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Which Engineering Major Should I Choose?

Stacy K. Firth, PhD

Engineering is Multidisciplinary

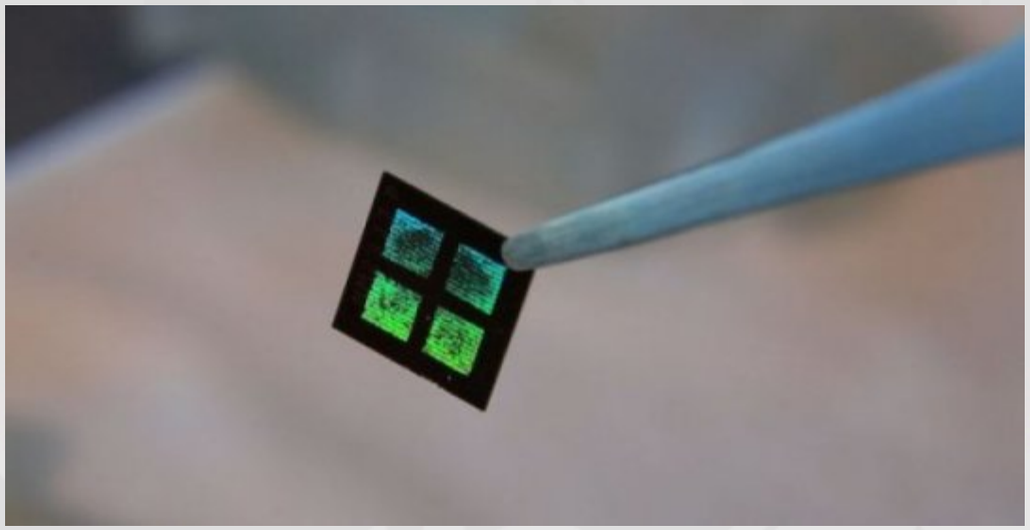
Artificial Kidney Project

Project Research Team:

- Chemical Engineers
- Biomedical Engineers
- Electrical Engineers

Production:

- Mechanical Engineers
- Manufacturing Engineers
- Chemical Engineers
- Material Scientists



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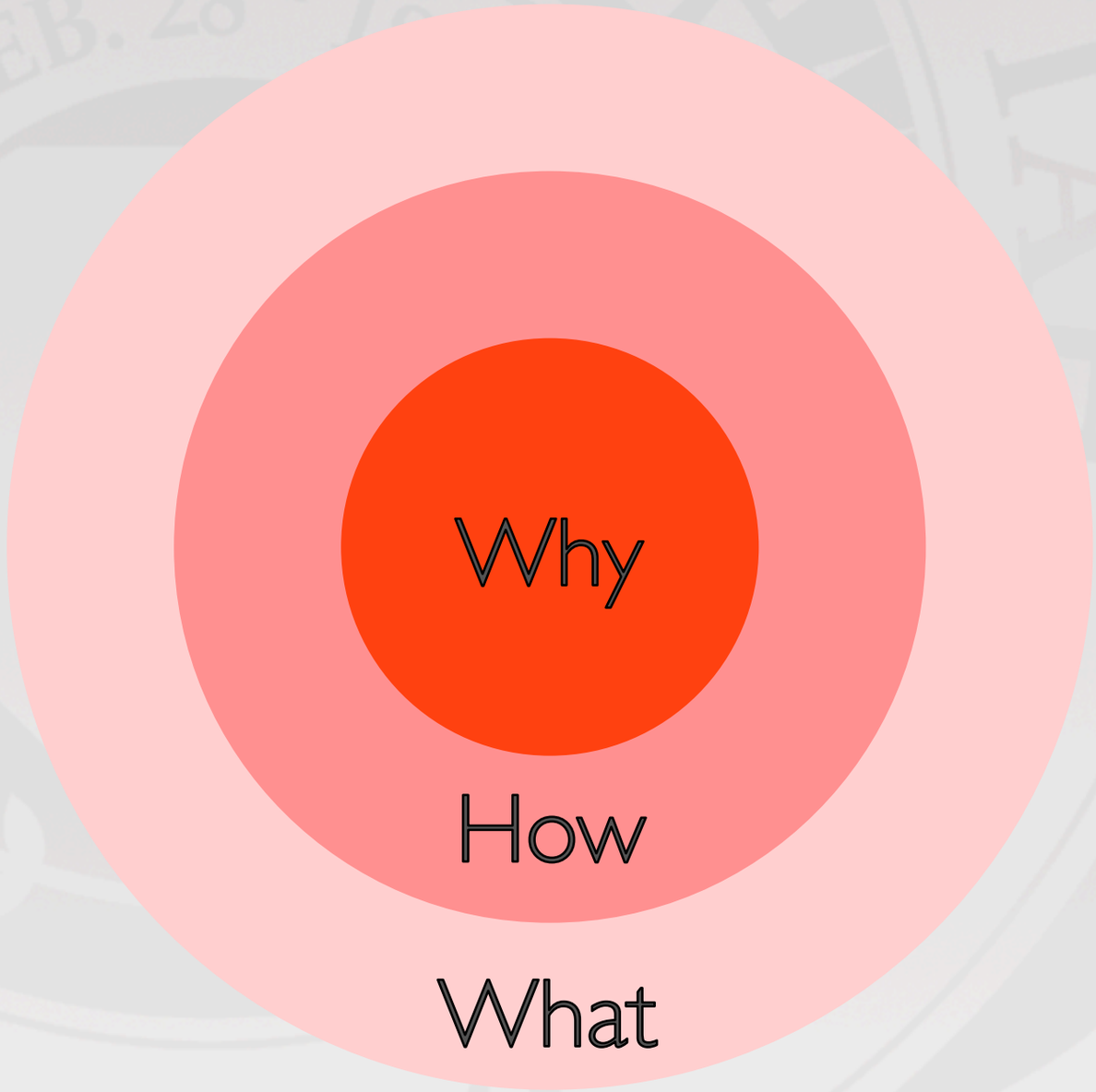
What – The job we do, the career we have.

How – The skills and education we gain to get there.

Why – Our purpose, what we love, what gets us up in the morning.



The Golden Circle – Simon Sinek

How to Decide?

Focus on the following two objectives.

Where you want to go:

- Careers, contributions, interests.
- Opportunities: Department of Labor's Bureau of Labor Statistics and the National Science Foundation

How you are going to get there:

- Course of study, internship experience.

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Courses Common to Engineering Majors

Course	BioE	Chem E	CVEE	ECE	MSE	ME	CS
Math 1310 Eng Calc I	×	×	×	×	×	×	×
Math 1320 Eng Calc II	×	×	×	×	×	×	×
Math 2210 Calc III or Math 3140 PDE	×	×	×	×	×	×	×
Math 2250 Diff Eq/Lin Alg	×	×	×	×	×	×	×
Phys 2210 Pysics for Sci and Eng I	×	×	×	×	×	×	×
Phys 2220 Pysics for Sci and Eng II	×	×	×	×	×	×	
Chem 1210 General Chemistry I	×	×	×		×	×	
Chem 1215 General Chemistry Lab I	×	×	×		×	×	
Chem 1220 General Chemistry II	×	×	×		×		
Chem 1225 General Chemistry Lab II	×	×	×		×		
Chem 2310 Organic Chemistry I	×	×			×		
Chem 2315 Organic Chemistry Lab I	×	×					
Biol 2020 Cell Biology or Biol 1210 Princ of Bio	×			×			

Communication, Ethics, Teamwork, Design, Projects

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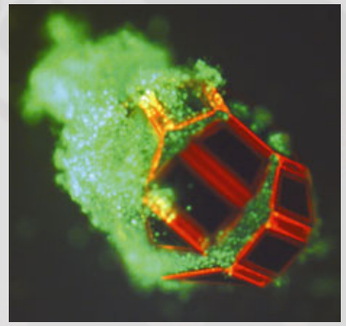
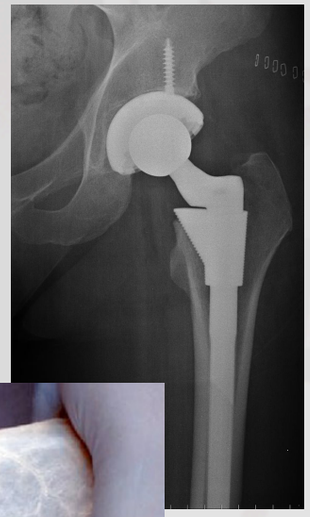
Bioengineering

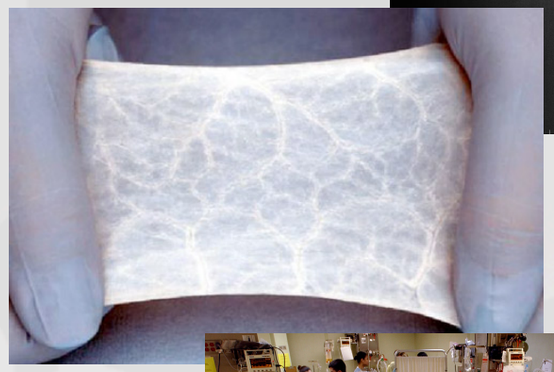
Technology that interfaces with biological systems

Modeling
Biomechanics
Biomaterials

- Bioinstrumentation
- Biomechanics





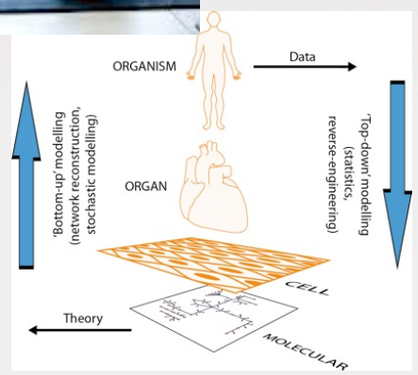


Computational Methods
Design

- Biomaterials
- Clinical Engineering

Biosignals
Physiology
Biotransport

- Rehabilitation Eng.
- Systems Physiology



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Chemical Engineering

Transformation of raw materials to finished products

Thermo-dynamics

Numerical Methods

- Pharmaceuticals
- Healthcare
- Polymers

Process Engineering

Fluid Mechanics

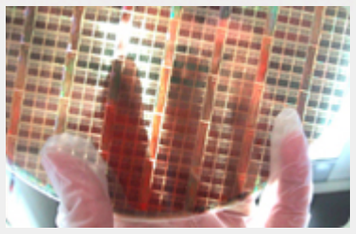
- Petrochemicals
- Food Processing
- Environmental health and safety

Heat Transfer

Mass Transfer

Reaction Engineering

- Specialty Chemicals
- Microelectronics
- Energy



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Civil and Environmental Engineering

Design, construction, and maintenance of infrastructure and the environment

Statics

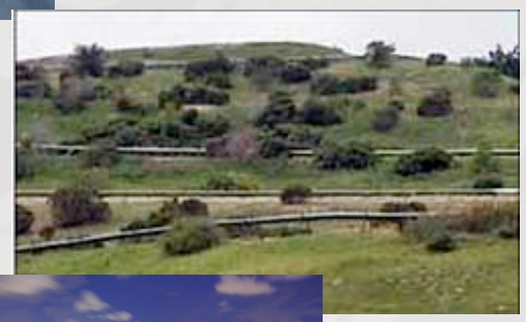
Thermo-dynamics

- Structural
- Construction

Strength of Materials

Structural Load & Analysis

- Environmental
- Transportation



Civil Engineering Materials

Hydraulics

- Geotechnical
- Water Resources

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Electrical and Computer Engineering

Harness electrons to do useful work

Electro-magnetics and Transmission

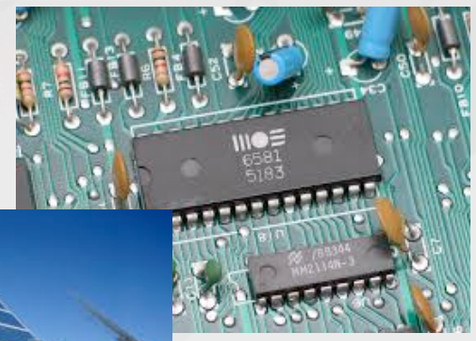
Computer Programming

- Power
- Communication

Digital Systems

Signal Processing

- Image Processing
- Circuit Design



Electrical Circuits

Semi-conductors

- Alternative Energy
- Energy Storage

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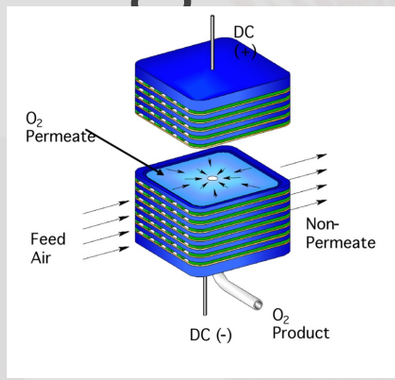
Materials Science and Engineering

Development of materials with desirable properties

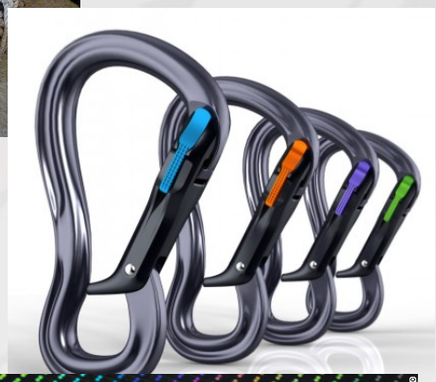
Polymers
Ceramics

- Ceramics
- Polymers



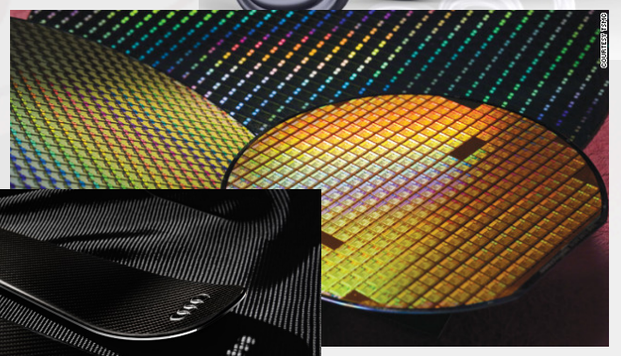
Materials Processing
Thermo-dynamics

- Organics
- Metals



Mechanical Properties
Kinetics of Solid-State

- Semiconductors
- Composites



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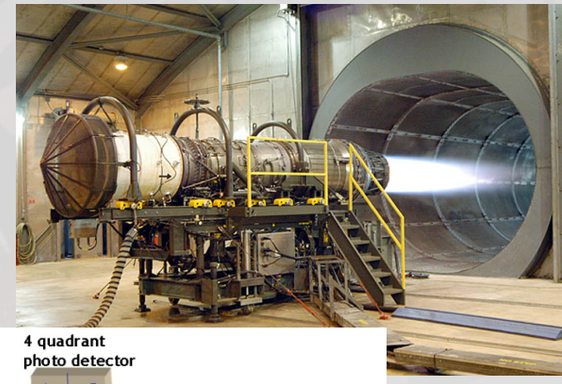
Mechanical Engineering

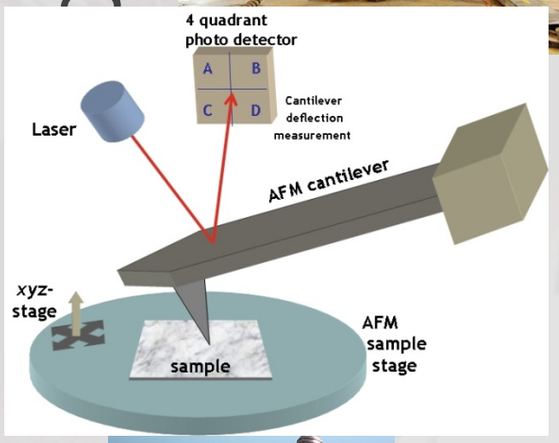
Systems that utilize power to accomplish a task that involves forces and movement

Mechanical Design, CAD

Statics and Strengths of Matls.

- Robotics
- Aerospace
- Micro/nanoscale engineering



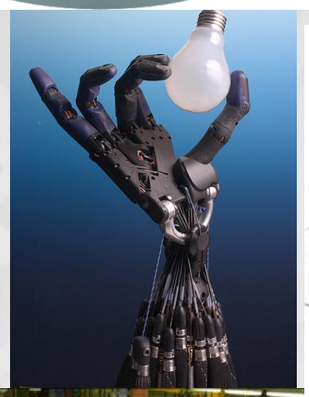


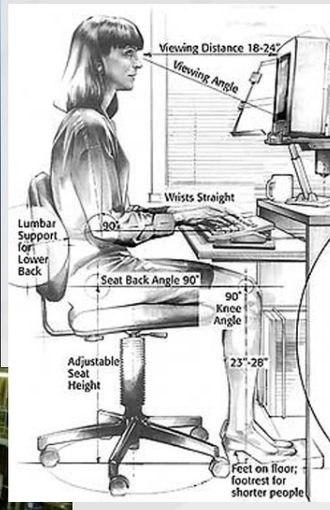
Manufacturing

Thermo-dynamics

Heat Transfer

- Biomechanics
- Ergonomics and safety

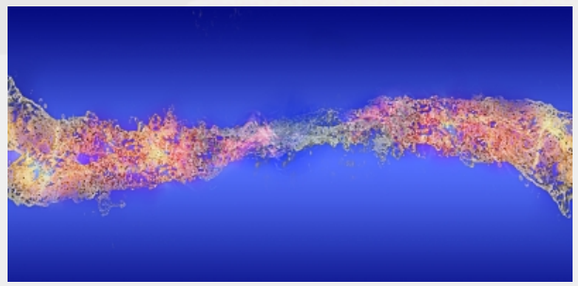




Design of Mechanical Elements

Fluid Mechanics

- Design and manufacturing
- Fluid mechanics



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School of Computing

Devices and instructions to calculate a set of outputs from a set of inputs

Object Oriented Programming

Algorithms

- Computer Engineer
- System Architect

Programming Structures

Organization

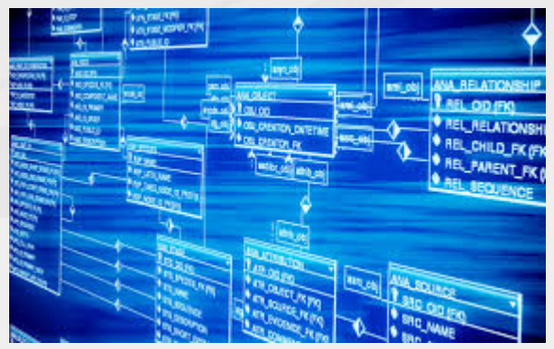
Systems

- Programmer (Applications, Games, Robotics, Web)

Scientific Computing

Animation

- Administrator (Database, Network)



Questions?