



FERRIS STATE UNIVERSITY
COLLEGE OF ENGINEERING TECHNOLOGY

March 31, 2014

Patty Terryn
Diversity and Inclusion Office
1201 S. State St., CSS 312
Big Rapids, MI 49307

Re: Ferris State University Faculty and Staff Diversity Mini Grant

Dear Granting Committee,

Thank you for the opportunity to apply for the *Ferris State University Faculty and Staff Diversity Mini Grant*. Hosting a Mother/Daughter Technology Engineering Aptitude (TEA) event with Ms. Celeste Baine, author of over 20 books about engineering an education careers provides the opportunity to introduce underrepresented ninth and tenth grade students and supportive family members to Science, Technology, Engineering, and Math (STEM) skills and careers. In addition, the students would be exposed to STEM related programs in the College of Engineering Technology (CET) to encourage them to explore career options they might not otherwise consider.

Existing female CET students would be invited to participate in the activities of the event, which would include learning through hands-on lab activities, hearing about career opportunities, especially for young women in the field (i.e., "nontraditional"), and networking with outstanding female role models such as Ms. Baine to strengthen retention efforts and professional development. Beneficiaries of the event would include the high school students, their female caretakers, existing CET students, the K-12 school systems invited to participate, and Ferris State University.

To support the grant funding requested, Ferris' admissions department has agreed to contribute \$1,000. In addition, the College of Engineering Technology will extend at least \$800 given the opportunity to build relationships with potential students from underrepresented populations and develop partnerships with K-12 systems. Following the event, contact would continue with the participants to keep them engaged in a vision for possibilities for their future, such as programs at Ferris. Should you have any questions regarding the attached application, please feel free to contact me directly. Thank you in advance for your time and consideration.

Sincerely,

Leigha Compson, M.A., LPC

Leigha Compson, M.A., LPC
University Career Programs Specialist
Academic Affairs

1009 Campus Drive, Johnson 200
Big Rapids, MI 49307-2280

Phone: (231) 591-2890

Fax: (231) 591-2946

Web: www.ferris.edu/technolo

I. Identification

Name of Primary Applicant: Leigha Compson, M.A., LPC, University Career Programs Specialist
Members of the Team:

Tyrone Collins, M.A., M. ED., LPC, Admissions Counselor, Coordinator of Multicultural Recruitment

Jessica Simon, Admissions Recruiter

Joan Totten, Interim Director of Student Affairs

Jill Trinklein, HVACR PR, Marketing and Preadmissions Coordinator

Department or Unit: College of Engineering Technology

Campus Address: 1009 Campus Drive, JOH 200, Big Rapids, MI 49307

Telephone: (231) 591-3204

E-mail Address: compsol@ferris.edu

II. Event Title: Mother/Daughter Technology Engineering Aptitude (TEA) with Ms. Celeste Baine, author of over 20 books about engineering education and careers.

III. Specific core value, strategic initiative or goal related to diversity that the event will address. (See the University Strategic Plan and the Diversity Plan)

Core Values: Collaboration, Diversity, Excellence, Learning, and Opportunity

Strategic Goals: 1.3, 1.5, 2.1, 2.5, 2.6, 3.2, 5.2, 5.3, 5.4, 5.5. Note that given the Strategic Plan is currently being developed at the time this grant application is being submitted, the goals reviewed were pulled from the 2011 version. However, based on the draft of the updated Strategic Plan focus areas, this event would support the following areas:

- Internal partnerships
- Inclusion, civility, and respect
- Cultural and global engagement
- Diverse learning community
- Experiential and holistic education
- Exploratory and innovative scholarly activities
- Lifelong learning
- Professional development
- Relevance

Diversity Plan: Create a University that is welcoming to diverse populations, Recruit, retain, and graduate a diverse student population, Create environments for student learning that are inclusive of and sensitive to a diverse student population.

IV. Abstract (150-200 word, use additional paper if necessary). If the application is approved the abstract will be posted on the Diversity and Inclusion Office website.

Although graduates in the fields of Science, Technology, Engineering, and Math (STEM) are in high demand, women continue to be underrepresented in these career choices. The College of Engineering Technology (CET) in collaboration with Academic Affairs, Admissions, and K-12 partners will host Ms. Celeste Baine, biomedical engineer and author of over twenty books to facilitate a Mother/Daughter TEA (Technology Engineering Aptitude) event for forty female high school students and their female guardians for a total of eighty participants. This full day event will expose young women to opportunities STEM fields through hands-on lab activities and

instruction from role models in the field. Current female students in CET will participate in the learning opportunity as well to serve as role models for the younger students. Participants also will attend a special seminar about opportunities for women in STEM and related CET programs, experience the Ferris State University campus, and engage in a presentation about the college preparation process.

V. Event Narrative (up to 4 pages single-spaced)

Background: As part of the Carl D. Perkins grant funding, higher education institutions are measured against several core indicators (i.e., 5P1 and 5P2) on an annual basis with nontraditional student completion rates serving as one key indicator used to determine the annual amount of funds awarded. Ferris State University's performance levels have been declining and persist below the expected performance level defined by the state. In the 2011-2012 academic year, the State's expected performance level was 20.65% with the average of all colleges exceeding the target at 20.71%. However, Ferris score was 14.07%. In 2012-2013, the state expected a minimum performance rate of 20.70%, and although the average level of colleges in the state increased to 21.27%, Ferris was even further off the mark with 13.61%. Under the Perkins' definition, nontraditional students are those who are pursuing academic programs for fields in which 25% or less of those employed in the workforce are of one gender. For example, in 2013, the U.S. Census Bureau reported that only 13% of employed engineers in the workforce are female, so any females pursuing engineering degrees would be considered nontraditional students. Perhaps not surprisingly then, one of the greatest areas of disparity in terms of nontraditional performance can be found in Ferris' College of Engineering Technology (CET) as its current composition of students is represented by merely 6.39% nontraditional students (i.e., females). Over the past five years, the percentage of women in CET has been declining steadily with the exception of the 2011-2012 academic year. In 2008-2009, 7.41% of the CET students were female, which declined to 7.34% the following year and 6.94% in 2011-2012. The current rate of 6.39% is the lowest rate in the past five years. This downward trend must be addressed to support the diversity efforts of the University, industry demands, and economic growth. The extent of gender disparity is not due to a lack of job opportunities. On the contrary, Ferris faculty consistently report that while the demand for graduates of CET programs often results job placement rates nearing 100%, there is even a higher demand for females. In many cases, faculty members have stated that the industry's demand for hiring females far exceeds the number of graduates available.

Many other institutions and organization are faced with a similar challenge due to issues such as gender-typing stereotypes in professions (e.g., nurses are females, engineers are males, etc.), limited exposure role models, and a lack of self-confidence in subjects such as science, technology, engineering, and math, (STEM). More specifically, research shows that high school girls report feeling less confident in math and science abilities compared to boys even though they earn higher grades in these areas. Studies have shown that even though young women report enjoying math, they may be less likely to pursue math-related careers due to a lack of confidence in their abilities. Interest in math, chemistry, and physics declines for girls in grades 7-12 (Mamaril & Royal, 2008). Furthermore, minorities are consistently underrepresented as less than 16% of all employed engineers identify as Hispanic or African American (Engineering Emergency, 2014) and women's growth STEM fields has declined since the 1990s. An increase in the diversity of professionals is needed to effectively represent and serve our diverse society. It is important to provide opportunities for young women to experience activities related to STEM, connect with female role models in the field, and proactively challenge the gender-typing of occupations that have made such social and structural barriers a reality. Taken further, it is also important that special programs target students as Tsui writes, "To effect substantial enrollment changes in male dominated fields, intervention efforts must target young students," (2009). Milgram writes, "The key to recruiting women and girls to the field in which they are underrepresented is female role models," (2009). One such program that has been shown to be effective in engaging young women and their families with technology and engineering fields successfully has been facilitated by Ms. Celeste Baine of the Engineering Education Service Center. Organized into a daylong format, young women

in ninth and tenth grade will participate in hands-on activities along with a female family member such as their mother to explore the skills associated with careers in the STEM fields.

a. *Requirements:* The Mother/Daughter TEA events have been hosted across the country with much success due to the integration of outstanding female role models, connection to real-world experience and careers, and engaging, hands-on activities. The conceptual framework of the program directly ties into the College's commitment to community outreach to encourage underrepresented populations to consider high wage, high demand careers related to STEM. Hosting a Mother/Daughter TEA event with the support of existing female students and faculty along with special breakout sessions for nontraditional careers, college readiness, and a tour of campus supports Ferris' commitment to diversity and inclusion as anchored by the following Strategic Goals:

1.3 Cultivate a stimulating, student-centered learning environment that integrates theory and practice: The TEA curriculum incorporates several hands-on activities throughout the event so that students have the opportunity to hear about opportunities in STEM and participate in experiential learning through labs. Furthermore, the existing Ferris students who will help with the event will also have the opportunity to learn from the hands-on activities and to experience engagement with outstanding female role models.

1.5 Review the curriculum and increase the emphasis on preparing students for a global society and leadership roles: Involving current students to help with the TEA event provides them with the opportunity to work with diverse students in a leadership capacity as role models. Serving as role models can motivate students to think about opportunities to foster change in their own communities and beyond.

2.1 Sustain the Ferris State University Diversity Plan: Given that the target audience for this event is an underrepresented population, the TEA event directly supports Ferris' diversity efforts. A study of six universities with higher than average enrollment of women in engineering programs found "significant share" of those students participating in special programs later enrolled in their college (Tsui, 2009).

2.5 Enhance the sense of community for everyone at Ferris State University, including those attending or working online and at all FSU sites: This event will provide the opportunity for community outreach and support retention efforts. Representatives from schools with higher than average enrollment of women in college engineering programs report significant recruiting benefits when undergraduates are involved in outreach activities such as tutoring, classroom visits, presentations, etc. Perhaps Fishman captures this idea best in terms of the retention benefits the University could experience through outreach activities, for, "It's not enough to recruit women; you have to help them stay and thrive...(2007)."

2.6 Enhance sharing of information among the University community: A special session will be offered to present material related to career opportunities for students in nontraditional programs.

3.2 Expand the marketing campaign to promote Ferris State University: This event will promote Ferris through marketing in southern, eastern, and central Michigan and the event will be held on campus.

5.2 Develop and implement strategies for increasing collaboration among divisions, colleges, programs and student organizations: Hosting this event provides the opportunity for Ferris to solidify partnerships with K-12 schools and to build relationships with teachers, counselors, administrators and students alike.

5.3 Develop and implement a comprehensive plan for the University community to encompass the activities of its members engaged in volunteer, service and outreach initiatives: Existing students and faculty members will be invited to participate in the event and serve as role models for the young women who attend. Existing students who participate will have the opportunity to earn community service hours.

5.4 Enhance relationships with industry, business, human services and other agencies, educational institutions and government: As previously outlined, the event will involve collaboration with K-12 schools, and Ferris also will be forging partnerships in the STEM community, which is a pathway to continue recruiting underrepresented populations for Ferris programs.

5.5 Enhance outreach to inform, support, and educate students about higher education, its processes (i.e. financial aid), career possibilities, and Ferris: Participants in the event will be able to attend a college

readiness seminar hosted by an admissions representative to learn about eligibility requirements and courses to take in high school to prepare for college.

b. *Goals:* Hosting Ms. Baine to present at a Ferris TEA event will provide the opportunity to connect with potential Ferris students and encourage young women to remain focused on taking math and science course in high school in order to achieve ACT scores and grade point averages that would allow them to be accepted into the College of Engineering Technology. After the TEA curriculum is shared with the students, Ferris representatives will have a captive audience to present topics including preparing for college, opportunities for nontraditional students in the College of Engineering Technology, as well as give the group a tour of the Ferris campus. "To attract females to male dominated majors, we need to ensure that career fields are not represented in a narrow and outdated manner," (Tsui, 2009). This is exactly the type of opportunity the TEA event provides.

Objective 1: Introduce female students to career opportunities in Engineering Technology through hands-on lab activities and exposure to successful role models to encourage young women to continue taking math and science courses throughout high school. This objective will be measured by the following: Number of mother-daughter teams who participate, demographics of participants, results from participant evaluations of effectiveness of the role models' presentations, and results from caretakers' evaluations that indicate they would support the student in pursuing STEM careers.

Objective 2: Engage existing female students in the event to provide them with multicultural professional development opportunities and to support retention efforts of this underrepresented population. This objective will be measured by the following: Number of female students who volunteer and community service hours accrued and results from volunteer evaluations of the impact of the event on multicultural professional development.

Objective 3: Raise awareness of Ferris State University's College of Engineering Technology programs to ultimately create an environment that supports an increase in the diversity of students and underrepresented populations. This objective will be measured by the following: Results from participant evaluations of content of the College of Engineering presentation and tour portion, results from participant evaluations that indicate a sense of feeling comfortable and accepted, and results from evaluations from K-12 schools report support of CET programs for underrepresented populations.

c. *Relevance:* Improving the nontraditional number of students enrolled in the College of Engineering Technology is a priority. The Mother/Daughter TEA event will focus on recruiting and retaining students from underrepresented genders, ethnic, and racial groups. The College and its industry partners are interested in supporting a more diverse student base in order to better meet the needs of the increasingly diverse base of consumers both in national and international markets.

d. *Timeline:* The dates below are tentative as we would need to confirm the speaker's availability. In preparing this grant, it was confirmed that the speaker is available in November should the grant dollars be awarded. Tentative date: Saturday, November 8, 2014

1. *Phase 1: May, 2014 – September, 2014*

Confirm speaker date and finalize her travel arrangements [Leigha Compson]

Reserve rooms on campus to host the event [Jill Trinklein]

Confirm admissions representative schedule [Jessica Simon]

Confirm faculty members' schedules for involvement [Leigha Compson]

Create flyers, marketing materials, and application form. [Leigha Compson]

Contact schools to invite the participation from their students [Tyrone Collins and Jessica Simon]

2. *Phase 2: October, 2014-November, 2014*

Application deadline [Tyrone Collins and Jessica Simon]
Application review to identify which students will be selected to attend [Project Team]
Confirm attendance from 9th and 10th graders [Tyrone Collins and Jessica Simon]
Procure existing female College of Engineering students to volunteer at the event [Leigha Compson]
Organize event materials (e.g., nametags, lunch, agenda, etc.) [Leigha Compson and Jill Trinklein]

3. *Phase 3: Event Day and Beyond*

Welcome Speaker and Students [Leigha Compson]
TEA Event and hands-on activity [Project Team]
Breakout Session: Preparing for College Presentation [Jessica Simon]
Breakout Session: Opportunities for Women in Technology and Engineering at Ferris [Leigha Compson]
Campus Tour and Application Process to Ferris [Jill Trinklein]
Administer Feedback/Evaluation [Leigha Compson]
Follow up with Students to maintain contact [Leigha Compson and Jill Trinklein]

e. *Audience:* The audience for the event includes ninth and tenth grade females along with a female caretaker. In other words, all participants are encouraged to bring their mothers, grandmothers, or female caretaker. Involving female caretakers in the event increases the depth of reach to the student by informing the caretakers of the incredible opportunities in technology and engineering fields so they may in turn further encourage the female student to consider such a career after the event. Such focus on involving family and community members serves a secondary purpose of creating support to challenge professional stereotypes and encourage females in nontraditional careers. The workshop has the capacity to support up to 40 female student-female caretaker teams, for a total of 80 participants. These 80 participants are in addition to the current students, faculty and staff who would participate. There will be ten slots available for existing female student volunteers. In marketing the event, the focus will be on students in Detroit public schools as well as students locally in Mecosta and Osceola counties. To apply for attendance, students will need to complete a brief application. Priority will be given to students who have at least a 2.5 grade point average and who have been recommended by their teachers. Teachers will be encouraged to endorse more than one student.

f. *Impact:* The expected impact this event would have upon Ferris is multi-faceted as outlined below according to the beneficiary. Beneficiaries: 1) **9th and 10th grade students:** Exposure to successful female role models to consider high wage, high demand careers in STEM, hands-on learning experiences to further develop skills and interest in STEM fields, connection to Ferris programs to facilitate building a vision for the future after high school, opportunity to learn more about Ferris programs and admission requirements to encourage young women to take courses in high school to support future enrollment at Ferris, 2) **Female Guardians of the students:** Exposure to successful female role models that challenge gender stereotypes to emphasize the importance of academic achievement, and allow the opportunity to learn more about Ferris programs and admission requirements to encourage young women to take courses in high school to support future enrollment at Ferris, 3) **Ferris State University:** Outreach to underrepresented populations to serve as a recruitment platform to seek to increase the diversity of students, opportunity for positive marketing through activities to support education for underrepresented populations, support of existing female students to connect them to role models and opportunities for the future to encourage retention 4) **Existing CET female students:** Exposure to successful female role models to support retention efforts, opportunity to serve as role models to help underrepresented populations “imagine more” as they continue through high school, connections to nontraditional peers and staff to further develop support systems for retention. 5) **K-12 School Districts:** The cost of the workshop includes four Teaching Engineering Made Easy Resource Kits (to be awarded based on the top four schools with the highest number of students attending), securing a relationship with Ferris to learn more about programs and job opportunities to in turn share with K-12 students and ultimately support enrollment at Ferris.

g. Evaluation: An evaluation will be distributed prior to the closing of the event to track participant perceptions, effectiveness of role models, speakers, and the hands-on lab activities. Following the event, contact will be maintained with participants to continue to forge the relationship with Ferris so that students may consider applying to the CET when they are eligible. Data will be tracked so that it can be determined how many of the students follow-through with applications and ongoing communication with the College.

References

Engineering Emergency: African Americans and Hispanics Lack Pathways to Engineering. (2014). Vital Signs: Reports on the conditions of STEM learning in the U.S. Retrieved from <http://changetheequation.org/Engineering-Emergency>

Fishman, H. (2007). The female factor: Best practices for recruiting women. National Underwriter Life & Health Magazine. Retrieved from <http://www.lifehealthpro.com/2007/07/22/the-female-factor-best-practices-for-recruiting-wo>.

Mamaril, N. J.A. & Royal, K.D. (2008). Women and minorities in engineering: A review of the literature. Presentation Paper at 2008 Mid-western Educational Research Association. Columbus, OH.

Milgram, D. (2009). How to recruit female role models!. Retrieved from <http://www.iwitss.org/blog/tag/role-models>.

Tsui, L. (2009). Recruiting females into male dominated programs: Effective strategies and approaches. Journal of College Admission, 9-13.

VI. Budget

a. Anticipated expenses (itemize and briefly explain).

\$1465.00: \$700.00 will be reserved to support Ms. Baine's travel from her office location in Oregon. This would include round trip airfare and her stay at a hotel. \$765.00 will be reserved to help students with the transportation costs to Ferris. We expect to attract participants from the Detroit and Saginaw/Bay City areas given that the two admissions contacts will be heavily marketing the events in their respective territories to underrepresented populations. We therefore would like to provide at least two, ten passenger vans to pick up students in Detroit and Bay City. The cost was calculated based on the Motor Pool rate of two vans multiplied by the mileage as well as the additional cost for the driver per van.

\$450.00: Lunch for all participants at the Rock based on the rate offered to admissions and snacks to offer participants in the morning and afternoon.

\$50.00: Printing and duplication costs to prepare agendas, schedules, application materials, and the evaluation forms.

\$450.00: Promotional materials to market the event and provide giveaways for participants to remember Ferris to encourage future application.

\$100.00: Supplies such as event signs to guide attendees the day of the event and supporting materials for the labs (e.g., paper towels, disinfectant, etc.)

\$90: Resource materials are a flat shipping and handling rate of \$90 as part of Ms. Baine's seminar.

\$4195: The flat rate for hosting the conference, which includes the basic lab materials, t-shirts for each participant, a book for each student, a take-home lab kit for each student, and resource kits for four K-12 schools.

Total Anticipated Expenses: \$6800

b. Funds anticipated from other sources (please list).

\$1000 will be provided by admissions

\$800 will be provided by the College of Engineering Technology

Note that in-kind donations have not been accounted for specifically, but they certainly will be a key aspect to making this event successful.

Total Funds Anticipated from Other Sources: \$1800

c. Total amount requested from Faculty and Staff Diversity Mini-Grant. \$5000

	Requested Grant Funds	Funding from other sources	TOTAL BUDGET
STIPEND	0		
HONORARIA	0		
TRAVEL			1465
a) Ms. Baine-air	550		
b) Ms. Baine - hotel	150		
c) Travel scholarships	765		
FOOD		350	450
Lunch		100	
RENTALS	0	0	0
PRINTING & DUPLICATING	50	0	50
PROMOTION	100	350	450
SUPPLIES & POSTAGE	100		100
RESOURCE MATERIALS	90		90
ASSESSMENT TOOLS			
OTHER: TEAs Curriculum*	3195	1000	4195
TOTAL	5000	1800	6800
		6800	6800

VI. Final Report

A final report is required and it will appear on the Diversity Office's website. That report is due no later than three months after the funded activity. The final report should address:

- a: A self-evaluation
- b: Results of the event assessment
- c: Attendance figures
- d: Final budget

Applicants' Signatures:

Supreme Collier
Deight Compton
Jessica Simon
John Little
John Little

Submission Date: 3/31/14

Submit applications to Patty Terryn, Diversity and Inclusion Office, CSS 312. Review of applications will begin upon receipt and continue contingent on available funds. At the committee's discretion, applicants may be asked to participate in a brief interview to better explain their proposal.