



## International Capstone Design

### Synopsis

- Can a child's teeter-totter pump water?
- What ingenious ideas can USF students develop?
- Will a cross-cultural experience change the way students view "our" U.S. engineering world?

### Class Focus: Education and humanitarianism.

The course involves international travel and work on a construction site, feasibility studies an engineering design and creation of construction plans and specifications. The classes are conducted as if students are working in an engineering design firm. Depending on the specific project, students will learn and experience:

- international "client" & city official meetings
- local construction, materials & techniques
- data gathering & testing
- project scheduling & site coordination
- team building & decision-making
- new ways of thinking
- different language and culture

**Vision:** For students to generate engineering work that benefits a developing country and their people.

### *Service is the rent that we pay to live on Earth.*

This project class will inspire students with the vision of lifelong learning, giving, and community service, to serve as a strong foundation for their careers and lives.

### Background

Construction work in underdeveloped areas is typically done in a simple manner with simple tools, making it easy for students to use and understand the materials, tools, techniques and stages of construction. The uniqueness of the projects and techniques make an excellent laboratory to further understand implications of design, design documentation, construction productivity, materials and procurement, scheduling and on-site coordination, without overwhelming the students with typical US scale, techniques and schedule rigors. It is a fantastic way to generate discussions and experiences revolving around project management, teambuilding and communications while at the same time learning lessons of appreciating other cultures and flexibility in solving problems. This experience serves as the basis for the design project. Each team of 3 or 4 students is assigned their own design project.

### Example Projects:

An on-going project site for this course is a school that is being built in Santa Cruz, Bolivia. It is the dream of an inner-city school to build a new school on the outskirts of Santa Cruz room by room. Engineering opportunities arise daily during construction. Sometimes they decide to add a second floor room when it has been designed as a single story! The school has grown from 7 students to over 300 – room by room! Student design projects help alleviate local neighborhood flooding, manage wastewater, and develop roads, sites and more.

Projects designed and built for rural mountain villages in the Dominican Republic mountains

were water storage and distribution systems. One project team designed a suspended bridge over a dangerous river crossing.

Imagine a team working on the construction and returning to develop design documents to serve as the basis for next semester's construction project.





### YOUR INVOLVEMENT PROVIDES:

- An opportunity to gain valuable experiences that:
  - Enhance leadership, interpersonal communication, and team building skills.
  - Grant satisfaction from public service.
  - Encourage lifelong and cross-cultural learning.
  - Appreciate diversity of problem solving.
  - Develop creativity and solve open-ended problems
- Links with USF and world community outreach.
- Recognition of global concerns.

**These experiences are provided in a "real life" laboratory!**

### Cost Summary

Program fees for the class cover student lodging and expenses, faculty travel, and construction materials. Local people do not have funding to cover the local construction materials. Students pay for their own travel and souvenirs separately.

### Potential Student Studies:

Design and construction techniques are discussed on-site. Other activities could include:

- |                          |                               |
|--------------------------|-------------------------------|
| • Feasibility studies    | • Data gathering              |
| • Client & City meetings | • Specifications              |
| • Site survey and layout | • Design & engineering report |
| • Project administration | • Test & analyze materials    |
| • Scheduling             | • Develop procedures          |
| • Estimating/budgeting   | • Quality control             |

Additional outcomes of the on-site project experience could be news releases, posters, and web sites in addition to the design or contract documents and engineering reports which are sent to the international "clients" of our design firm.

Note: Although these are CE designated courses, its benefit and application is not limited to Civil and Environmental Engineering. The course meets all ABET requirements for a capstone design course.

### Program Directors:

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**University of South Florida's**

## International Capstone Design

Department of Civil and Environmental Engineering

**6 credits**

...the **ULTIMATE** definition of engineering:  
**Helping design and build for the basic needs of people.**

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