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Introduction to the

Civil Engineering Program

August 19, 2016

Presentation by Dr. W. Wright

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Civil Engineering Program

I. The Profession of Civil Engineering
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I. Civil Engineering Profession

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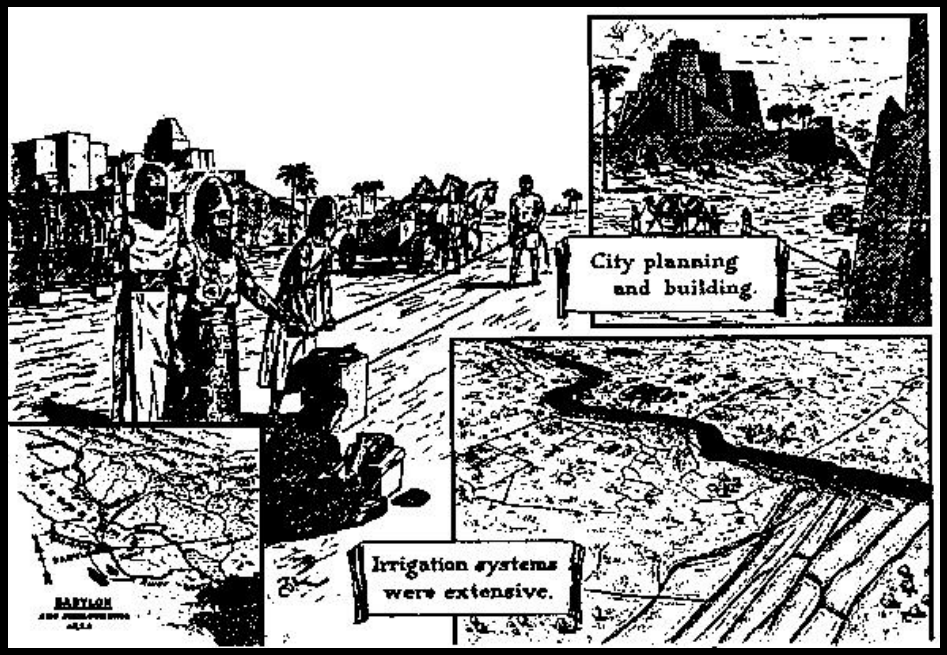
Civil Engineering Profession

One of the oldest Engineering Professions



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US Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook Description of:

Civil Engineering → **Link**

Environmental Engineering → **Link**

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Civil Engineering Profession

https://www.youtube.com/watch?v=LTXPQM8S4Ss

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II. Technical Specialties/Areas in Civil Engineering

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Civil Engineering Emphasis:

Structural Engineering

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Civil Engineering Emphasis

Structural Engineering

Avenue 416 Bridge over Kings River, County of Tulare, California
ASCE Region 9 Structural Project of the Year, 2014
Photo Credit: Cornerstone Engineering

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Civil Engineering Emphasis:

Transportation Engineering

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Civil Engineering Emphasis:

Transportation Engineering

State Route 198/Plaza Drive Interchange in Visalia, California
ASCE Region 9 Large Project of the Year, 2014
Photo Credit: TRC Solutions

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Civil Engineering Emphasis:

Geotechnical Engineering

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Civil Engineering Emphasis:

Geotechnical Engineering

Fresno Chaffee Zoo African Adventure
ASCE Region 9 Geotechnical Project of the Year, 2014
Photo Credit: Moore Twining Associates

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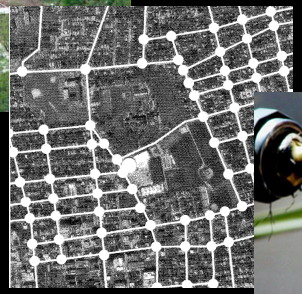
Civil Engineering Emphasis:

Water Resource Engineering



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Civil Engineering Emphasis:

Water Resource Engineering

Grundfos Water Conservation/Recovery Project
ASCE Region 9 Small Project of the Year, 2014
Photo Credit: Yamabe & Horn Engineering

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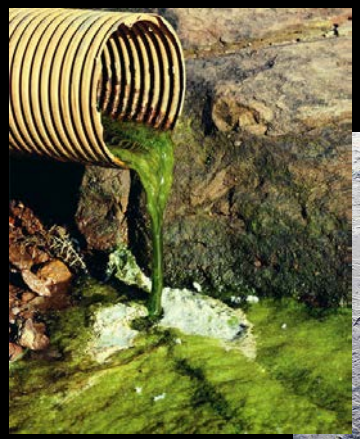
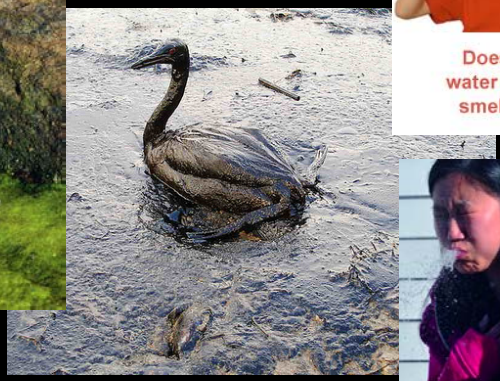
Civil Engineering Emphasis:

Environmental Engineering





<u>Objective</u>: To attain or maintain a high quality physical environment

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Civil Engineering Emphasis:

Environmental Engineering

B-6 Dairy Wastewater Retention Ponds, Hilmar, California
ASCE Region 9 Wastewater Project of the Year, 2014
Photo Credit: Sousa Engineering

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EDUCATION FEBRUARY 13, 2015 2:57 PM

Fresno State research: Leftover food gets new life as bioplastic

HIGHLIGHTS

A Fresno State researcher is turning food waste from a local fruit producer into biodegradable plastic.

1 of 9

By Hannah Furfaro · The Fresno Bee

Fresno State researcher Bill Wright pulls bags of frozen, mushy strawberries out of his lab freezer. He's converting the pink food waste into an unexpected consumer product: plastic.

In his small lab space in a campus engineering building, silvery trays filled with dark powder share cluttered space on tables with a spectrophotometer that measures light, a centrifuge and other equipment. Graduate student Michael Nunes, the lab manager, stirs fermented fruit stewing in buckets painted with the slogan "Let's do this" — a fitting message for the researchers, who have worked tirelessly to convert waste from fruit, nuts and other food into biodegradable plastic.

Feathery pieces of the stuff sit in glass test tubes. The opaque, delicate-looking plastic can be turned into water-resistant plastic pellets, melted down into molds, and shaped into forks and spoons, composting bags and plant pots.

It's a fresh take on the concept of reuse, recycle. And one that makes a lot of sense in the food-producing central San Joaquin Valley, Wright said.

"An incredible amount of food is grown in this fertile valley and not all of it makes it to the dinner table. There's quite a bit that ends up being a burden," Wright said. "We look at it as a resource."

For nearly two years Wright has led the research on behalf of a start-up called Full Cycle Bioplastics, an eco-friendly company started by two brothers that's looking to commercialize an affordable plastic made from food waste. The company has donated $112,000 to fund the project, Wright said.

In a year when plastic is being shunned in California — plastic shopping bags could disappear from many stores by summer — and floating islands of debris in the Pacific are catching international headlines, once-niche bioplastics are carving out a bigger corner of a market still dominated by petroleum-based plastic.

Commercial production of various bioplastics has been churning for decades. But Wright and his research team are taking a new approach. Instead of more popular methods, like growing corn or soybeans to use in the conversion process, they're using food scraps, like peach pits and fruit slurry.

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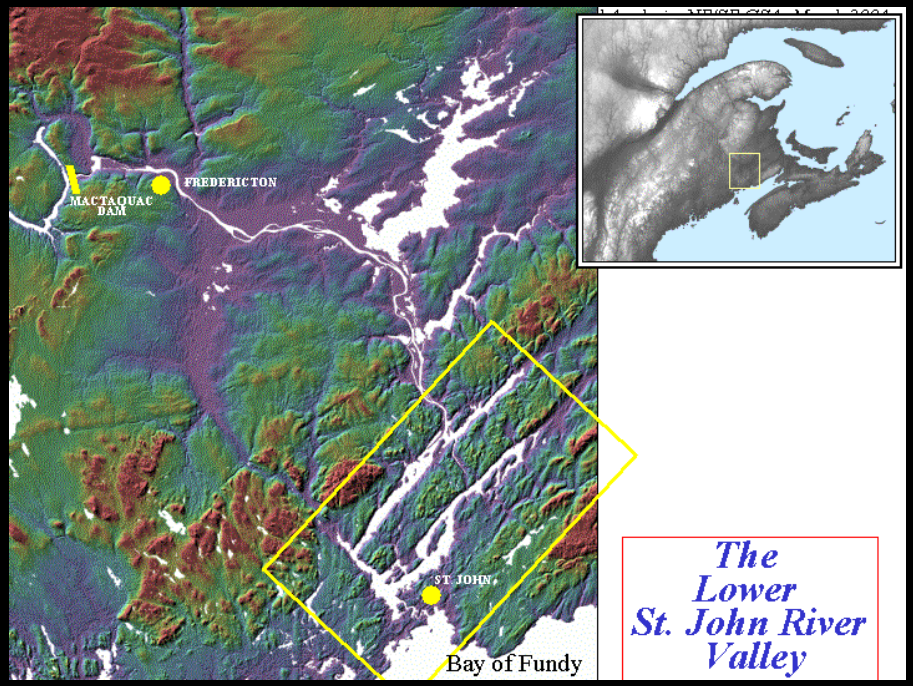
Geomatics Engineering Emphasis:

Measuring and mapping the earth and the built infrastructure



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III. MSCE Programs and Goals

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Programs

Master of Science in Civil Engineering

Option in Water Resources & Environmental Engineering

Accelerated BS-MS

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Program Goals

To prepare students for:

- professional practice

- advanced study beyond the master's degree

What degree is beyond the master's?

Graduate Plans of Study

The M.S. in Civil Engineering requires the completion of **30 units** following one of three programs of study.

Plan A (Thesis)

a. 200-series CE courses (12-24 units)
b. 100-series CE or GME technical area courses (0-6 units)
c. Courses outside the department (0-6 units)
d. Thesis (6 units)

The work performed as part of the thesis:

- is original
- contributes to the advancement of engineering science or engineering practice.
- is of a quality and novelty worth to be published in a professional technical journal.
- is reported in a Final Thesis Report and is defended orally.

Graduate Plans of Study

The M.S. in Civil Engineering requires the completion of **30 units** following one of three programs of study.

Plan B (Project)

a. 200-series CE courses (15-27 units)
b. 100-series CE or GME technical area courses (0-6 units)
c. Courses outside the department (0-6 units)
d. Project (3 units)

The work performed as part of the Project:

- must show evidence of originality, organization, clarity of purpose, critical analysis, accuracy, completeness, and quality of writing consisting with the standards appropriate for publication in the scholarly journals of the field.
- is reported in a Final Project Report and is defended orally.

Graduate Plans of Study

The M.S. in Civil Engineering requires the completion of **30 units** following one of three programs of study.

Plan C (Comprehensive Exam)

a. 200-series CE courses (18-30 units)
b. 100-series CE or GME technical area courses (0-6 units)
c. Courses outside the department (0-6 units)

The work performed as part of the comprehensive exam:

- Evidences the student's ability to:
  1. integrate the knowledge of the area
  2. show critical and independent thinking, appropriate organization, and
  3. demonstrate mastery of the subject matter.
- Determines if the candidate is able to use the content of his/her courses in applications that are not explicitly presented in the classroom but are the immediate and natural application of the classroom subjects.

A minimum overall score of 75-percent on the entire exam is required to pass the exam. The exam can be retaken only once and failure to pass the exam the second time will result in the student being disqualified and dismissed from the MSCE Program.

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Water Resources & Environmental Engineering (WREE) Option

1. **Core Courses:** CE 210, 240, 241, and 242;
2. 6 units of 100 or 200-series courses outside of the program*, excluding EES 267, and including 3 units in business or public administration;
3. Remaining units from CE 140, 141, 144, 146, 191T*, 206, 245, 246A, 246B, 247, 290, 291T*, and 298, 299 (max 6 units from 100 series).

* Must be WREE-related and approved by the Graduate Program Coordinator.

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- Seats are reserved for graduate students; you may need a permission number.
- You also may need to have prerequisite courses waived. See Dr. Wright.

	Tech. Elective Courses *(Tentative)*		Fall 16	Spr 17
→	CE 125	Geotechnical Engineering Design	X	X
	CE 131	Intermediate Analysis of Structures		
→	CE 134	Foundation Design	X	X
→	CE 136	Design of Timber Structures	X	
	CE 137	Seismic Analysis of Building Structures		X
	CE 191T/138	Design of Cold-Formed Steel Structures		
	CE 140	Hydrology		
→	CE 141	Water Resources Engineering	X	
	CE 144	Des. of Water Quality Control Processes		
	CE 146	Urban Stormwater Management		X
	CE 191T	Design of Wastewater Mngmt Syst.		X
→	CE 151	Pavement Design	X	
	CE 152	Transportation Engineering Materials		X
	CE 153	Traffic Operations and Control		
→	CE 191T	Sustainable Transportation Systems	X	
	CE 191T	Transportation GIS		
	CE 191T	Urban Transit Systems Design		
	CE 191T/165	Sustainable Agricultural Infrastructure		X
	CE 191T/188	CE Entrep (New Name)		

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Graduate Courses (*Tentative*)		Fall 16	Spr 17
CE 205	Computing in Eng Analysis		X
CE 206	Engr Env. Impact		
CE 291T/208	Sust. Practices in Civil Eng.		
CE 210	Research Methods	X	
CE 223	Adv Soil Mechnics		
CE 225	Num Meth in Geot Engr	X	
CE 245	GeoEnv. Eng		
CE 291T	Reliab Meth Geot & Struc Engr		X
CE 230	Adv Theory of Struc		X
CE 232	Prestressed Conc		
CE 233	Adv Steel	X	
CE 236	Reinf Mansr. Theory		
CE 237	Dyn. Of Struct.		
CE 238	Stab. of Structures (formerly CE291T)		
CE 239	Adv Reinf Conc		
CE 240	Engr. Hydrology	*Sabbatical*	X
CE 241	Contaminant Transport & Fate	*Sabbatical*	
CE 242	Urban & Industrial Water Systems		X
CE246A	Adv Water Qual		
CE 246B	Adv Water Qual		
CE 291T	Water Resources Systems Optimization	X	
CE 291T	Transportation Systems Planning	X	
CE 291T	Engineering Data Models and Analytics		
CE 291T	Urban Transit Systems		

V. Faculty in the Civil Engineering Program

Civil Engineering Program Faculty

Dr. J. Larralde, P.E.
Associate Dean, LCOE
Transportation & Materials Engr.
Purdue, 1984

Dr. Ching Choo
Undergrad. Program Coordinator
Structural Engineering
University of Kentucky, 2005

Dr. Fariborz Tehrani, P.E.
Structural Engineering
UC Los Angeles, 2008

Dr. Aly Tawfik
Transportation Engineering
Virginia Tech University, 2012

Dr. Arezoo Sadrinezhad
Geotechnical Engr..
The University of Akron, 2014

Dr. Kimberly Stillmaker
Structural Engineering
UC Davis, 2016

Dr. William Wright, P.E.
Grad. Program Coordinator
Envir. & Hydraulics Engr.
U.C. Davis, 2000

Dr. Lubo Liu, P.E.
Hydrologic & Hydraulics Engr.
University of South Carolina, 2003

Dr. Fayzul Pasha, P.E.
Water Resources Engineering
University of Arizona, 2006

Dr. Lalita Oka
Geotechnical Engr..
University of Vermont, 2012

Dr. Maryam Nazari
Structural Engineering
Iowa State University, 2016

Dr. Xlaojun Li
Transportation Engineering

Geomatics Engineering Program Faculty

Slide is under construction.

Riadh Munjy, Ph.D, P.E.
GME Program Coordinator; CGE Dept. Chair
Prof., Photogrammetry

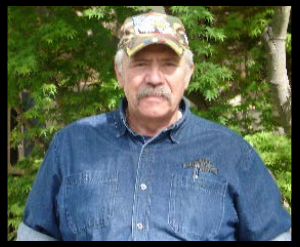
Mustafa "Mike" Berber, Ph.D, P.E.
Geomatics Engineering;

James K. Crossfield, L.S., Ph.D
Geomatics Engineering (Spring only)

Fareed Nader, Ph.D
Land Surv. & Catastral Surv. (Emeritus)

Scott Peterson, PLS
Land Surv.

Civil Engineering Program Staff



Steve Scherer
Department Technician

Beneves Chavez
Administrative Support Coordinator

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VI. Paying for Graduate School

Paying for Graduate School

Scholarships, Fellowships and Grants:

Scholarship, fellowship and employment opportunities are available through various entities campus.

Information is available at the following Internet sites:

http://www.fresnostate.edu/academics/graduatenet/students/financial-aid.html

http://www.fresnostate.edu/academics/gradstudies/financial/

http://www.fresnostate.edu/academics/gradstudies/financial/financialopportunitiesdgs.html

http://fresnostate.edu/studentaffairs/financialaid/grants-loans/index.html

Paying for Graduate School

On-Campus employment:

LCOE:

Financial opportunities within our college include instructional assistant (graders), teacher assistants, and research assistant positions.

Occasionally we hire graduate students can teach lab sections. These students are recruited by faculty based on observation of student performance in courses and on their perceived skills.

Paying for Graduate School

Off-campus employment:

There are numerous off-campus internships and full-time positions that come to our attention on a regular basis. We notify students of these opportunities via email.

LCOE Job placement program in our college: Pathways
http://www.fresnostate.edu/engineering/jobs/pathwaysjobs/index.html

Some employers will pay part of the tuition.

VII. Forbes 15 most Valuable College Majors

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Forbes

www.forbes.com/sites/jennagoudreau/2012/05/15/best-top-most-valuable-college-majors-degrees/

The 15 Most Valuable College Majors

…Engineering concentrations comprise one third of the most valuable majors.

- Software engineering majors (No. 4) earn a median of $87,800 after 10 years on the job;
- environmental engineering majors (No. 5) earn a median of $88,600;
- civil engineering majors (No. 6) earn a median of $90,200; and
- petroleum engineering majors (No. 9) earn a median of $155,000—the highest paycheck on the list.

"These aren't majors that anyone could do. They're hard, and these programs weed people out," says Bardaro. "However, there is high demand for them and a low supply of people with the skills, so it drives up the labor market price."

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Forbes

www.forbes.com/sites/jennagoudreau/2012/05/15/best-top-most-valuable-college-majors-degrees/

The 15 Most Valuable College Majors

In the Millennial Branding survey, employers reported engineering and computer information systems majors as their top recruits.

Also, nearly half of these employers (47%) said the competition for new science, technology, engineering and math talent is steep. That means while other recent grads fight for jobs, these students will likely field multiple offers.

VIII. ASCE Raise the Bar

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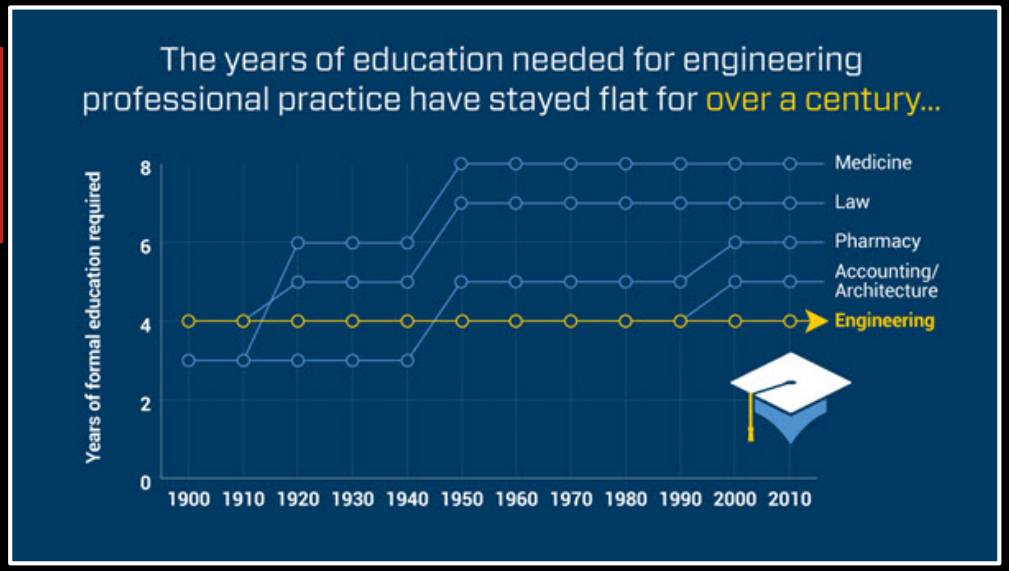

ASCE's The Vision for Civil Engineers in 2025: In order to keep pace with new technologies and rapidly changing current practices, …….

ASCE is currently considering requiring all those who would like to become civil engineering professionals to complete a master's degree in civil engineering.

ASCE Raise The Bar Video
https://www.youtube.com/watch?v=bBjayYd5gNg

VIII. Financial Value

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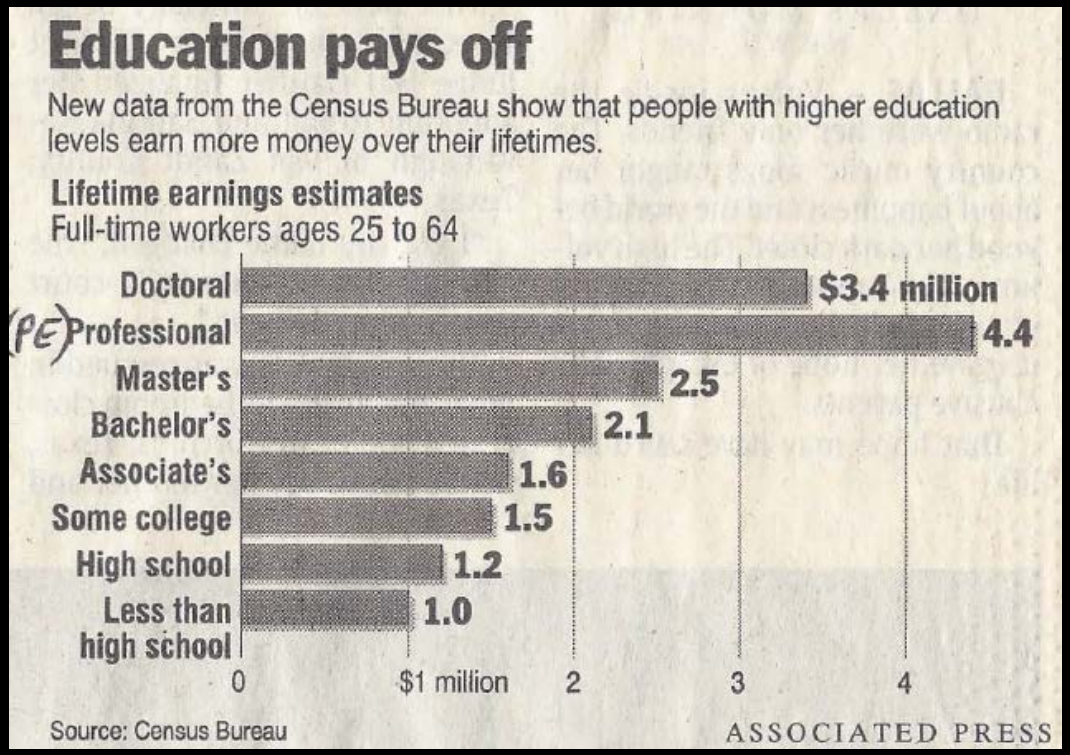
What the job market will pay

College graduates cash in over lifetime, study says*.



"The challenge is to convince those high school students on the margins is that it is really worth their time to go to college."

Jacqueline King, policy analyst with the American Council on Education, an advocacy group

"The time commitment is significant, but most people do find it worth it. They go to every single class, and they are trying to get the most out of their own dollar."

Kevin Malecek, graduate student in American politics at American University in Washington.

* The Fresno Bee, July 18, 2002

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Civil Engineering Graduate Program

THE VALUE OF A GRADUATE MASTER'S DEGREE

Getting a master's degree has a definite payoff in terms of income, according to a 2003 report by the American Council on Education's Division of Policy Analysis and Research. The report *(Building a Nation of Learners)* indicates that over an 8-year period (1990-98), workers with a master's degree earned $100,000 more than workers with a bachelor's degree and that the average monthly income for someone with a master's degree was $1,000 more than for an individual with a bachelor's degree. Furthermore, the National Center for Educational Statistics found that 98 percent of master's degree recipients were employed within a year after completing their degrees. Future enrollment projections indicate that even more students will be seeking the master's degree for professional enhancement/career advancement and that these students will need some form of financial support.

Source: Fresno State Division of Graduate Studies "Sourcebook" (2013)

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Civil Engineering Graduate Program

A graduate degree in Civil Engineering can:

- significantly increase your technical background to help you meet job requirements and do better work with new knowledge/ skills;
- provide you the opportunity to do really interesting work, including, an opportunity to conduct research and publish a thesis;
- provide you with more career options;
- distinguish you from peers and make you more competitive/ viable for promotion;
- Increase your pay.

VIII. Required Reading

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Civil Engineering Graduate Program

Required Reading:

1. **MSCE Graduate Student Handbook**: Remember to detach, sign and submit the form located at the end of the Handbook.
2. "A Guidance Manual on the Preparation of Technical Reports, Papers, and Presentations," Revised 2nd Ed. G. Tchobanoglous and Harold Leverenz (2013).
3. "Professional Skill: Communication," by Tony Akel

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Civil Engineering Profession

Another movie trailer: Link

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Civil Engineering Graduate Program

Questions?

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Civil Engineering Graduate Program

For more information contact the Graduate Program Coordinator, Dr. William Wright

wfwright@csufresno.edu

(559) 278-5591