Details of 2017 RET Site

Title: **RET Site on "Challenge-Based Learning and Engineering Design Process Enhanced Research Experiences for Middle and High School In-Service Teachers."**

RET Site Dates for 2017:   June 12th – July 27th , 2017

Website: https://www.ceas3.uc.edu/ret/archive/2017/ret/

RET Research Projects

> **Project 1:** **"Synthesis and Characterization of Different Forms of Cu Nanoparticles to Mitigate Cu Leaching to Water Bodies"**
> **Project 2:** **"Energy Storage Devices Based on Three Dimensional (3D) Graphene: Case Supercapacitors and Lithium–Sulfur (Li-S) Batteries"**
> **Project 3:** **"Bio-Inspired Optimization of the Multiple Traveling Salesman Problem"**
> **Project 4:** **"Air Quality Monitoring and Emissions Characterization Near a Major Railyard"**

RET Benefits for Teachers
1. Stipend for teachers: Each teacher will be paid $3,500 by the end of the summer 7-week RET program; $1,000 ($500/meeting) after reporting for the two school-year Community of Practice (COP) reflection meetings (planned for mid-January and mid-March); $1,000 after submitting the completed Unit template, post-RET Unit poster, and movie approved for web implementation; and $500 after presentation at the regional STEM Conference. Total $6,000/teacher.
2. Parking Fees: Costs for parking fees for 7 summer weeks and additional parking fees needed for events on campus during academic year. Teachers will receive a summer parking pass and individual parking passes per event.
3. Support for Post-RET classroom implementation by teacher = $200/teacher for supplies.
4. A laptop computer with wireless capability and essential software and case will be given to each teacher during their RET participation and for implementation of Post-RET activity. The laptops will be retained by those participants continuing with the project into the next school year.
5. Registration for the annual STEM Conference: $25/teacher for the registration cost for the conference.
6. Funds for substitute teacher to release RET participant to attend the one-day regional STEM Conference: $75/teacher is estimated.
7. Publication and Presentation Incentive Travel Funds for Teachers: The NSF budget requested includes $500/year/teacher for presenting a poster and $1,000/year/teacher for presenting a paper at a regional/national conference (other than the CEEMS Annual STEM Conference). Only 1 teacher author or co-author per poster or paper presentation will be allowed to avail this opportunity, if multiple co-authors are listed. Funds are budgeted for the first 2 teachers/year that have an accepted poster and first 2 teachers/year that have an accepted paper presentation.
8. Instructional Support for Engineering Foundation Professional Development Program for Teachers: Participants will take a week long workshop on, Engineering Foundations, at the start of the RET Site that immerses them in the engineering design process, challenge-based learning pedagogy, and introduces them to the different disciplines of engineering and the career opportunities in each.
9. Coaching and Resource/Review Support for the Teachers: A dedicated RET Resource Person (RRP), an experienced retired K-12 education specialist, will be obtained to share the responsibility with the RET participants for developing and testing curriculum design (i.e., Units), teaching techniques, and student learning modalities. The primary responsibility of this person is materials co-creation, review, critiquing and collection from the RET participants, and coordinating the summer seminars and workshops planned to assist the teachers in production of their deliverables.
10. In-Class UC Engineering Student Support for the Teachers: A Choose Ohio First Scholarship Program (COFSP) Fellow (senior undergraduate engineering student), who has received professional development on Challenge-Based Learning and Engineering Design Process teaching methods, will be available to devote 6 hours per week in the teacher's classrooms, with additional preparation time of 4 hours per week.