# An Overview of Engineering

#### Puget Sound Engineering Council (PSEC)

**PSEC** website: pseconline.org

#### Main Items Addressed in this Presentation

- $\checkmark$  What engineers do
- ✓ Types of engineering
- ✓ Future trends in engineering
- ✓ Outlook for young people
- ✓ What students should study

#### What Engineers Do

- Engineers in general are problem solvers
- Frequently, engineers design things that have real world applications
- Engineers have designed many products and structures that we use in our daily lives
- Engineers look for practical applications for things scientists and others discover
- Main engineering fields are Mechanical, Electrical, Civil, Aerospace, Chemical
- Smaller specialties include Industrial, Nuclear, Environmental, Petroleum, Ceramic, & Agricultural

#### **Aerospace Engineering**











#### **Architectural Engineering**









## **Automotive Engineering**









## **Chemical Engineering**











# **Civil Engineering**















## **Computer Engineering**







## **Electrical Engineering**











## **Electronics Engineering**







## **Industrial Engineering**









# Marine Engineering





## **Mechanical Engineering**







## **Petroleum Engineering**









## **Robotics Engineering**







# **Types of Engineering**

- Aeronautical
- Aerospace
- Agricultural
- Architectural
- Automotive
- Bio-chemical
- Bio-engineering
- Bio-medical
- Ceramic
- Chemical
- Civil
- Computer
- Corrosion
- Cost & Value
- Electrical

- Electronics
- Environmental
- Fire Protection
- Flight Test
- Forestry
- Geophysical
- Geological
- Geothermal
- Heating, Ventilation, & Air Conditioning
- Human Factors/ Ergonomics
- Hydraulics
- Illumination

# Types of Engineering (continued)

- Industrial
- Logistics
- Lubrication
- Manufacturing
- Marine/Ocean
- Materials
- Mechanical
- Metallurgical
- Mining
- Nanotechnology
- Nautical
- Naval Architecture
- Nuclear
- Optical

- Oceanographic
- Petroleum
- Plant Management
- Plastics
- Refrigeration
- Robotics & Automation
- Safety
- Software
- Structural
- Telecommunications
- Transportation
- Welding
  - [53 types listed]

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# 53 Types of Engineering Listed

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- Welding

#### **A Question for the Audience**

 What types of Engineers might play a role in designing and producing a new automobile? (*look at the scale model car in the picture*)



#### **Future Trends & Technology's Influence**

- Computers and the internet will continue to impact all engineering fields, including Engineering Education
- Virtual Reality will continue to integrate into design applications
- Bio-medical & Nanotechnology fields will continue to merge
- Artificial Intelligence (AI) will combine with Robotics to create much smarter machines
- Civil Engineering will be critical to replace bridges, older structures & environmental improvements

#### **Future Trends & Technology's Influence**

#### (continued)

- Alternative energy sources and new technologies will impact many engineering fields
- Many types of Engineers will help design more leisure time activities & electronic games
- Global impacts of increasing populations on housing, transportation, and food production
- Engineers & Scientists will continue to be drawn to outer space projects

## **Future Engineering in Space**





#### **Outlook for Young People Entering the Field**

- Excellent job prospects with unlimited variety of work, good pay & benefits
- Should enjoy math & science and have good study skills
- In addition to education, it requires practical experience
  - Intern or Co-op work during college is recommended
- Some specialty engineering fields may require a Masters degree or Ph.D.
- Later your educational degree, job experience, and field of interest will determine the type of engineering work you do

#### What High School Students Should Study

- Lots of Math & Science, but also English, History and other high school general courses
- Do some reading about types of engineering, check out web sites, and Discovery & Modern Marvels type TV shows
- Try to go on local manufacturing tours
- Interview working engineers, including any members of your immediate family or their friends
- Look at engineering school's web sites and particular departments of fields that interest you most

#### What High School Students Should Study (continued)

- Attend an engineering school's "Open House" event, if one is available locally
- Make sure you apply to an ABET accredited engineering school, that has the engineering specialty you are most interested in
- When at college, continue to investigate the type of engineering work that interests you most