

CE 45600 Engineering for International Development I (E4ID I)
University of Notre Dame
Department of Civil Engineering & Geological Sciences

Course Description: Engineering for International Development I partners students with community organizations to put their engineering skills into service. Currently the community partner is Bridges2Prosperity, a nonprofit organization providing pedestrian bridges to communities worldwide who lack such basic infrastructure. Under the banner of the ND SEED (Notre Dame Students Empowering Engineering Development), six to seven students will be accepted each academic year for this course and will supervise all aspects of bridge design and construction, including fundraising and international study via site surveys over Fall Break and construction in May following the spring semester. To join this course in the fall of any academic year, students must apply and be accepted by ND SEED in the prior spring semester. Students are expected to participate in the course for a full academic year, through bridge construction in May. The project is also affiliated with the Center for Social Concerns International Summer Service Learning Program (ISSLP) and has additional curricular requirements through ISSLP.

Course Objectives:

1. Students will demonstrate the ability to apply basic engineering and design principles and the use of governing codes and regulations to design an engineering system (footbridge).
2. Students will demonstrate the ability to execute comprehensive project management in a team setting, including outward marketing of the project focus, solicitation of funding, site survey/field work/market research, procurement, design, construction scheduling and final construction and certification.
3. Students will demonstrate the ability to interface effectively with external parties such as NGOs, the communities being served, entities throughout the university community, and sister academic institutions abroad in delivering engineering designs that effectively serve the developing world.
4. Students will demonstrate the ability to integrate the insights and perspectives from their CSC ISSLP preparations to support the respectful delivery of engineering designs that are sustainable and community-driven.
5. Students will demonstrate appreciation for the importance of civil infrastructure in transforming communities' quality of life and the opportunity to use engineering in direct service.

Meeting Format: As a student-led effort, ND SEED teams are charged with self-organizing their team and bridge project. The team interfaces with a Bridges 2 Prosperity representative and the course instructor as needed in this

process. At minimum, the course instructor and the team will meet weekly at a time and location identified by the team.

Instructor: Dr. Kijewski-Correa
162 Fitzpatrick Hall
Office: 631-2980
Cell: 574-220-3679
Email: tkijewsk@nd.edu

Website: ndseed.nd.edu

Course Expectations: The primary expectation is that the team will execute the following tasks to support the construction of their bridge:

1. Fundraise the projected cost of bridge construction, team travel, advertising/fundraising and other incidental expenses. Generally this is \$20,000
2. Execute the comprehensive design of the footbridge for the targeted community, including the site survey, in accordance with the design guidelines developed by Bridges 2 Prosperity
3. Construct the bridge, in coordination with the local community, under the supervision of Bridges 2 Prosperity, including executing quantities estimates, construction scheduling and vendor selection
4. Update the ND SEED Manual with new experiences, lessons learned and strategies to benefit future teams
5. Contribute a novel aspect to the shared knowledge of ND SEED
6. Participate in the International Summer Service Learning Program (ISSLP) through the Center for Social Concerns through the programming developed for ND SEED
7. Operate in accordance with all rules and policies of Bridges 2 Prosperity, the University of Notre Dame (including SAO) and serve as an ambassador for ND SEED in various university settings

Roles: While each team self-organizes, teams generally assign members with specific roles as detailed in the ND SEED Manual (B2P Liaison, Financial/SAO Coordinator, Lead Designer, Project Manager, Public Relations/Development). Each semester teams will conduct peer evaluations to provide feedback to one another.

Grades: Teams are graded on their semester report and progress towards the goals established at the start of the semester. Teams will decide at the start of the semester whether to opt for:

- **Communal Grading:** All team members receive the same grade
- **Individualized Grading:** Communal grade is adjusted upwards or downwards based on outcomes of peer evaluation

Fall Semester:

While a detailed list of monthly activities are detailed in the ND SEED Manual, the fall semester focuses primarily on:

- Establishment of roles of teammates and goals for the semester
- Coordinating and executing fall break site survey
- Fundraising and public relations/web presence
- Preliminary Bridge Design submitted to Bridges 2 Prosperity
- End of semester report to instructor and peer evaluation

Spring Semester:

While a detailed list of monthly activities are detailed in the ND SEED Manual, the spring semester focuses primarily on:

- Establishment of goals for the semester
- Continued fundraising and public relations/web presence
- Recruit and select members for next year's team
- Revise and finalize bridge design for Bridges 2 Prosperity
- Develop construction schedule/plans and quantities estimate, procurement of materials
- Coordinate and execute bridge construction in the summer following the semester
- Final report to instructor, peer evaluation, updates to team manual

Credits:

Course is variable credit (1-3) with student responsibilities/roles proportional to the credit level. Most students opt for 2 credits per semester.