University of North Florida Foundation
FOUNDATION BOARD INITIATIVES PROPOSAL
(Maximum request $15,000)

Project Title: Osprey Engineering Consulting
Date: 9/23/19

Department: Civil Engineering, School of Engineering
Ext: 2811

Complete the following pages:

Page 2

1. Project Plan and Supporting Data: Project synopsis, proposal statement, objectives, expected outcome or benefit(s), project schedule, and evaluation. Additional supporting data may be attached.

Page 3

2. Project Plan and Supporting Data (cont.): Personnel services, contractual services, expenses, operating capital outlay (OCO) (e.g. cost of equipment $1,000+).

Page 4

3. Sectional Annual Progress Reports: Submit narrative within 30 days of the end of each calendar and fiscal year to Academic Affairs with copies to Institutional Advancement and Foundation Accounting.

Page 5

4. Final Narrative Report: Submit a final report of chronological history and outcome of the project within 30 days of the completion of the project to Academic Affairs with copies to Institutional Advancement and Foundation Accounting.

Supplemental Questions (Required)

1. How many UNF students (specify undergrad and grad) will be involved in this grant? Up to 60 undergraduates.
2. How many people in the community will be directly affected by this grant? Up to 250 community members and high school students.
3. How many prior years have you received Foundation Board funding for this project? 0

BUDGET SUMMARY

<table>
<thead>
<tr>
<th>Personnel Services</th>
<th>$2,150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractual Service</td>
<td>$10,000</td>
</tr>
<tr>
<td>OCO Equipment</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$12,150</td>
</tr>
</tbody>
</table>

Estimated completion date: (Must be within 24 months of award, usually January) May 2012

APPROVALS

College/Unit

Requestor: Christopher J. Brown
Signature: [Signature]
Date: 9/23/13

Director/Chairperson: Mi rat Tiryakioğlu
Signature: [Signature]
Date: 6/13/11

Dean: Peter Braza
Signature: [Signature]
Date: 

Academic Affairs: Yes (forward to Inst. Adv.)
Signature: [Signature]
Date:

No (return to college)

FOUNDATION BOARD PROPOSAL APPROVAL

Yes

Approved Amount: $12,150
Date of Approval/Disapproval:

1. Institutional Advancement sends requestor an approval letter w/ copy to Academic Affairs and Foundation Accounting.
2. Forwards original proposal documentation to Foundation Accounting.
3. Institutional Advancement #:

No

1. Institutional Advancement sends requestor a disapproval letter w/ copy to Academic Affairs.

Print/Type Name: [Name]
Signature: [Signature]
Date:

FOUNDATION ACCOUNTING USE ONLY

Account Project Number: [Account Project Number]
Name: [Name]

(date) New account letter sent to Requestor. Employee Initials: [Employee Initials]
Forward originals to Foundation Accountant.

UNF Foundation Board Initiatives Proposal
Page 1 of 10
(8/2010)
Part I. Project Plan and Supporting Data

Instructions: State clearly the project details. Use the following major headings: Project synopsis (one paragraph to be used in Foundation Board materials), proposal statement, objectives, expected outcome or benefit(s), project schedule and method of evaluation. Note: Limit to one additional page of narrative and include exhibits as needed.

**Project Synopses:** Research has shown that engaging students enhances learning outcomes. "Millennial" engineering students at UNF will become more engaged by employing new active learning teaching methods. One opportunity that would benefit our Millennial students is to build a cohesive learning community focused on civic-minded projects. Students enrolled in the senior capstone design course series will be employees of "Osprey Engineering Consulting," an engineering consulting simulator designed so that each student will engage with community-based clients, mentors, and stakeholders that are part of a specially developed learning community. The students will also act as *ambassadors* for Osprey Engineering Consulting by adopting a local high school and working with high school students to build model concrete canoes that will be tested on campus as part of a regional competition. Through the student ambassador program, UNF civil engineering students will build bridges to 8 to 12 area high schools (K-12) in the Northeast Florida region.

**Proposal Statement:** The Osprey Engineering Consulting Simulator will consist of three key components that will work together to create a vibrant engineering learning community. The new learning community will include senior civil engineering students, community partners, and partner K-12 high schools. The project cost is anticipated to be $12,150 and will be implemented over a one year period starting in August 2011. The Osprey Engineering Simulator will rely heavily on community members. The community members will form one part of the learning community for the civil engineering senior capstone design series. Community members will be involved in one of three roles: clients, mentors, or stakeholders. Senior civil engineering students will work in 4 to 6 person project teams and will interact directly with the community members to fulfill their capstone design experience. Approximately 10 project teams will be responsible for developing proposals, design reports, specifications, and design drawings. Community roles within the engineering consulting simulator are outlined below.

Client/customer role - Provide a current or "on the shelf" project for a team to work on. Meet periodically with a student team in role as client. Each client community member will provide project requirements, constraints (e.g., cost, schedule, environment), and expectations.

Mentor role - Periodically meet with a project team and help them focus their proposal during the fall semester and then carry out the design project in the spring. Probably would require 6 meetings per year with the team and additional communication via email/telephone.

Stakeholder role - The stakeholders would be the most seasoned professionals in the community and include both engineers and non-engineers. The stakeholder review team would provide design review and project suggestions to all teams at designated review/interface periods.

The students will also engage with local area high schools. Each project team will be responsible for acting as engineering *ambassadors* to one area high school. The student team will engage the high schools as stakeholders that can provide critical feedback on their project goals and focus. In return, the student teams will mentor high school student teams who will develop a design for and then construct a model concrete canoe to be tested at UNF in the spring 2012 semester. The model concrete canoe contest
will be similar to the full-size concrete canoe contest sponsored by the American Society of Civil Engineers (ASCE). The contest will be administered by UNF faculty and students and will be held on a Saturday at UNF during the spring semester 2012. It will also present a great opportunity to invite the parents of high school participants to campus for a College of Computing, Engineering, and Construction open house in order to forge even stronger bonds with the community. The UNF student – high school student interaction is important for the long-term sustainability of Osprey Engineering since the simulator will need new “employees” every year if it is implemented fully. It is hoped that the student ambassador program will ensure a steady stream of new students into engineering at UNF. In summary, the new learning community would include student peer to peer learning, UNF student to community member learning, and UNF student to high school student learning/mentoring. It also includes elements of all three UNF Foundation Board criteria. The overall design of the simulator was grounded in the education and learning literature while also focusing upon the three proposal criteria. Research support is summarized in Attachment 1 below.

Objectives: Three primary objectives are envisioned for the simulator.
1. Improve level of student satisfaction with the senior capstone course series.
2. Expand the number and diversity of community partners for the School of Engineering.
3. Expand the number and diversity of area high school partners for the School of Engineering.

Expected Outcomes/Benefits: It is expected that the proposed project would provide tangible benefits and measurable outcomes if it is implemented. The outcomes and benefits are linked to each project objective as follows:

1. It is expected that student satisfaction regarding the senior capstone series will be increased by up to 20% as measured by senior student surveys and ISQs for the course.
2. It is expected that the number of active community partners that interface with the School of Engineering will increase by 25%. In addition, the project should help add up to 3 additional community partners that represent under-represented groups in engineering including women and minorities.
3. It is expected that the number of active high school partners that interface with the School of Engineering will increase by 30%. In addition, the project should help add up to 3 additional high school partners that represent mostly minority student bodies.

Project Schedule: Should this proposal be funded, the fully implemented Osprey Engineering Consulting simulator would start in August 2011 and continue for 1 year. Once the project is up and running it is designed to be self-sustainable through regular budgetary line items.

Method of Evaluation: Both quantitative and qualitative evaluation methods will be employed for this project. First, all senior civil engineering students will complete a project-specific survey which asks about engagement, learning, teaching, facilities, and other items pertaining to the student experience in civil engineering. This survey, in conjunction with the course ISQs, will be used to quantitatively evaluate to what degree objective # 1 is reached. In addition, each student project team will be responsible for maintaining a team website and a team personal journal outlining the team accomplishments for the year, degree of team work achieved, relationship with the community, and interaction with area high schools. The team websites and journals will be analyzed using “context analysis” to determine trends and to provide additional information for objective 1. Objectives 2 and 3 will be evaluated based upon a comparison of the current list of School of Engineering partners with new list developed within the simulator. This comparison provides a fair way to measure the degree to which the project achieved the stated objectives for 2 and 3.
**Part II. Project Detail Budget/Narrative:**

Instructions: List by category the anticipated budget cost and narrative description of the project per line item. Attach additional sheets as needed. Categories: personnel services, contractual services, expenses, OCO equipment.

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Budget Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Services</td>
<td>$2,150</td>
<td>1-Week summer salary for Dr. Chris Brown to develop program materials and coordinate with up to 20 possible community partners.</td>
</tr>
<tr>
<td>Expenses</td>
<td>$10,000</td>
<td>Project expense funds for student teams to develop their projects. Since Osprey Engineering will be run as a consulting simulator, each team will require resources to work on real civic-minded projects. These funds will be used for engineering materials (e.g., concrete, steel, tools), small equipment (&lt; $1,000), American Society of Civil Engineers (ASCE) engineering competition fees, transportation to meet with community partners and high school partners, rental of engineering instrumentation or specialized computing resources, design software, transportation for student members to attend model concrete canoe competition, and material stipends (for cement and mold material) for up to 12 area high schools that opt to compete in the model concrete canoe competition.</td>
</tr>
<tr>
<td><strong>Total =</strong></td>
<td><strong>$12,150</strong></td>
<td></td>
</tr>
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</table>
Exhibit 1 - Research Support and Problem Understanding

Overview: Science, technology, engineering, and mathematics (STEM) are widely regarded as critical to the national economy of the United States (Hill et al., 2010). Workforce projections for 2018 by the U.S. Department of Labor show that nine of the 10 fastest-growing occupations that require at least a bachelor's degree will require significant scientific or mathematical training (Hill et al., 2010). The United States is not producing enough STEM professionals; this is especially true for under-represented cohorts in STEM including women and minorities. Increasing the number of students including women and minorities into STEM will depend upon how well colleges and universities engage the new generation of students coined as the "Millennials". How can UNF faculty better teach and engage this cohort of students? Research presented as part of this proposal clearly indicates some potential opportunities. This proposal lays out a comprehensive plan to improve the engagement and learning of senior civil engineering Millennial students thru immersion in a professional practice simulator that works within a multi-disciplinary learning community.

Simulator Design Basis: The design of Osprey Engineering Consulting was grounded in the educational research literature and customized to meet the special needs of the Millennial students of today. In order to incorporate the best teaching innovations for Millennial students, first we must better understand the Millennials themselves. The monikers are many: Generation Y, Echo Boomers, GenMe, the Net Generation, RenGen, and Generation Next. One name that appears to be gaining currency is "Millennials," (Rickes, 2009). At nearly 100 million strong (including some 10 million immigrants), Millennials are the largest generational cohort in history (Rickes, 2009). Millennial students are believed to be wired differently than their predecessors and will require educators to make significant changes in course and curricula format and delivery. Without such changes, engagement and retention of millennial students may be poor. Millennials are civic minded and are concerned with community and service issues (Nicoletti & Merriman, 2007). Millennials are technologically competent, effortless with cell phones, PDAs, and iPods (Pardue & Morgan, 2008). They are described as optimistic, assertive, positive, friendly, cooperative team players who gravitate toward group activities (Pardue & Morgan, 2008). Sweeney (2006) noted that Millennial students learn best in a collaborative learning environment and in environments that make learning interesting. According to Sweeney (2006) and Nicoletti & Merriman, (2007), lecturing is the least effective teaching strategy to use to create a positive learning environment for the Millennial student. Yet, lecturing still is the preferred teaching strategy by most faculty. Millennials prefer active and engaging activities, such as simulations and group work, not learning by lecture or the teacher-centered approaches that faculty tend to favor (Pardue & Morgan, 2008; Brown & Hattis, 2010). While it is not necessary to completely abandon time-honored methods, it is important to reexamine our approach and integrate experiential learning, including active questioning, group work, multimedia, and hands-on activities into our teaching (Pardue & Morgan, 2008). Additionally, "learning by doing" (De La Hoz Casas & De Blas Del Hoyo, 2009) is a powerful tool to promote learning for both teachers and their students. Crone & MacKay, (2007) also advocate active experiential learning tied to the community. They noted experiential education allows for increased educational outcomes. By helping students see—perhaps for the first time in their lives—that the work in which they are engaged is meaningful work that is important for them to
accomplish (e.g. engaged in the community), we can help students take the initiative, avoid failure, and learn (Crone & MacKay, 2007; Oakes & Jannieson, 2004).

General educational research also indicates that team-based, community-based, or virtual team teaching and learning is extremely beneficial (Brown & Hansen-Brown, 2010). Beatty et al. (2009) reviewed the benefits of team-based learning in a pathophysiology and therapeutics sequence of courses. Kruszewski et al. (2009) showed that collaborative teaching was effective in translating clinical skills into practice for nurses. Yamarik (2007) recommends cooperative learning in small groups to improve student academic performance. Both Rhoulac-Smith et al. (2008) and Hodder (2009) endorse creation of "learning communities" to improve student interaction with peers, outside experts, and instructors. Learning community pedagogy promotes deep and meaningful learning (Martin et al., 2008; Brown & Hansen-Brown, 2010). Although it appears to be quite effective, experiential and community based teaching has not been used a great deal in civil engineering courses. Experiential learning, community involvement, and mentoring also seem to be important elements in improving retention and persistence of women and minority students (Tsui, 2007; Solorzano, 1993).

Improved development and engagement of Millennial civil engineering students will occur if we use creative resources and strategies that play to the strengths of the millennial learner. Based upon the research, the proposed "Osprey Engineering Simulator" incorporates the following teaching strategies:

- Simulation and role-playing;
- Civic-minded community projects;
- Experiential and authentic learning activities;
- Learning communities involving community experts and peers;
- Mentoring; and,
- Cooperative or team approach to teaching and learning.

**Overall Project Benefits:** This project should be funded because it will provide enormous benefits to UNF students, community partners, and local high schools. Each group will become more engaged by the course activities and will develop stronger bonds that will be beneficial to all. The proposal targets each of the three UNF Foundation Board proposal criteria. Osprey Engineering will function similar to a real consulting firm and will provide a fabulous active learning opportunity for our UNF students. The UNF students will interface directly with local high schools including those representing under-represented groups in engineering. Lastly, the project benefits the entire North Florida community by working on civic-minded projects in a collaborative way. This project best meets the stated goals of the UNF Foundation Board.
References:


