Civil Engineering Program

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I. Civil Engineering Profession
Civil Engineering Profession

One of the oldest Engineering Professions
US Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook Description of:

Civil Engineering ➔ Link

Environmental Engineering ➔ Link
Civil Engineering Profession

https://www.youtube.com/watch?v=LTXPQM8S4Ss
II. Technical Specialties/Areas in Civil Engineering
Civil Engineering Emphasis:

*Structural Engineering*
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
Civil Engineering Emphasis: 
Transportation Engineering
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
Civil Engineering Emphasis:

Geotechnical Engineering
Civil Engineering Emphasis:

Geotechnical Engineering

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

Water Resource Engineering
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
Civil Engineering Emphasis: 

*Environmental Engineering*

**Objective:** To attain or maintain a high quality physical environment
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
Fresno State research: Leftover food gets new life as bioplastic

By Hannah Parish - 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, bribery traps filled with dry powder share crowded space on tables with a spectrophotometer that measures light, a centrifuge and other equipment. Graduate student Michael Jones, the lab manager, sits fermented fruit sitting in baskets painted with the slogan “Let’s do this!” — a fitting message for the researchers, who have worked tirelessly to convert waste from fruit, mix and other food into biodegradable plastic.

Fragrant pieces of the stuff sit in glass test tubes. The opaque, delicate-looking plastic can be turned into water-resistant plastic pellets, molded down into molds, and shaped into frisbees 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.

“A tremendous 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 $117,000 to fund the project, Wright said.

In a year when plastic is being banned in California — plastic shopping bags could disappear from many stores by summer — and floating islands of debris in the Pacific are catching international headlines, one 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 syrup.
Geomatics Engineering Emphasis:
Measuring and mapping the earth and the built infrastructure
III. MSCE Programs and Goals
Programs

Master of Science in Civil Engineering
Option in Water Resources & Environmental Engineering
Accelerated BS-MS
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.
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.
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;


* Must be WREE-related and approved by the Graduate Program Coordinator.
<table>
<thead>
<tr>
<th>Tech. Elective Courses</th>
<th>Fall 16</th>
<th>Spr 17</th>
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<tbody>
<tr>
<td>CE 125 Geotechnical Engineering Design</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CE 131 Intermediate Analysis of Structures</td>
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<tr>
<td>CE 134 Foundation Design</td>
<td>X</td>
<td>X</td>
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<tr>
<td>CE 136 Design of Timber Structures</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 137 Seismic Analysis of Building Structures</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 191T/138 Design of Cold-Formed Steel Structures</td>
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<tr>
<td>CE 140 Hydrology</td>
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<tr>
<td>CE 141 Water Resources Engineering</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 144 Des. of Water Quality Control Processes</td>
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<tr>
<td>CE 146 Urban Stormwater Management</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 191T Design of Wastewater Mngmt Syst.</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 151 Pavement Design</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 152 Transportation Engineering Materials</td>
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<td>X</td>
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<tr>
<td>CE 153 Traffic Operations and Control</td>
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<tr>
<td>CE 191T Sustainable Transportation Systems</td>
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<td>X</td>
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<td>CE 191T Transportation GIS</td>
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<tr>
<td>CE 191T Urban Transit Systems Design</td>
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<tr>
<td>CE 191T/165 Sustainable Agricultural Infrastructure</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 191T/188 CE Entrep (New Name)</td>
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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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Fall 16</th>
<th>Spr 17</th>
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<tbody>
<tr>
<td>CE 205</td>
<td>Computing in Eng Analysis</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 206</td>
<td>Engr Env. Impact</td>
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<tr>
<td>CE 210</td>
<td>Research Methods</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 223</td>
<td>Adv Soil Mech.</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 225</td>
<td>Num Meth in Geot Engr</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CE 245</td>
<td>GeoEnv. Eng</td>
<td></td>
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<tr>
<td>CE 291T</td>
<td>Reliab Meth Geot &amp; Struc Engr</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CE 230</td>
<td>Adv Theory of Struc</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 232</td>
<td>Prestressed Conc</td>
<td></td>
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<tr>
<td>CE 233</td>
<td>Adv Steel</td>
<td></td>
<td>X</td>
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<tr>
<td>CE 236</td>
<td>Reinf Mansr. Theory</td>
<td></td>
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<tr>
<td>CE 238</td>
<td>Stab. of Structures (formerly CE291T)</td>
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<tr>
<td>CE 239</td>
<td>Adv Reinf Conc</td>
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<tr>
<td>CE 240</td>
<td>Engr. Hydrology</td>
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<tr>
<td>CE 241</td>
<td>Contaminant Transport &amp; Fate</td>
<td></td>
<td>Sabbatical</td>
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<tr>
<td>CE 242</td>
<td>Urban &amp; Industrial Water Systems</td>
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<td>X</td>
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<tr>
<td>CE246A</td>
<td>Adv Water Qual</td>
<td></td>
<td></td>
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<tr>
<td>CE 246B</td>
<td>Adv Water Qual</td>
<td></td>
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<tr>
<td>CE 291T</td>
<td>Water Resources Systems Optimization</td>
<td>X</td>
<td></td>
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<tr>
<td>CE 291T</td>
<td>Transportation Systems Planning</td>
<td>X</td>
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<tr>
<td>CE 291T</td>
<td>Engineering Data Models and Analytics</td>
<td></td>
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<tr>
<td>CE 291T</td>
<td>Urban Transit Systems</td>
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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. Xiaojun 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
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
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.”
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
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
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
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)
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
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.


Civil Engineering Profession

Another movie trailer: [Link]
Civil Engineering Graduate Program

Questions?
Civil Engineering Graduate Program

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

wfwright@csufresno.edu

(559) 278-5591