

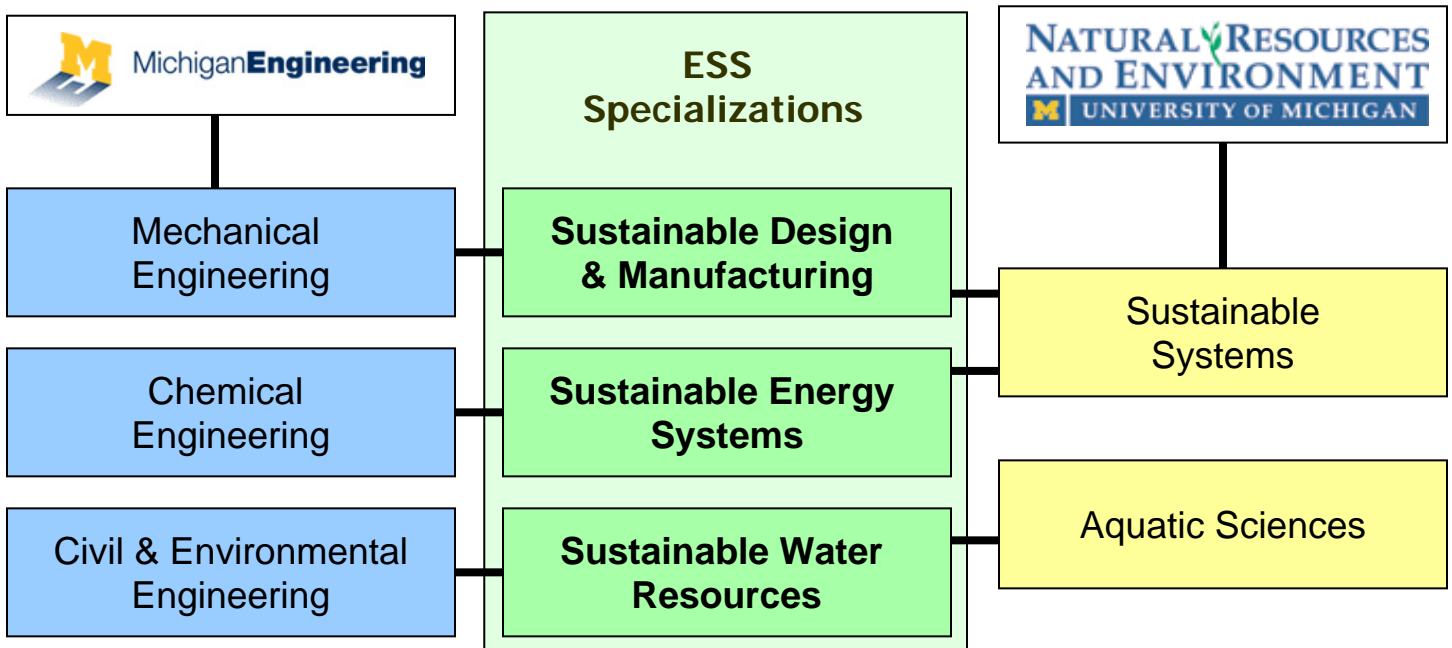
# Engineering Sustainable Systems (ESS)

A new Dual Degree with the School of Natural Resources and Environment and the College of Engineering



*Technology has been the cause of many ecological problems...  
**sustainable technologies must be part of the solution!***

**ESS brings together two nationally recognized programs at Michigan to train graduate students who will create engineered systems that are socially, environmentally, and economically sustainable.**



2 – 2.5 years to complete both M.S. and M.S.E. degrees

54 total credit hours

Students must be admitted to Engineering and SNRE

[http://www.snre.umich.edu/degree\\_programs/engineering\\_essdualdegree@umich.edu](http://www.snre.umich.edu/degree_programs/engineering_essdualdegree@umich.edu)

## The ESS Education

- The *only* engineering and environmental science dual graduate degree offered nationally.
- You receive a **comprehensive understanding of major sustainability challenges**, including global climate change, energy scarcity, ecological degradation, environmental threats to human health, and resource scarcity.
- Curriculum include **engineering design approaches for products, processes, and services** that facilitate sustainable application of technology.
- The **scientific knowledge and methods required to evaluate the sustainability** of engineering systems is emphasized.
- Evaluation of **successful examples of sustainable technology design and opportunities to practice sustainable design** concepts are central to degree completion.
- **Analysis of market and public policy constraints** are important parts of the curriculum that help encourage patterns of **sustainable consumption**.

## Typical ESS Courses (from all 3 specializations)

### ME 589

Ecodesign & Manufacturing

### NRE 557/CEE 589

Industrial Ecology

### NRE 571

Environmental Economics

### ChE 686/CEE 686

Case Studies in Sustainable Engineering

### NRE 527

Social Institutions for Energy Production

### CEE 589/NRE 595

Risk-Benefit Analysis in Environmental Engineering

### NRE 508

Wetland Ecology

### NRE 510

Environmental Governance, Choices, Institutions, Outcomes

## Employment Opportunities

- Engineering consulting firms, industry R&D labs, entrepreneurial startups
- Government agencies and labs (NREL, EPA, DOE, DOTs, DEQ)
- Non-profit and non-governmental organizations (Environmental Defense, Union of Concerned Scientists)
- Leading industry firms needing engineers with knowledge about sustainability issues, technologies, and legislation

## For More Information

ESS Program Homepage: [http://www.snre.umich.edu/degree\\_programs/engineering](http://www.snre.umich.edu/degree_programs/engineering)

College of Engineering: <http://www.engin.umich.edu>

Mechanical Engineering: <http://www.me.engin.umich.edu>

Chemical Engineering: <http://www.engin.umich.edu/dept/cheme>

Civil & Environmental Engineering: <http://www.cee.engin.umich.edu>

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