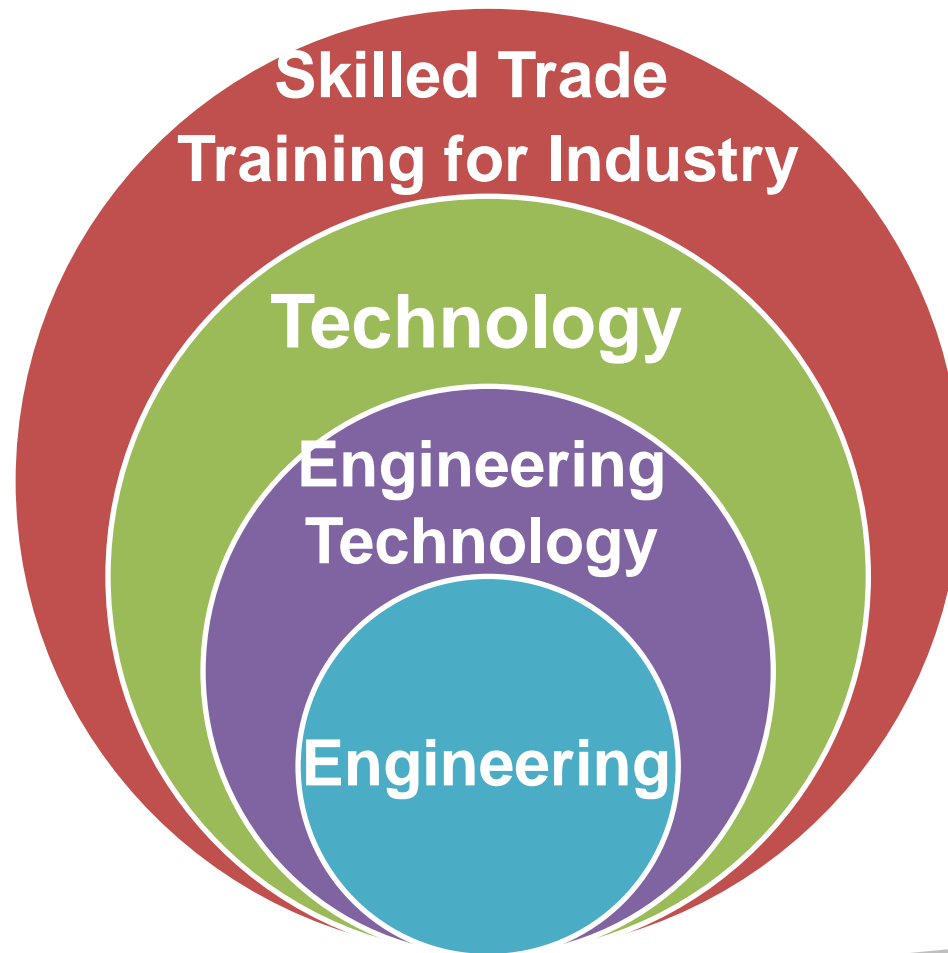


Engineering Education Pathways at Henry Ford College

May 2020

Dr. Hassan Nameghi
Chair of Pre-Engineering Department
Email: hnameghi@hfcc.edu

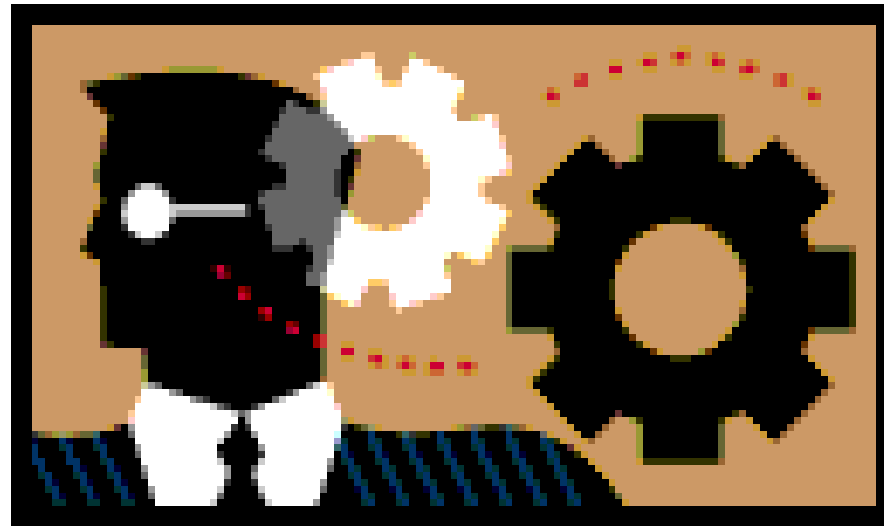
HFC offers all



- More Hands-on
- Less Math Requirements

Who is Engineer?

- Apply knowledge **of math and science**
(Preparatory College Path)
- Conduct design and analysis
- Solve problems
- Develop
 - devices
 - processes
 - structures
 - systems



Engineering Technology?

Engineer Technologist is the same as Engineer, but
more hands-on and less analytical.

Less mathematics

More Practical



Technician



Engineer



Engineering
Technology

Engineering at HFC in 2020

4-Year
Universities

Bachelor in Engineering
Technology in two years



Bachelor in Engineering in two years



Transfer to an
Engineering School

Descent
Career

Associate degree in
Engineering
Technology



Associate degree in
Pre-Engineering

Engineering at HFC in 2020

Graduate with
Pre-Engineering.
Just select it in
application

BS in Engineering Technology
e.g. Mechanical Engineering Technology

BS in Engineering
e.g. Mechanical Engineering



WAYNE STATE
UNIVERSITY



DEARBORN

New Programs in 2020

Engineering Technology
Pathway: Mechanical/Electrical

Pathway: Mechanical/Industrial
Pathway: Electrical/Computer

Any technical program (26 programs
including trade)

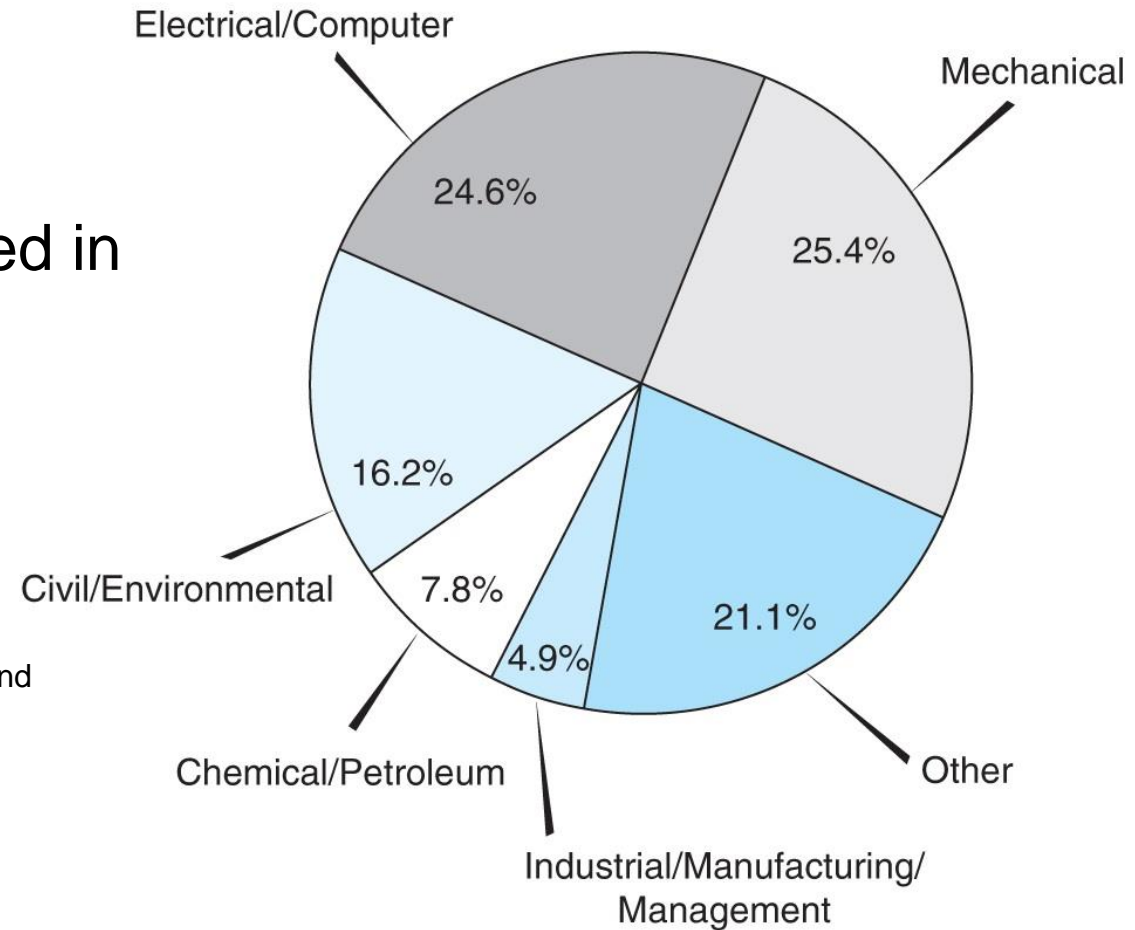
Pre-Engineering: General

Engineering Degrees by Discipline

68,206 engineering degrees were awarded in 2008.

Job Search before choosing a degree

(data from ASEE Profiles in Engineering and Technology Colleges, 2008 Edition.)



What Do Civil Engineers Do?

Civil Engineers design and supervise, among others, the construction of roads, buildings, airports, tunnels, dams, bridges, water supply, and water and wastewater treatment systems. Civil engineering is concerned with providing public infrastructure and services.



What Do Mechanical Engineers Do?

***Mechanical Engineers* are involved in the design, development, testing, and manufacturing of machines, robots, tools, power generating equipment such as steam and gas turbines, heating, cooling, and refrigerating equipment, and internal combustion engines.**



What Do Electrical Engineers Do?

Electrical Engineers design, develop, test, and supervise the manufacturing of electrical equipment, including lighting and wiring for buildings, cars, buses, trains, ships, and aircraft; power generation and transmission equipment for utility companies; electric motors found in various products; control devices; and radar equipment.



What Do Chemical Engineers Do?

Chemical Engineers use the principles of chemistry and basic engineering sciences to solve a variety of problems related to the production of chemicals and their use in various industries, including the pharmaceutical, electronic, and photographic industries.



What Do Industrial Engineers Do?

***Manufacturing/Industrial Engineers* develop, coordinate, and supervise the process of manufacturing all types of products. They are concerned with making products efficiently and at minimum cost. They are involved in all aspects of production, including scheduling and materials handling and the design, development, supervision, and control of assembly lines.**



Mechanical vs Electrical Engineer

Tinkercad www.tinkercad.com

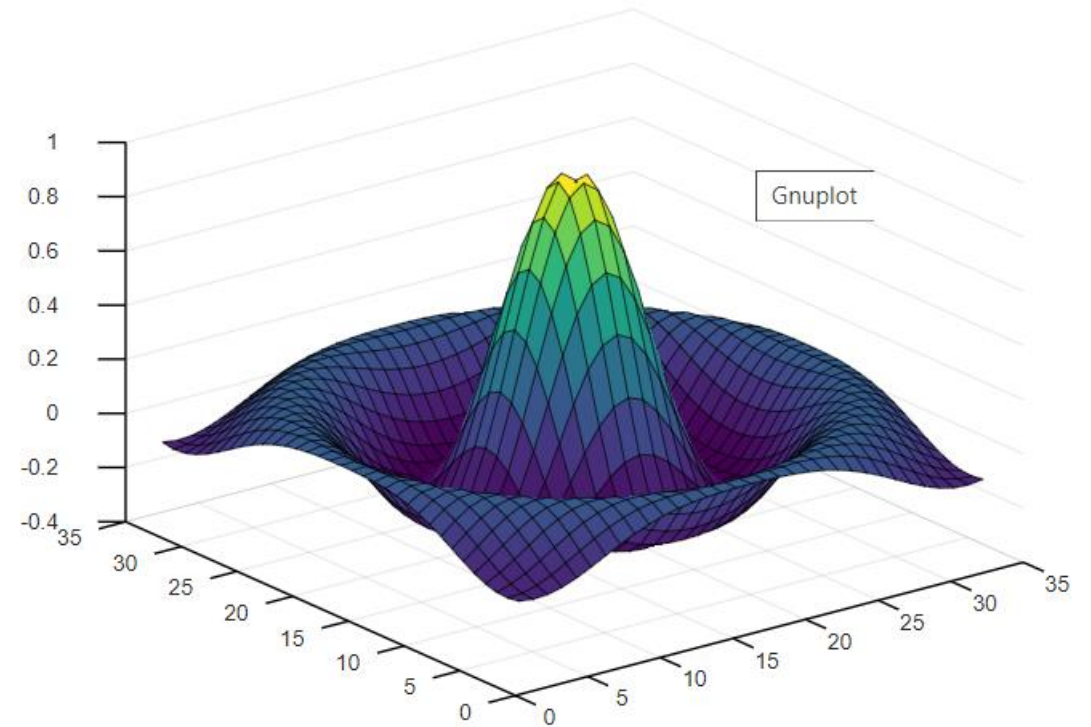
- Mechanical: 3D Design: <https://youtu.be/r5yY6bZMX9g>
- Electrical: Circuits: <https://youtu.be/QGOkiOS1sWM>

MATLAB – Computation for Engineers

MATLAB Online: <https://octave-online.net/>

Make a Mexican Hat

```
[x,y] = meshgrid(-8:0.5:8);  
r = sqrt(x.^2+y.^2);  
z = sin(r)./r;  
surf(z)
```



Learn MATLAB: <https://hfc.yuja.com/V/Video?v=312207&a=871692561>

Computer Science/Software Engineering/Computer Engineering

Coding, programming, and design of software

Just press F12 in a web browser

Computer
Science or
Software
Engineering

A combination of different programs:
starting with Pre-Engineering + **AS in
Computer Science (2019)**

Design of Computer Hardware

Electrical or
Computer
Engineering

Pre-Engineering



Learn Computer Science

Free Website to Learn Coding: <https://www.w3schools.com/>

[w3schools.com](https://www.w3schools.com/)

That's how I learnt it:

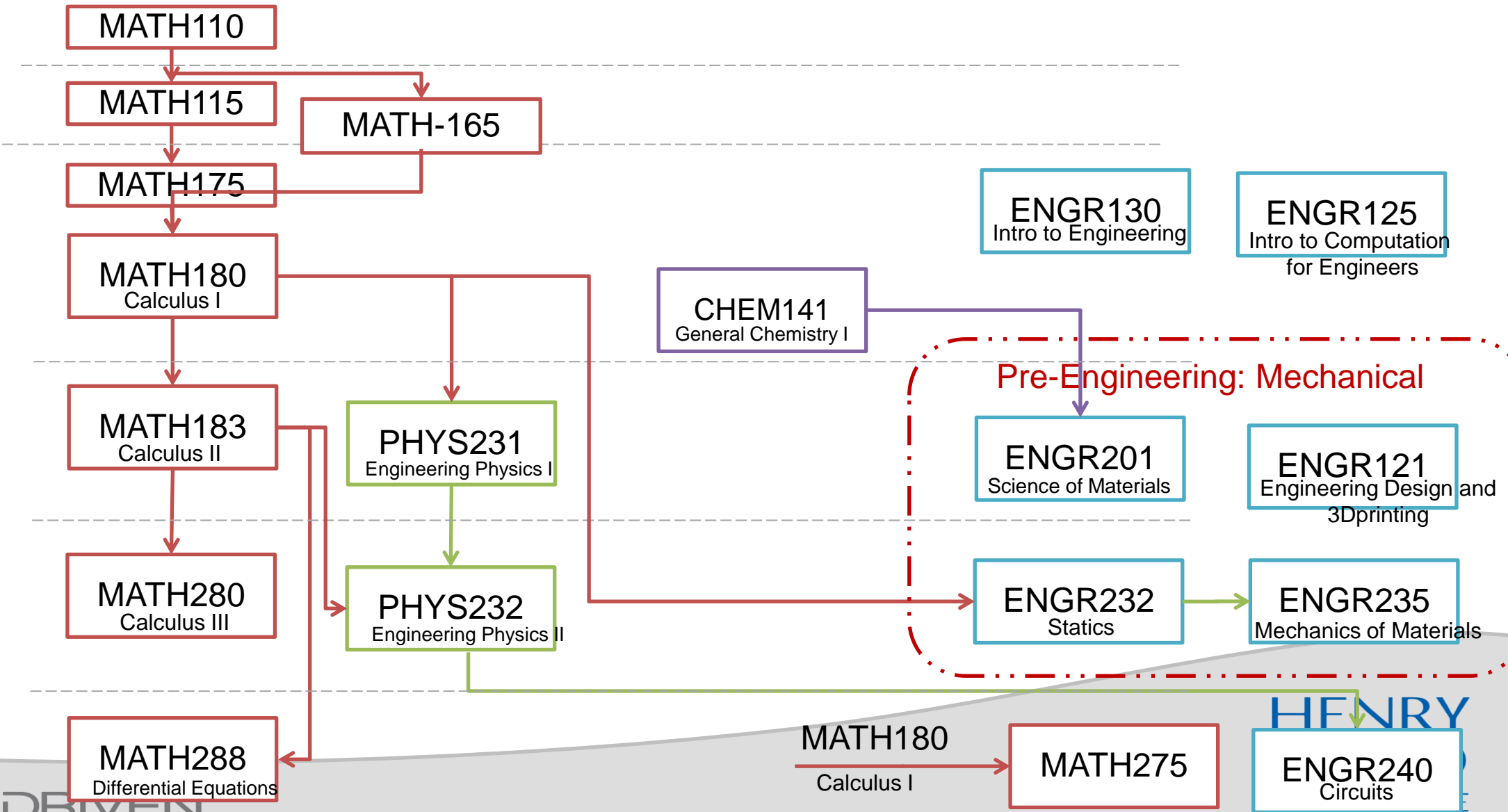
Here is my website for image processing for laser engraving: www.techiephoto.com

Computer Science Students

- There no specific degree for students planning to transfer to UM-Dearborn. They can start at AS in Pre-Engineering, then switch to AS in Computer Science.



Pre-Engineering
and beyond



Transfer Equivalency Table for ENGR

(Effective Fall 2020)

	University of Michigan - Dearborn	Wayne State University	Program at HFC that has the course	Offerings
ENGR-130: Introduction to Engineering	ENGR-130 +ENGR-125 =ENGR 100	BE 1200 for majors other than ME*	Pre-Engineering: General	SP/SU/FA/WI
ENGR-125: Introduction to Computation for Engineers	Starting Fall 2020	BE 1500	Pre-Engineering: General	FA/WI
ENGR-232: Statics	ENGR-232 +ENGR-235 =ME 260	ME 2410	Pre-Engineering: Mechanical/Industrial	SP/FA
ENGR-235: Mechanics of Materials		ME 2420	Pre-Engineering: Mechanical/Industrial	SU/FA
ENGR-121: Engineering Design and 3D printing	ENGR 126	BE 1200 for Mechanical Engineering	Pre-Engineering: Mechanical/Industrial	FA/WI
ENGR-201: Science of Materials	ENGR 250	BE 1300	Pre-Engineering: Mechanical/Industrial	FA/WI
ENGR-233: Dynamics	Does not transfer	ME 3400	Pre-Engineering: Mechanical/Industrial	SU/WI
ENGR-240: Circuits	ECE 210	Does not transfer	Pre-Engineering: Electrical/Computer	SU/WI

Notes

- CHEM-131 (Health Career) != CHEM-141 (Engineering)
- PHYS-131 (Pre-Med) != PHYS-231 (Engineering)
- PHYS-132 (Pre-Med) != PHYS-232 (Engineering)

Engineering Technology Programs

- Engineering Technology – Mechanical → Hassan Nameghi
- Engineering Technology – Construction Management → Hassan Nameghi
- Electrical Engineering Technology → Mark Siedlik (msiedlik@hfcc.edu)
- Engineering Technology – Drafting → Roger Weekes (rrweekes@hfcc.edu)

Transfer Partners

Private School vs Public School

- University of Michigan – Dearborn
- Wayne State University

In progress:

- Eastern Michigan University
- Baker College
- Arizona State University (Online program in Electrical Engineering)

Co-op Eligibility

Academic Requirements

- Completion of 50 percent of core coursework, Calc 2
- Minimum grade point average of 2.5 in core course work
- Minimum overall grade point average of 2.0.

Job Search

www.indeed.com

It is suggested to conduct a regional job search when considering to select an Engineering Major

<http://careers.hfcc.edu>

Resume + Cover Letter + References + Soft skills

Explore Engineering Careers: <http://drnam.org/engineering/>

Facts

- How many students are active in Pre-Engineering Program?
- Student should be good in Math to Start Engineering?? Absolutely not?
- If a student wants to become an Architecture Engineer or Automotive Engineer or Biomedical Engineering, Drafting Engineers? Where should he/she start?
- Engineering is hands-on? No?

Advantages of HFC

- ✚ A great place to start with no mandatory admission requirement.
- ✚ Help you transfer to prestigious universities upon completion of your Associate Degree
- ✚ Articulation agreements guarantee the acceptance of our graduates' credit to the final two years of engineering schools

Advantages of HFC

- ✚ Affordable tuition (Save 16-20k before transfer to a 4-year school)
- ✚ Small classes (<24 students) which made the face-to-face interaction easy. Students receive good feedback from the Instructors
- ✚ A place to grow and create an outstanding profile to apply for scholarships upon transferring to engineering school.