Engineering as a Career Choice

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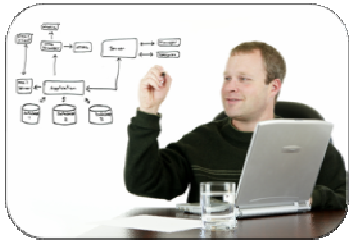
Mercer County Community College

What is engineering ?

Engineers apply math and science for the betterment of society through:



Design

Manufacturing

Research & Development

Management

Continual Improvement

Logistics

Above all, engineers are problem solvers who make things work better, more efficiently, quicker and cheaper.

Reference: Northeast Tennessee University

Engineering Disciplines

MAJOR DISCIPLINES:

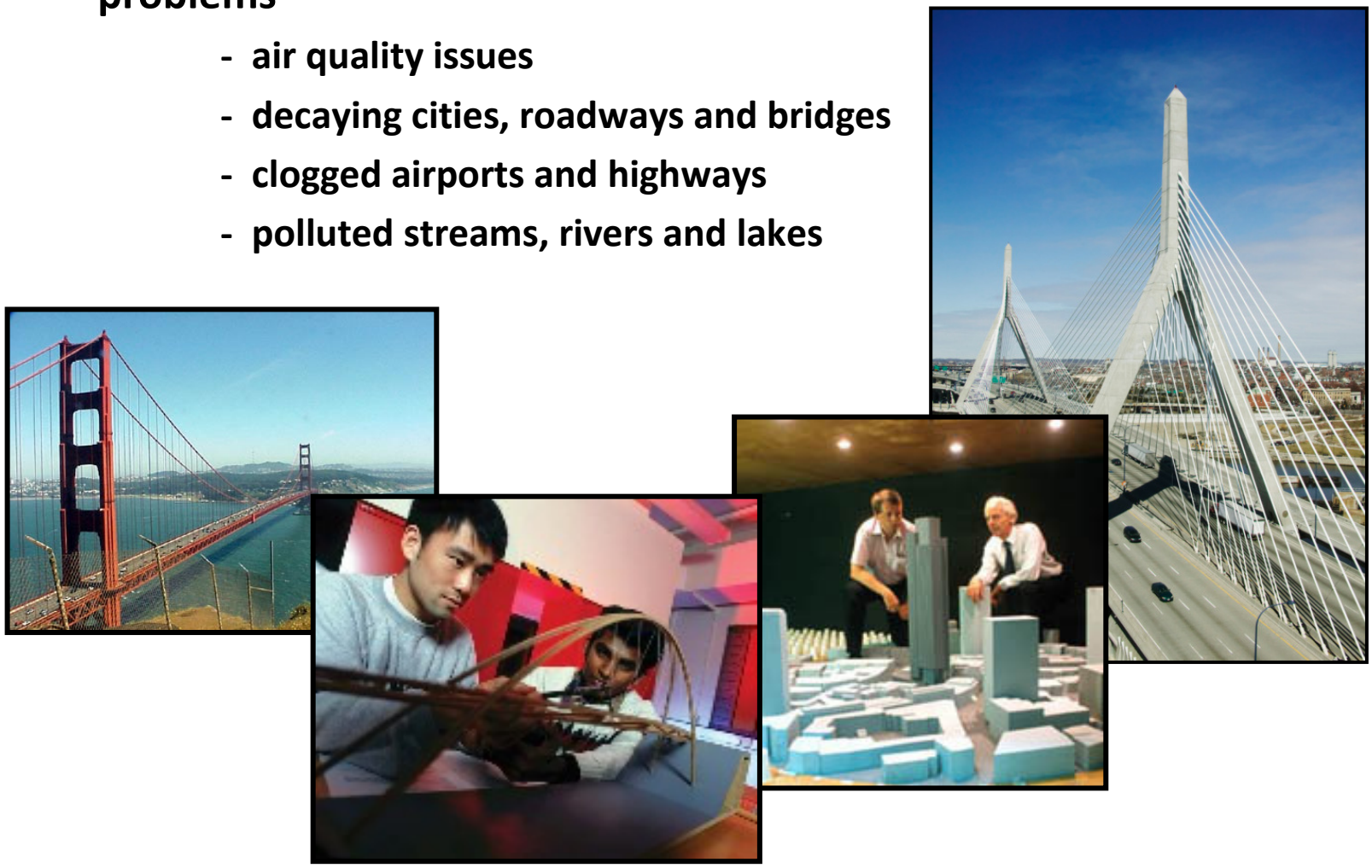
- Mechanical Engineering
- Electrical Engineering
- Chemical Engineering
- Civil Engineering
- Industrial Engineering

OTHER DISCIPLINES :

- Automotive Engineering
- Aerospace Engineering
- Agricultural Engineering
- Biomedical Engineering
- Computer Engineering
- Environmental Engineering
- Materials Engineering
- Nuclear Engineering
- Robotics Engineering
- Safety Engineering

Civil Engineering

- Design solutions to cope with many of our planet's most serious problems
  - air quality issues
  - decaying cities, roadways and bridges
  - clogged airports and highways
  - polluted streams, rivers and lakes



CONRAIL over New

Erie Drift-catcher, Erie, PA

HB-4 over Swimming River,

CONRAIL over NJ Transit,

Benjamin Franklin Bridge over the Delaware River

CONRAIL over Main Street, South Amboy, N.J.

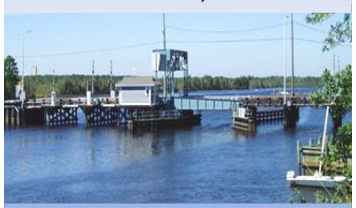
Riverside-Delanco Bridge, Riverside, N.J.

Macombs Dam over Harlem River, N.Y.

Norfolk Southern Coal Conveyor Bridge, Ashtabula, OH

HB-7 over Route 35, Colts Neck, N.J.

SEPTA Bridge, Jenkintown,



Green Bank Road over

Route 47 over Grassy

Burlington-Bristol Bridge

Eighth Street Bridge,

Long Bank Bridge, Long Bank, N.J.

Route 47 over CONRAIL, Franklin, N.J.

Pedricktown Bridge, Pedricktown, N.J.

Alexander Road over AMTRAK, Princeton Junction, N.J.

Route 73 over Route 70,

Mayor Aitken Drive Bridge, Bridgeton, N.J.

Route 49 over Alloway Creek, Quinton, N.J.

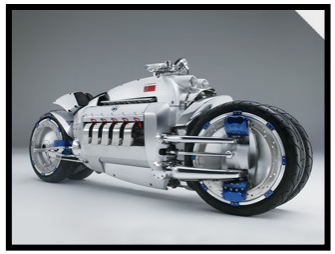
Route 49 over Salem River, Salem, N.J.

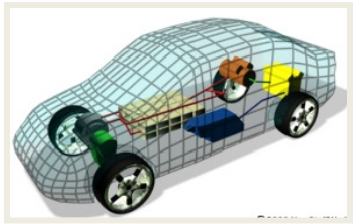
Route 44 Bridge, Deptford, N.J.

HB-10 over Route 36, Colts Neck, N.J.

Mechanical Engineering

- Perhaps the broadest of all the engineering disciplines in its range of activities
- Concerned with design, manufacture & operation of a wide range of components, devices, or systems:
  - microscopic parts (nanotechnology) to gigantic gears
    - heating, ventilation, refrigeration
    - manufacturing equipment (tanks, motors, pumps)
    - laser technology
    - biomedical applications
    - automotive industry
    - computer-aided design, automation, robotics

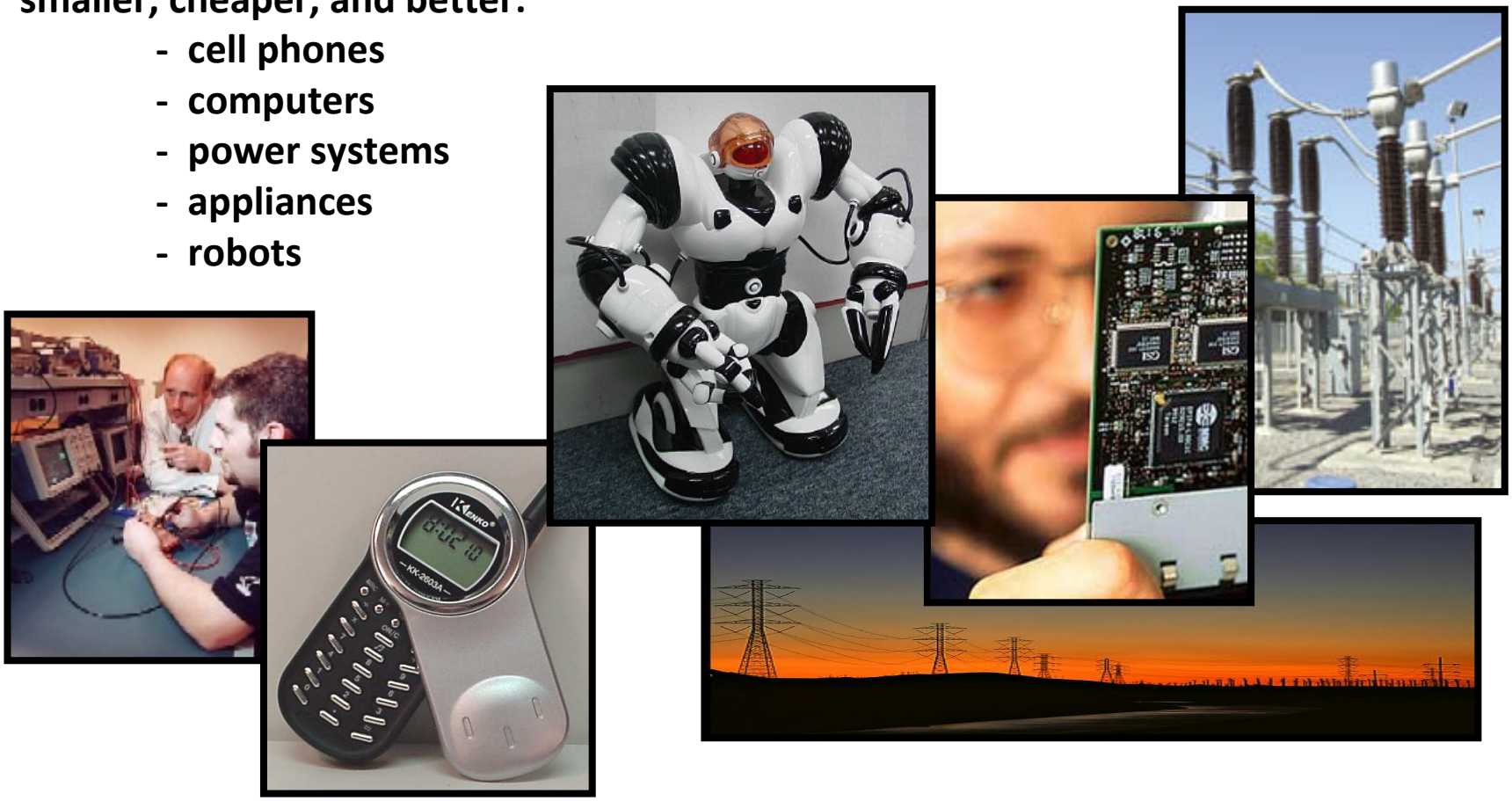




Electrical Engineering

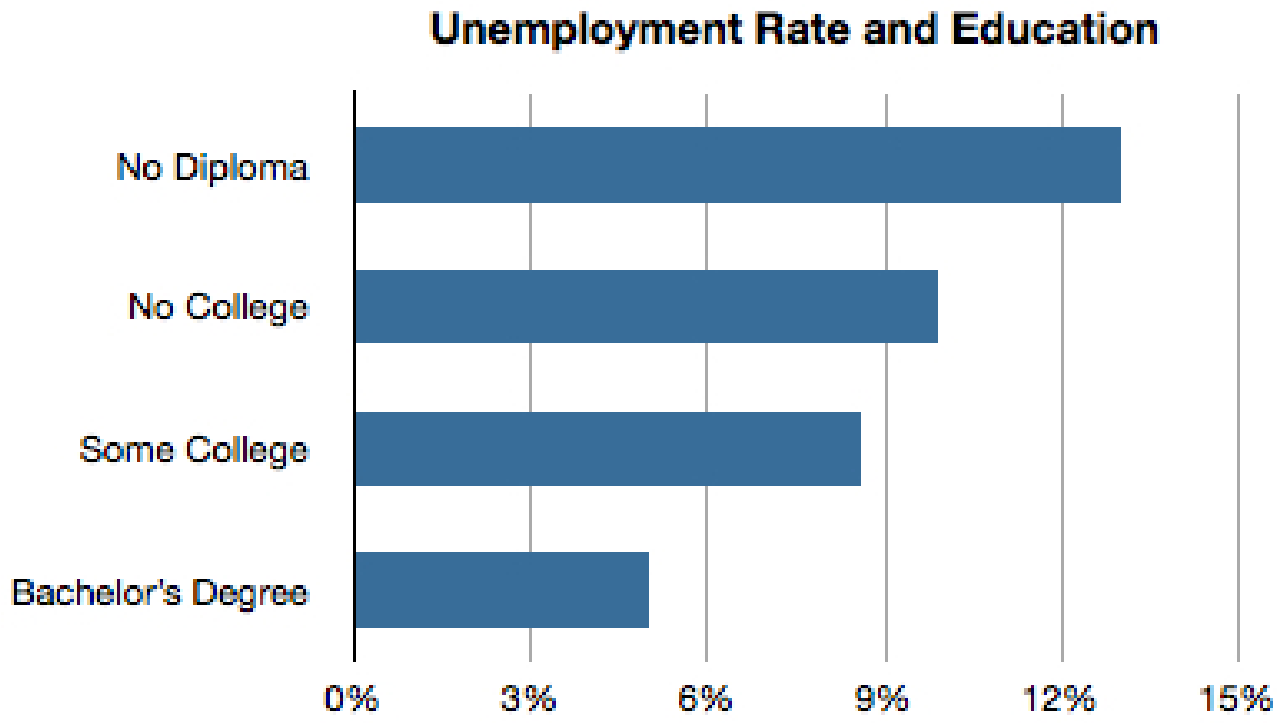
- **Apply specialized skill to the design, manufacture, application, installation, and operation of electrical products and systems.**

- **Play a role in almost EVERYTHING we interact with on a daily basis. They design smaller, cheaper, and better:**
  - **cell phones**
  - **computers**
  - **power systems**
  - **appliances**
  - **robots**



Career Preparation

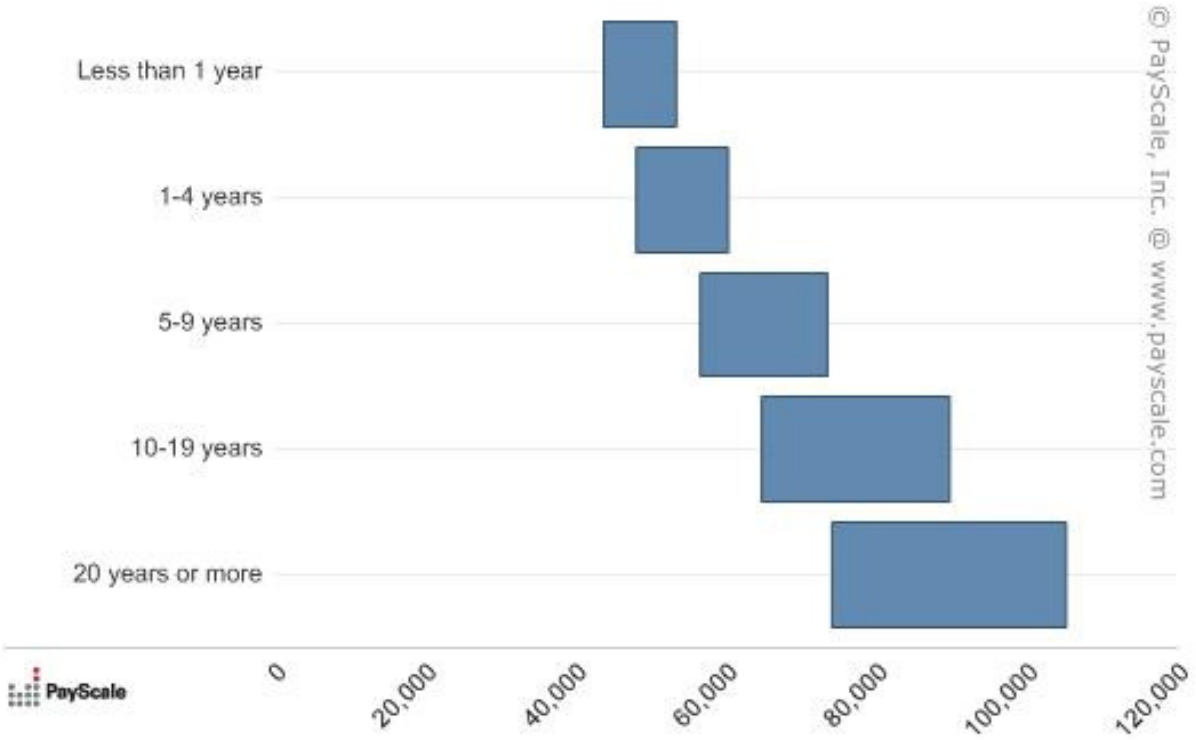
- Benefits of a College Degree



Reference: The Washington Post, "The benefits of a college degree in one graph," by Ezra Klein, August 11, 2010

Engineering as a Career Choice

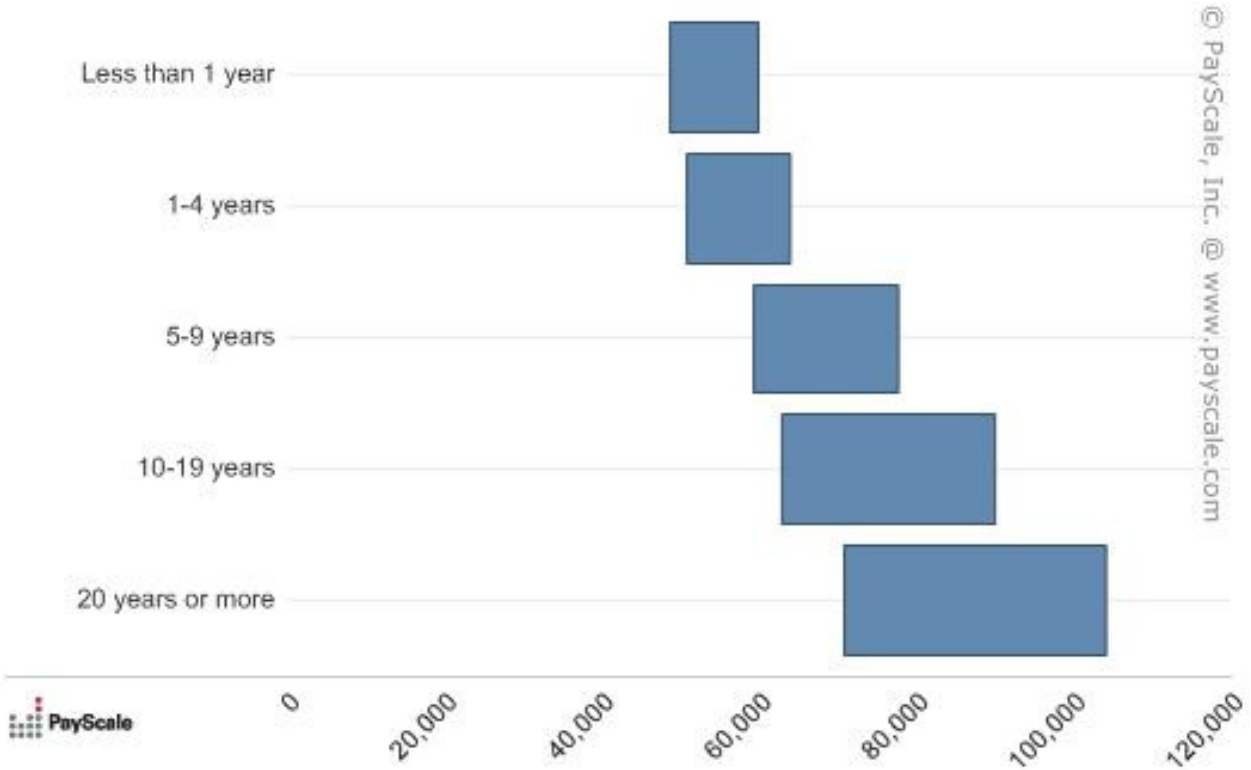
- Does Engineering Pay Well?
  - Civil Engineers



Reference: PayScale Inc.

Engineering as a Career Choice

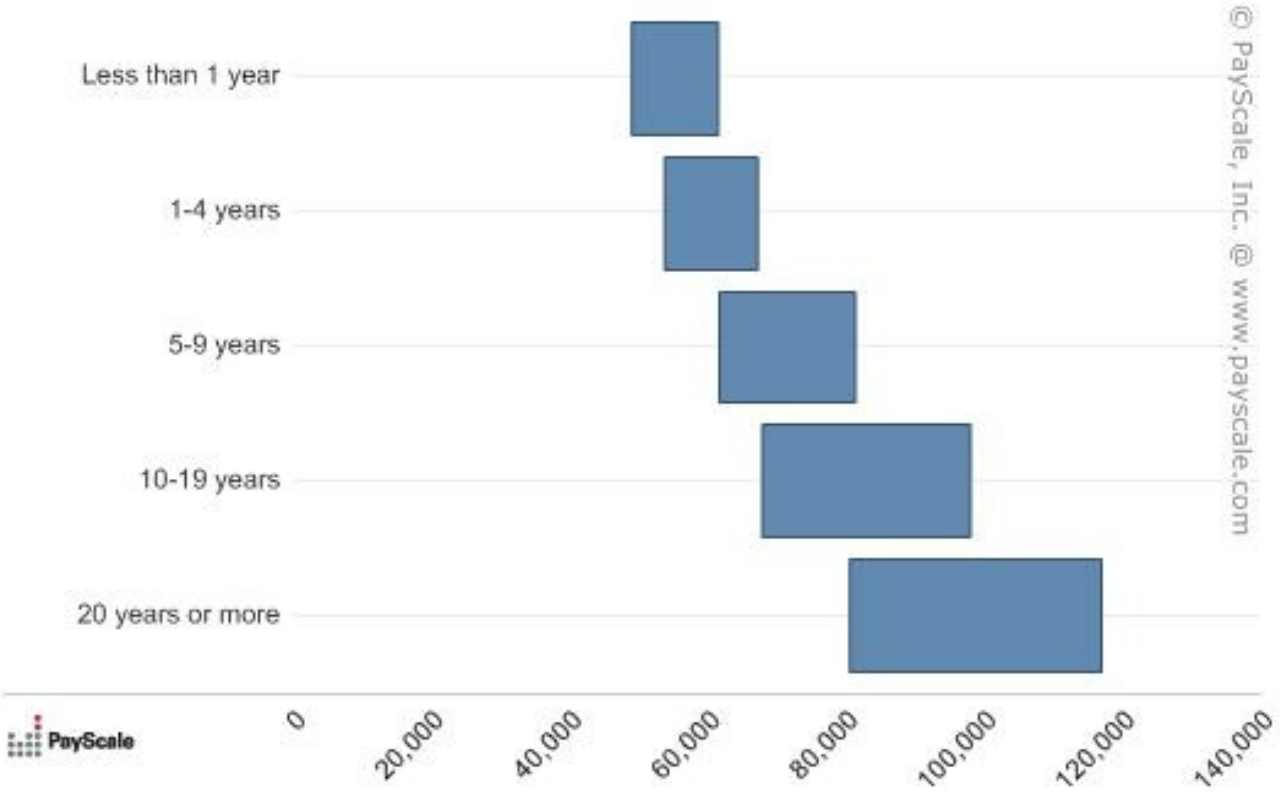
- Does Engineering Pay Well?
  - Mechanical Engineers



Reference: PayScale Inc.

Engineering as a Career Choice

- Does Engineering Pay Well?
  - Electrical Engineers



Reference: PayScale Inc.

Engineering as a Career Choice

- What is the Job Outlook?
  - Civil Engineers – **24% employment increase**
  - Mechanical Engineers – **6% employment increase**
  - Electrical Engineers – **2% employment increase**
  - Covering 2008-2018 period

Reference: US Dept. of Labor's Occupational Outlook Handbook

College Entrance

Courses to be Taken in High School	
Algebra I & II	Geometry
Trigonometry	Calculus
Physics	Chemistry
Computer Programming	Social Studies
Foreign Languages	Fine Arts/Humanities

Mercer County Community College Engineering Degree Programs

- A.S. in Engineering Science (Two Year Degree)
  - Designed to transfer into any University offering a Bachelor's Degree in Engineering
  - Allows transfer into any Engineering Discipline (Civil, Mechanical, Electrical, etc.)
  - University Level Math and Science (Calculus)

- A.A.S. in Civil Engineering Technology (Two Year Degree)
  - Designed to transfer into Universities offering a Bachelor's Degree in Engineering Technology
    - New Jersey Institute of Technology
    - Temple University
    - Fairleigh Dickinson University
    - Penn State University
  - College Level Math and Science (Algebra & Trigonometry)

Engineering Science

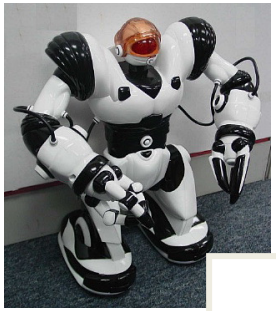
(A certificate option is also available)

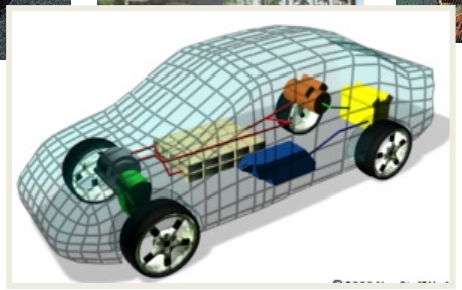
Curriculum

Code	Course (lecture/lab hours)	Credits
CHE 101	General Chemistry I (3/3)	4
CMN 112	Public Speaking (3/0)	3
ENG 101	English Composition I (3/0)	3
MAT 151	Calculus I (4/0)	4
PHY 115	University Physics I (3/3)	4
CHE 102	General Chemistry II (3/3)	4
CIV 103	Statics (3/0)	3
ENG 102	English Composition II (3/0)	3
MAT 152	Calculus II (4/0)	4
PHY 215	University Physics II (3/3)	4
CIV 230	Mechanics of Solids (3/3)	4
ECO 112	Microeconomics (3/0)	3
ENT 116	Engineering Graphics (1/2)	
	OR	2
DRA 190	Introduction to Computer-Aided Drafting (1/2)	
MAT 251	Calculus III (4/0)	4
PHY 225	University Physics III (3/3)	4
COS 101	Introduction to Computer Science (3/2)	4
MAT 252	Differential Equations (4/0)	4
— —	General Education elective[1]	3
— —	General Education elective[1]	3
		67

NOTE: Select courses in consultation with an academic advisor in order to assure maximum transfer of credits.

[1] Select courses from either Humanities or Historical Perspective general education categories.





Careers:

The Engineering Science program prepares students to transfer to a baccalaureate degree in Engineering. Students develop a strong foundation in mathematics, physics, and chemistry, with emphasis on engineering applications and use of the computer as a problem-solving tool. *Can lead to licensure as a Professional Engineer.*

Transfer Information:

Students can transfer to a four-year ABET-accredited engineering program with majors such as civil, computer, electrical, industrial, mechanical, biomedical, chemical, environmental, or architectural engineering.

Articulation Agreements:

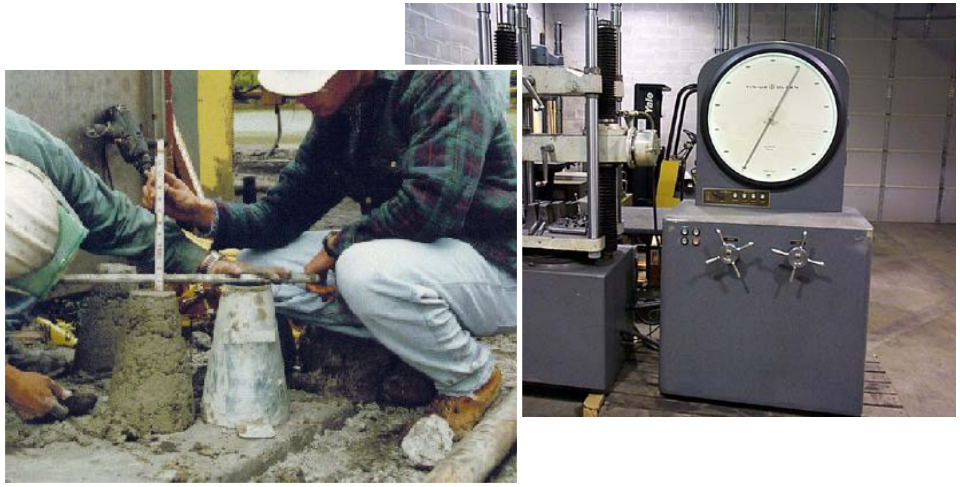
Mercer currently has articulation agreements with Rowan University, New Jersey Institute of Technology (NJIT), The College of New Jersey, Drexel University, and Rutgers University.

Civil Engineering Technology

Curriculum

Code	Course (lecture/lab hours)	Credits
CIV 101	Surveying I (2/3)	3
ENT 116	Engineering Graphics (1/2)	2
DRA 190	Introduction to Computer-Aided Drafting (1/2)	2
ENG 101	English Composition I (3/0)	3
MAT —	Mathematics elective (3/0)[1]	3-4
— —	Science elective[2]	3
CIV 102	Surveying II (2/3)	3
CIV 106	Mechanics (3/0)	3
ENG 112	English Composition II With Speech (3/0)	3
MAT —	Mathematics elective (3/0)[1]	3-4
— —	Science elective[2]	3
CIV 223	Fluid Mechanics (3/3)	4
CIV 227	Structural Steel Design (2/3)	3
CIV 229	Mechanics of Materials (3/3)	4
— —	General Education elective[3]	3
— —	General Education elective[4]	3
CIV 228	Reinforced Concrete Design (2/3)	3
CIV 216	Highway Engineering (2/2)	3
HPE 110	Concepts of Health and Fitness (1/2)†	2
IST 102	Computer Concepts with Programming (2/2) OR	3
IST 109	Introduction to Programming (2/2)	
— —	Technical elective[5]	2
— —	General Education elective[4]	3
		64-66

NOTE: Electives should be selected in consultation with an academic advisor in order to assure maximum transfer of credits.



Careers:

Prepares students for employment in field and office positions with architects, engineers, and government agencies as engineering aides; construction, highway or materials technicians; transit operators; or estimators. *Also can lead to licensure as a Professional Civil Engineer.*

Transfer Information:

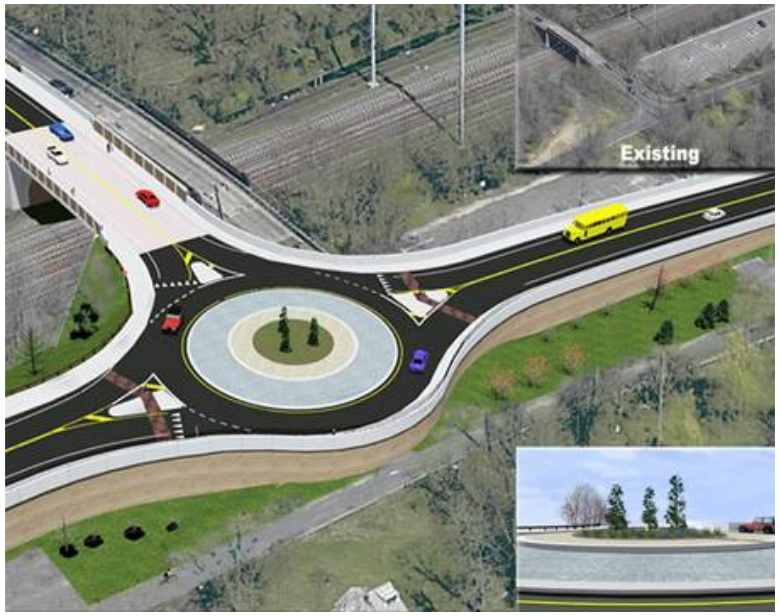
Graduates wishing to pursue studies leading to a bachelor's degree can transfer into the junior year at many institutions. Temple University, New Jersey Institute of Technology (NJIT), Pennsylvania State University, and Fairleigh Dickinson University are among the institutions accepting Mercer graduates.

Articulation Agreements:

Mercer currently has an articulation agreement with Fairleigh Dickinson University, and has agreements pending with Temple University, New Jersey Institute of Technology (NJIT), and Pennsylvania State University.

Field Trips

Route 36 Highlands Bridge



Alexander Road Bridge

Field Trips

Lab Equipment

Lab Equipment

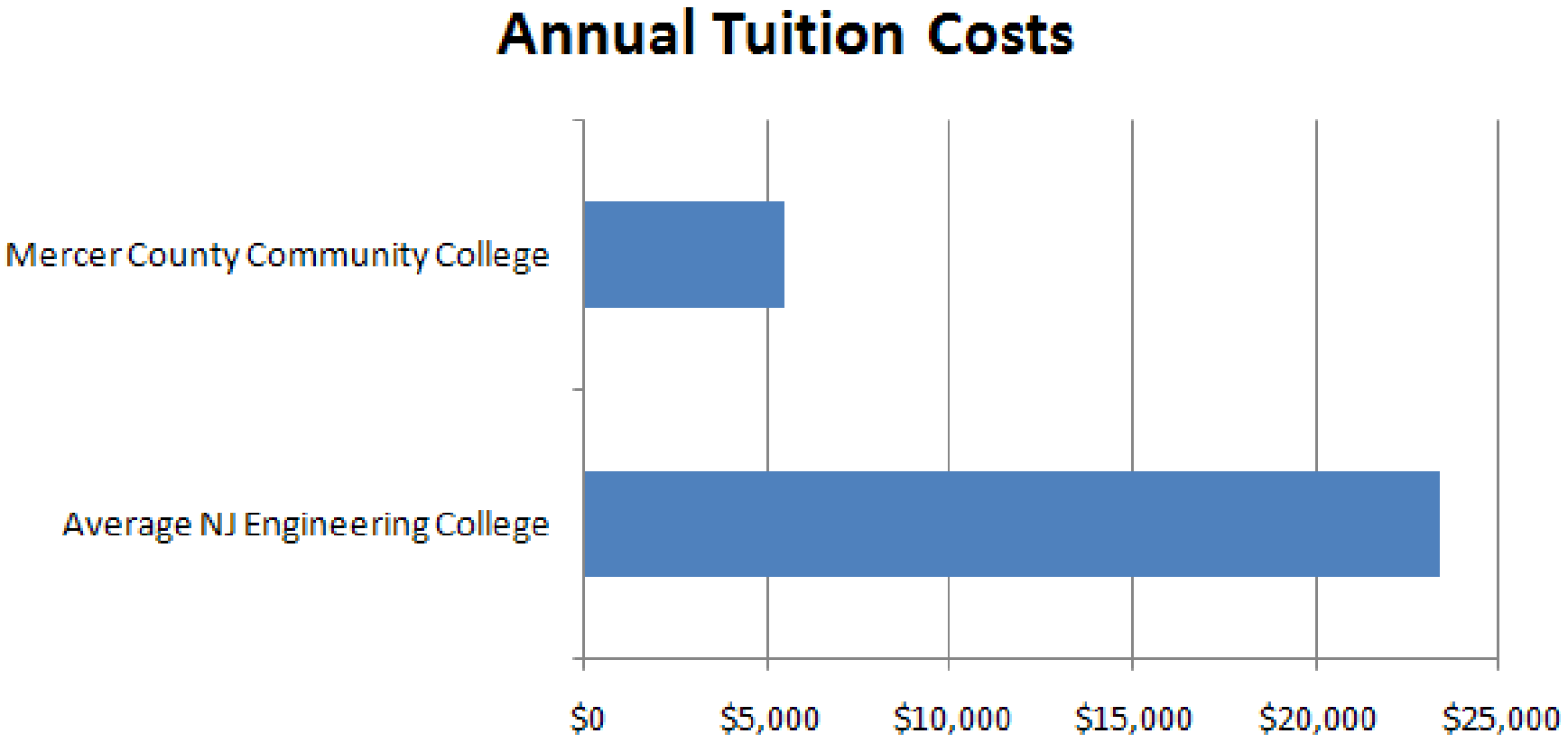
Engineering versus Engineering Technology

Program	Engineering	Engineering Technology
Associate Degree	Associate in Science	Associate in Applied Science
	⇩	⇩
Bachelor's Degree	B.S. Engineering	B.S. Engineering Technology
	Any University offering a Bachelor of Science in Engineering	University offering a Bachelor of Science in Engineering Technology
	⇩	⇩
Engineering Exam 1	E.I.T. Exam	E.I.T. Exam
Work Experience	4 Years Experience under supervision of Professional Engineer	6 Years Experience under supervision of Professional Engineer
Engineering Exam 2	P.E. Exam	P.E. Exam
Professional Engineer	Professional Engineer	Professional Engineer

Professional Engineers and Land Surveyors Laws. (2011). Retrieved from http://www.state.nj.us/lps/ca/laws/engineers_law.pdf

Community College Cost Savings

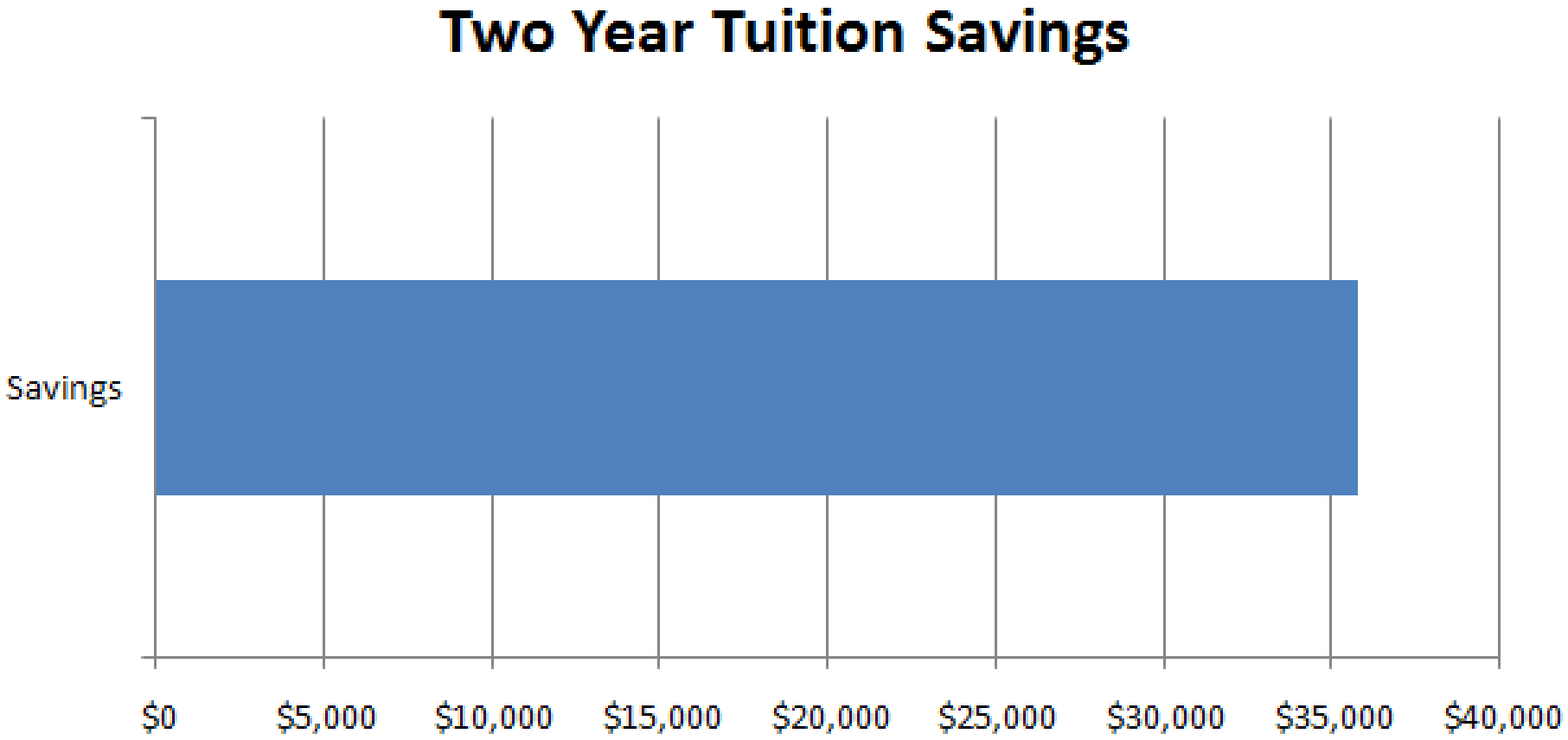
- Average NJ Annual Tuition for Engineering Colleges = $23,400
- Average Annual Tuition for Mercer County Community College = $5,500



Reference: American-school-search.com

Community College Cost Savings

- Two-year savings by attending Mercer County Community College = $35,800



Reference: American-school-search.com

Contact Information

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