Biological Engineering as an Alternative to Civil Engineering

Are you interested in protecting the environment or structural design, want to be an engineer, and are looking for an alternative program to Civil Engineering? The Biological Engineering major may be just the right choice for you! A student in Biological Engineering chooses from three options:

1. Natural Resource Engineering option
Design of protection systems to reduce soil, nutrient, and chemical run-off, stormwater control, bioremediation and other biological waste treatments such as composting, biogas production, and wetland construction.

2. Agricultural Engineering option with emphasis on Structural Design
Structural analysis and design of buildings and facilities, primarily utilization of engineered wood products.

Agricultural Engineering option with emphasis on Machinery Systems
Design of fluid power systems for power transmission and motion control, as well as power generation for off-road mobile equipment, food processing facilities, and feed handling.

3. Food and Biological Process Engineering option
Production of value-added products by using microbial fermentation for food, feed, and pharmaceutical industries. Unit operations, and heat and mass transfer are emphasized for the design of food processing and manufacturing systems, to bring food from the farm to the table with minimal nutritional losses. Includes development of bio-based energy such as ethanol production.

The Biological Engineering program is attractively small (50 graduating students per year), which means there are great opportunities! Some highlights are:

Small classes
Almost 100% career job placement
Great scholarship availability
Departmental computer lab available exclusively to B E students 24 hours a day
Internships, co-op, and/or departmental wage positions are readily available

Program Comparison

The two majors require courses that are common and can be used for either program. Certain first and second year courses that are unique to Civil Engineering can still be used if a student switches to Biological Engineering, which has a great deal of flexibility in using credits from other engineering programs. This is illustrated in the tables below:

First and second year courses that are common to both programs	
ENGL 15 – Composition & Rhetoric	ECON 2, 4 – Economic Principles
CHEM 110 – Chemical Principles I	First Year Seminar
CHEM 111 – Experimental Chemistry I	PHYS 211 – Mechanics
MATH 140 – Calculus I	PHYS 212 – Electricity and Magnetism
MATH 141 – Calculus II	MATH 251 – Differential Equations
EDSGN 100 – Intro. to Engineering Design	E MCH 211 – Statics
CAS 100A/B – Effective Speech	E MCH 212 – Dynamics
C E 360 – Fluid Mechanics	E MCH 213 – Strength of Materials
I E 424 – Process Quality Engineering	
General education requirements are the same, including GA, GS, GH, GHA	
Courses specific to the Civil Engineering Major can be applied to the Biological Engineering Major as follows:	
Course taken for C E:	**Counts in B E as:**
GEOSC 001 – Physical Geology	Basic or Biological/Env. Science Elective
MATH 220 – Matrices	Technical Elective (up to 3-6 credits)*
CMPSC 201 or 202 – Programming	Technical Elective (up to 3-6 credits)*
M E 201 – Thermal Science	M E 300 – Thermodynamics
Other C E courses	Engineering Science/Design (up to 6 credits)

*3 technical elective credits for Natural Resource Engineering and 6 technical elective credits for Agricultural Engineering Option

For more information about the Biological Engineering program, please contact:

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