✓ VPAA credit
  (visual performing and applied art)

✓ Math-related credit in the senior year
Multidisciplinary
Mechatronics skills are key to a broad range of engineering and technician jobs that cross traditional boundaries.

Connects to Postsecondary
Articulation w/colleges offers “stackable” credentials and pathway progression.

Supports MI Priority Areas & Multiple Emerging Sectors:
Homeland Security
Advanced Manufacturing
Robotics & Automation
Advanced Electronics & Controls
Alternative Energy & Power Generation
Mechatronics = Industry demand in multiple sectors...
Strong demand for mechatronics expertise prompted Gov. Snyder to begin MAT2 in 2013 which provides FREE TUITION and paid employment to qualified applicants accepted into the post high school training program.

Students who successfully complete Chippewa Valley Schools' Mechatronics & Robotics program will be ideal candidates for this opportunity!
Michigan Advanced Technician Training

3-years: Alternating college + industry work/apply
2-years: Full time employment w/sponsoring company

Tuition/ books/ computer
(Paid by employer!)
$200/ week stipend
(Get paid to go to college!)
PT employment
(With built-in wage increases!)

Upon completion of program:
• Associate’s Degree
• Industry Certification
• German Diploma

and
★ FULL TIME EMPLOYMENT!★

Mitalent.org/mat2
Collaboration with our 

Fabrication Lab

Communication Skills

The Hallmarks of CTE

Community/Industry

Academic Integration

+ Hands-on

Technology

+ Project-based
Michael Lamach is Chairman, President and CEO of all this...

AND...He was a Macomb County CTE Student!

“I always felt a sense of accomplishment in your class, and the continuous, subtle challenge you always gave me to take on more difficult assignments...we were always on a mission...to do something that felt of purpose.”
Perkins focus on:

- High Skill
- High Wage
- High Demand Occupations

National and State Priority

Mechatronics & Robotics is part of all these initiatives:

COMMON CORE STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

Perkins Act of 2006
Did you know?

2012 - Half of recent college graduates either jobless or underemployed.

10% of young adults moved back in w/their parents. (For 26-year-olds, 20%)

89 million working age Americans not part of labor market. Why? Often lack skills for 21st century jobs.

Meanwhile...U.S. stopped educating/training enough people in mid-level technical skills jobs most needed.

In 2010, # of college grads & technicians w/postsecondary STEM credentials = 225,000. Far short of 400,000 needed by 2015.

Four sectors in U.S. in which the skills crisis is particularly acute: (1) Healthcare (2) Info Tech (3) Aerospace (4) Manufacturing

[Gordon, 2013, Future Jobs: Solving the Employment and Skills Crisis]
Take a NEW look at manufacturing...

“Manufacturing has become part rocket science”
Tech-driven machines require understanding of metallurgy, physics, chemistry, pneumatics, electrical wiring, and computer code.

Workers need problem-solving skills.


Job-Skills Mismatch – Escalating globally. China short 10 million workers by 2020. China graduates 600,000 engineers annually...only 10% meet professional standards of major U.S. & European firms. India is no better, & both countries have corruption problems.

[Gordon, 2013, Future Jobs: Solving the Employment and Skills Crisis]
Take a **NEW** look at manufacturing...

**Changing Demographics** - Skills-gap problem compounded in U.S. by 79 million baby boomers retiring w/in 20 years (10,000/day)

Only 40 million Generation Xers to replace them.

**H-1B Visas** - Cannot solve present or future skilled talent needs. China & India have extensive incentives to lure expatriates back, while we do not produce enough workers w/the right skills.

**Job Openings** – Sept 2012, 184,000 for engineers & 600,000 for skilled technical positions in manufacturing sector.

**Transformational Technologies** - (1) Big Data (Cloud) (2) Nanoscience (3) 3-D Printing (4) **Advanced Robotics**

[Gordon, 2013, Future Jobs: Solving the Employment and Skills Crisis]
Top Technicians:

- Electrical And Electronic Engineering Technicians
- Electronics Engineering Technicians
- Electro-Mechanical Technicians
- Manufacturing Production Technicians
- Civil Engineering Technicians
- Electrical Engineering Technicians
- Industrial Engineering Technicians
- Environmental Engineering Technicians
- Aerospace Engineering And Operations Technicians
- Remote Sensing Scientists And Technologists
- Robotics Technicians
- Manufacturing Engineering Technologists
- Industrial Engineering Technologists
- Electrical Engineering Technologists

20% of Michigan’s manufacturing workforce is over the age of 55.

Diverse educational profile in manufacturing (lots of opportunity) across the educational spectrum.

Online job postings from Burning Glass technologies, top occupations for Southeast Michigan in the past 3 months. [Dec 2012]
Top Engineering Fields:

There are 4,300 manufacturing firms in Wayne, Oakland, and Macomb Counties.

Only 1 jobseeker for every 5 job postings for engineering!

Online job postings from Burning Glass Technologies, top occupations for Michigan in the past 3 months. [Dec 2012]
7 key takeaways

1. Highly skilled workers are in demand. Availability of talent for engineering and skilled trades has been increasingly difficult to find.

2. Many manufacturing jobs require less than 5 years of experience. In some cases, required experience has dropped over the last year.

3. Opportunities exist in manufacturing for both jobseekers who hold a 4 year degree, and those who do not.

4. Employees need a broad range of skills – and the ability to learn new ones.

5. Technology is a critical element of 21st century manufacturing.

6. We will have additional gaps to fill as workers retire.

7. Secondary education has an impact on our talent supply.
We need Innovation

Innovation is at the heart of engineering solutions for 21st century challenges:

“Innovation requires systems thinking; it’s cross disciplinary, collaborative, and outward looking.”

[Dr. Michael Wynblatt, Eaton Corp.]

“The core skill of innovators is error recovery, not failure avoidance.”

[Randy Nelson, former Dean of Pixar University]

“People who’ve learned to ask great questions and be inquisitive...solve the biggest problems in ways that have the most impact on innovation.”

[Tony Wagner, The Global Achievement Gap]
Essential qualities of innovators:

- Perseverance
- Willingness to experiment
- Take calculated risks
- Tolerate failure
- Capacity for “design thinking”
- Critical thinking

5 characteristics of “design thinkers”

1. Empathy – imagine the world from multiple perspectives
2. Integrative thinking – see all aspects of a problem & possible breakthroughs
3. Optimism – no matter how challenging, a solution can be found
4. Experimentalism – trial/error; explore solutions in new/creative ways
5. Collaboration – interdisciplinary

Things that stifle innovation

- Rigid bureaucratic structure
- Isolation
- High-stress/threat environment

Mechatronics & Robotics
For more information about this NEW program you may contact:

- Your counselor

- CTE Department staff:
  
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Be a part of the NEW innovative CTE program for 2014/15!

Mechatronics & Robotics

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