



## Course Outline of Record

Curriculum Committee/VP Instruction Approval: 03/15/2017

Governing Board Approval: 04/03/2017

**DEPARTMENT:** Engineering

**COURSE NUMBER:** ENGR 98A

**C-ID:** 0

**CATALOG COURSE TITLE:** Global Engineering

**SHORT TITLE (19 character maximum):** Global Engr

**STUDENT UNITS:** 2

**LECTURE HOURS:** 2

	<b>Hours per week (based on 18 weeks)</b>	<b>Total hours per Term (based on 18 weeks)</b>	<b>Student Units</b>
<b>Lecture Hours:</b>	2	36.00	
<b>Lab Hours:</b>	-	-	
<b>Arranged Lab Hours:</b>	-	-	
<b>Total Contact Hours:</b>	2.00	36.00	2
<b>Expected Hours of Homework/Study:</b>	4	72.00	
<b>Total Student Learning Hours:</b>	6.00	108.00	2

**REPEATABILITY:** May be taken 1 time(s).

**GRADE OPTION:** Letter Grade or P/NP

**PREREQUISITE(S):**

**CO-REQUISITE(S):**

**HYBRID REQUISITE(S):** ENGR 5

**RECOMMENDED  
PREPARATION(S):** ENGL 100  
ENGR 25  
READ 100

**CATALOG COURSE DESCRIPTION:** Prepares students for the Engineering Abroad Program. Explores the interrelationship between people, culture, the global economy, the environment, sustainability, technology, ethics, engineering problem solving, and engineering design.

**CORE CABRILLO  
COMPETENCIES:**

Communication - reading, writing, listening, speaking and/or conversing

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Critical Thinking and Information Competency - analysis, computation, research, problem solving

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Global Awareness - an appreciation of scientific processes, global systems and civics, and artistic variety

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Personal Responsibility and Professional Development - self-management and self-awareness, social and physical wellness, workplace skills

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**LEARNING OUTCOMES:**

1. Demonstrate the interrelationship between engineering, technology, the environment, the global economy, history, politics, culture, and society in the study-abroad country.
2. Examine the physical and cultural role of health and safety in the study-abroad country.

**OBJECTIVES:**

1. Determine the politics, economy, education, geography, people, and culture of the study-abroad country.
2. Recognize the importance of health and safety in the study-abroad country including an understanding of gut microbiota and its crucial role in digestive health and the immune system.
3. Acquire an in-depth understanding of the engineering design process

- and the importance of culturally-appropriate technology.
4. Determine the value of the sustainable design and ethical decision making.
  5. Understand the impact that American student ambassadors can have on the communities of people in the study-abroad country.
  6. Examine the impact that engineering and technology can have on culture and the environment.
  7. Recognize the cultural, artistic, and engineering contributions made by peoples of study-abroad country throughout history.
  8. Recognize the value that the diverse population and culture have on society
  9. Understanding the theory of Maslow's hierarchy of needs and realizing that the needs of people in developing nations are quite different than the needs of the ambassadors.

## **CONTENT:**

1. Study-abroad country's history, economy, industry, culture, geography, weather, cuisine, arts, crafts, religion, politics, plants, animals, music, entertainment, business, technology, health, medical, education, family, environmental concerns
2. Relationship between engineering, technology, society, and culture
3. Global economy of engineering
4. How to prepare to be healthy, safe, aware, and have emotional well being while in the study-abroad country
5. Gut microbiota, its function and composition, and its role in digestive health and the immune system
6. Role culture plays in determining the technological advancement of a society
7. Impact of technology on culture
8. Engineering design process
9. Engineering successes and failures
10. Sustainable and culturally-appropriate design
11. Engineering ethics
12. Engineering students as US ambassadors and responsibility
13. Best practices in designing engineering solutions
14. Engineering design process
15. Ethical standards
16. Importance of culturally-appropriate technology and simple design solutions
17. Artistic and engineering contributions
18. Cultural diversity in study-abroad country
19. Maslow's hierarchy of needs

## **ASSIGNMENTS:**

### **Out-of-class Assignments**

1. Research assignments on the following topics: history, economy, industry, culture, geography, weather, cuisine, arts, crafts, religion, politics, plants, animals, music, entertainment, business, technology, health, medical, education, family, and environmental concerns
2. Read World Citizen Guide about role of American ambassadors and answer 50 questions
3. Research and reflection questions on the following topics: culture, languages, diversity, ethics, health, safety, ethics, artistic and engineering contributions
4. Engineering sustainable and culturally-appropriate design solutions
5. Evaluate relationship between culture and technology
6. Group design work

### **In-class Assignments**

1. Employ engineering design processes
2. Discuss and devise a plan as a team to work collaboratively with community abroad
3. Best practices in designing engineering solutions
4. Presentations of research
5. Discussions of research and reflection topics
6. Formulate preliminary designs

## **METHODS OF EVALUATION:**

### **Typical classroom assessment techniques**

- Research Projects
- Papers
- Oral Presentation
- Projects

### **Required Assignments**

- Class Participation
- Class Work
- Home Work
- Lab Activities

## **METHODS OF INSTRUCTION:**

- Activity
- Critique
- Discussion
- Lecture
- Observation and Demonstration
- Projects

**REPRESENTATIVE TEXTS:**

- Allen, David T. and David R. Shonnard (2012). *Sustainable Engineering: Concepts, Design, and Case Studies* (1/e). New York Prentice Hall. ISBN: 978-0132756549
- Articles pertaining to the abroad country.



## Course Outline of Record

Curriculum Committee/VP Instruction Approval: 03/15/2017

Governing Board Approval: 04/03/2017

**DEPARTMENT:** Engineering

**COURSE NUMBER:** ENGR 98B

**C-ID:** 0

**CATALOG COURSE TITLE:** Engineering Abroad

**SHORT TITLE (19 character maximum):** Engr Abroad Exper

**STUDENT UNITS:** 1

**LAB HOURS:** 3

	<b>Hours per week (based on 18 weeks)</b>	<b>Total hours per Term (based on 18 weeks)</b>	<b>Student Units</b>
<b>Lecture Hours:</b>	-	-	
<b>Lab Hours:</b>	3	54.00	
<b>Arranged Lab Hours:</b>	-	-	
<b>Total Contact Hours:</b>	3.00	54.00	1
<b>Expected Hours of Homework/Study:</b>	-	-	
<b>Total Student Learning Hours:</b>	3.00	54.00	1

**REPEATABILITY:** May be taken 1 time(s).

**GRADE OPTION:** Letter Grade or P/NP

**PREREQUISITE(S):** ENGR 98A

**CO-REQUISITE(S):**

**HYBRID REQUISITE(S):**

**RECOMMENDED  
PREPARATION(S):** ENGL 100  
READ 100

**CATALOG COURSE DESCRIPTION:** Explores the interrelationship between engineering, technology, and culture through a service-learning or an experiential engineering abroad experience.

**CORE CABRILLO  
COMPETENCIES:**

Communication - reading, writing, listening, speaking and/or conversing

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Critical Thinking and Information Competency - analysis, computation, research, problem solving

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Global Awareness - an appreciation of scientific processes, global systems and civics, and artistic variety

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Personal Responsibility and Professional Development - self-management and self-awareness, social and physical wellness, workplace skills

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**LEARNING OUTCOMES:**

1. Examine the role that engineering plays in the global economy.
2. Demonstrate competency in cross-cultural engineering communication.
3. Apply principles of the engineering design process and ethical decision making in selecting culturally-appropriate solutions.

**OBJECTIVES:**

1. Work effectively in groups with villagers in study-abroad country on an engineering design project.
2. Design a sustainable engineering solution with a village in a study-abroad country.
3. Analyze how culturally-appropriate technology and simple design solutions can benefit a society.
4. Determine the role that engineering plays in the global economy.
5. Build competency in cross-cultural communication.
6. Examine how culture and the abroad experience shape one as a future

engineer.

7. Apply cognitive practices to ensure that decisions are made to promote health, safety, and emotional well being in the study-abroad country.
8. Experience artistic and engineering achievements in study-abroad country.
9. Be cognizant of the best ways to keep oneself's digestive and immune system healthy and in balance.

## **CONTENT:**

1. Sustainable design
2. Impact of technology on daily life of people and culture
3. Best practices in designing engineering solutions
4. Engineering design process
5. Community as client
6. Ethical standards
7. Maintenance of technological systems
8. Importance of culturally-appropriate technology and simple design solutions
9. Reflection: culture and abroad experience
10. Impact that engineering and technology have on culture and the environment
11. Value of the sustainable design and ethical decision making
12. Global economy of engineering
13. Group work on engineering design projects
14. Your place as an engineer in a multicultural society
15. Cultural visits to historical sites with both societal and engineering influences
16. Discovery of historic, artistic, and engineering achievement

## **ASSIGNMENTS:**

### **Out-of-class Assignments**

1. Daily journal including mental and physical health; cultural experiences; engineering activities; interactions with others
2. Personal reflection: how abroad experience impacts students as future engineers
3. Photo journal
4. Preparation of oral presentations

### **In-class Assignments**

1. Employ engineering design process
2. Work collaboratively with community abroad
3. Build and test engineering design project(s)
4. Presentations
5. Visiting local artisans and cultural sites of archeological, artistic, and engineering importance
6. Meet with families, artists, and engineers



## **METHODS OF EVALUATION:**

### **Typical classroom assessment techniques**

- Oral Presentation
- Projects
- Field Trips

### **Required Assignments**

- Group Projects
- Class Work
- Lab Activities
- Student satisfaction with their educational experience
- Competency based written and practical tests which demonstrate the students' ability to apply skills and concepts learned to minimum standards established by the instructor

## **METHODS OF INSTRUCTION:**

- Activity
- Critique
- Directed Study
- Discussion
- Field Experience
- Lab
- Observation and Demonstration
- Projects
- Service Learning

## **REPRESENTATIVE TEXTS:**

- Allen, David T. and David R. Shonnard (2012). *Sustainable Engineering: Concepts, Design, and Case Studies* (1/e). New York Prentice Hall. ISBN: 978-0132756549