University of Kentucky PEIK Summer Energy Experiences Course Program 2015 [DRAFT]

(Summer Session I: EE599, EGR599, BAE599, and EGR649 – 3 credits)

Synopsis:

The Summer Power Experiences Program 2015 at the University of Kentucky is a 3 credit class that includes a five day traveling education program where students gain exposure to power and energy oriented facilities with technical tours and presentations from industry engineers and operators. Planned site visits include facilities for wind, solar, hydro, supercritical coal, gas turbine, pumped storage, transmission control center, smart grid demonstration site, and power distribution site. (Some of these sites are still in the planning stage, but have been visited in past versions of this course.) Students will have preliminary online assignments and coursework regarding the technologies at these sites prior to the visits. During the weeklong intensive portion with the visits, students will be away from campus, traveling between and visiting these different energy sites on chartered bus.

The program is being offered as a credit course through the University of Kentucky, in partnership with area industries and utilities. The program is also available to a limited number of students from institutions in the FEEDER consortium of universities. The FEEDER institutions include Auburn University, Florida State University, University of Arkansas, University of Central Florida, University of Florida, University of Kentucky, University of Pittsburgh, and University of South Carolina. The FEEDER consortium of universities is funded by the US Dept. of Energy. The students participating under the FEEDER program may participate as registered students for credit, or without credit but supported by the FEEDER grant. More information for these students is listed below.

Course Schedule:

Online content prior to May 18. During the week of May 11, students will be assigned readings, videos, and preparatory assignments.

Immersive Class Experience: May 18 (Monday) through May 22 (Friday) (with required orientation the afternoon of Sunday May 17). The class will visit energy sites via a chartered bus. The class will depart campus on the morning of Monday May 18 and not return to campus until Friday May 22. Overnight stays are covered as a part of the program during this period. More details on the schedule of the immersive experience schedule and the covered expenses are given later in this document.

Post-visit assignment: Students will be required to journal regarding the industry visits. The journal will be due to be submitted during the week after the intensive week.
**Background:**

The University of Kentucky developed the EE649 Energy Experiences class in 2011 through the support of the US Department of Energy. From 2011 through 2014, the program was a three credit hour course held over a semester as EGR649, with visits to company facilities throughout each spring semester offering. The Summer 2015 Energy Experiences program is a modified version of the original EGR649, with most plant visits concentrated during one week in the summer.

Prerequisites: The course is open to both undergraduate students and graduate students in engineering. Students should have had some prior coursework related to power or energy.

**Credit:**

**For students at University of Kentucky:** Students at the University of Kentucky will participate in the program as students registered for a three-credit hour course (either as EE599, EGR599, BAE599, or EGR649). Students taking the course for credit from the University of Kentucky are required to complete all assignments prior to the program. During the program, students are required to keep a journal about the visits, and this journal is to be submitted for a grade at the end of the course.

**For students from FEEDER consortium member universities:** Partner institutions in the FEEDER consortium may send a limited number of students to participate in the program under the US Dept. of Energy funded FEEDER grant. These students from partner institutions have three options for participation in this program. (1) They may attend the program under FEEDER sponsorship without receiving any course credit, or (2) they may seek credit through their home institutions with proper approvals and arrangements with their own faculty for all grading and assignments, (3) they may register with the University of Kentucky for credit from the University of Kentucky.

FEEDER students registering for credit at the University of Kentucky will pay tuition to the University of Kentucky. These students should be able to register at in-state tuition rates, under a University of Kentucky summer “distance learning” policy. Approvals for this are pending. Students would be admitted into the University of Kentucky as “non-degree visiting students” with an expedited application process. Students from FEEDER institutions who wish to pursue this should coordinate through the FEEDER faculty representative at their home institution. *(FEEDER faculty representatives must report student information to Larry Holloway, holloway@uky.edu, no later than noon on Friday April 24.)*
**Draft Schedule:**

Prior to travel program: Students will be provided with reading materials to prepare for the travel program. Students will be required to complete assignments over the preparatory material, including homeworks or quizzes, prior to departure.

*Note that this is a DRAFT SCHEDULE. Discussions are still taking place with partner industries to coordinate the visits. It is possible that a few of the planned visits may not take place, in which case UK can substitute in alternatives.*

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**Notice:** The proposed schedule is listed below, and includes either four days or five days of travel and visits, covering as many as nine different energy sites over five days. Each day will also include several hours of travel on a bus. The schedule is aggressive. Students attending this should plan on being well rested before the trip, as the schedule could be very tiring.

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**Beginning of UK program:**

**Sunday May 17, late afternoon** (approximately 3:30pm): Kickoff meeting to be held at the Lexington hotel site. This will include safety training, establishment of expectations, and overview of the week.

**Monday May 18: (Tentative plan)**

- Start at UK campus, and also pickup at student hotel. [Note: coordinate with UK for five day parking passes if needed by students.]
- Bluegrass Energy (Nicholasville KY): Power substation and distribution site  
  - [travel to next: 98 miles, travel time: 1:37]
  - [Potential alternatives:  
    - KU Brown plant (Harrodsburg)  
    - KAEC Transformer Manufacturing (Louisville, KY)]
- Overnight in Louisville, KY

**Tuesday May 19: (Tentative plan)**

- Falls of the Ohio (Louisville KY): Hydroelectric  
  - [travel to next: 50 miles, 1 hour]
- Trimble Power Plant (Trimble County, KY)
- [Overnight in Indiana,  
  - potentially Seymour Indiana, 56 miles, one hour and 12 minutes away]  
  - potentially Columbus Indiana, 74 miles, one hour and 25 minutes away]
**Wednesday May 20 (Tentative plan)**

- Wind Farm in Chalmers Indiana  
  - [travel from Seymour Indiana to Chalmers: 140 miles, 2 hours 5 minutes. Better if closer.]
- Potential other visit: MISO in Indianapolis
- [Overnight near Cincinnati]  
  - Chalmers to Cincinnati area: 190 miles, 2 hours and 50 minutes

**Thursday May 21 (Tentative plan)**

- Duke Envision Center (Erlanger Kentucky): Demonstration and Education Center for Smart Grid  
- EKPC Bavarian Landfill Gas Power (Walton, Kentucky)
- *Option for students who choose to end the program in Chattanooga, not Lexington:*
  - Students (particularly from FEEDER institutions) who have their own vehicle and want to end their program in Chattanooga will pick up their vehicles in Lexington and continue on to the overnight stop in their own vehicles. (Bavarian waste to Lexington is 1 hr. 6 min, 65 miles)
  - All students overnight near Knoxville Tennessee. (2 hrs 35 minutes to Lexington to Knoxville.)

**Friday May 22 (Tentative plan)**

- TVA: Raccoon Mountain Pumped Storage facility (near Chattanooga)
- Three options for a second visit with TVA:  
  - Option 1: TVA Bellefonte Nuclear plant (near Chattanooga): Plant under construction but not fueled, so fantastic experience.
  - Option 2: TVA Control Center (Chattanooga): Transmission and generation control center.
  - Option 3: TVA Sequoia Nuclear plant (near Chattanooga): This is an operational nuclear plant. Due to heavy security and radiation safety, this is not as satisfying an option as the Bellefonte Nuclear.

- Visit concludes.  
  - Students returning to Lexington: The bus will return to Lexington, arriving late evening. Any students flying from Lexington the following day will be dropped at a hotel near the Chattanooga airport. They will be responsible for their own lodging on Friday evening.
  - Students not returning from Lexington:  
    - Students who are traveling in their own cars can depart from Chattanooga.
    - Students who are flying will be dropped off at a hotel near the Chattanooga airport. They will be responsible for their own lodging on Friday evening.
Other information:

- **Security approvals:** Some sites, such as Fort Knox and some TVA locations, require security approvals. Students will be required to provide copies of their identification in advance of the visits. For US citizens, identification will be drivers licenses. For international students, required identification in the past has been passports and visas. Students will be required to bring their original documents (drivers licenses, passports, and visas) with them on their visits.

- **Shoes:** Students will be required to wear closed-toed shoes. (Further instruction may follow, based on any additional requirements of the energy sites.)

- **Clothing:** Students will be required to wear long pants at all sites. Shirts must be appropriate for industry wear. Shirts should be modest and in good taste. (Shoulders should be covered, and t-shirts with imprints and slogans should be avoided).

- **Safety equipment:** The University of Kentucky will provide hardhats, safety glasses, and hearing protection for all participants.

- **Hotels:** Hotels will be scheduled from Sunday evening through Thursday evening. Hotel rooms will be double occupancy, separated as male or female. Students may request their hotel partner in advance. (A deadline for the request will be given.) Otherwise, the student roommates will be assigned randomly, by male or by female. Hotels for Friday are the responsibility of the participants.

- **Meals:** All hotels during the travels will have breakfast included. Students will be responsible for all other meals. Lunches will typically be at fast food restaurants. Dinners will typically be at a regular restaurant, such as an Applebee’s, Cracker Barrel, etc. Students should budget accordingly. (The student’s home institution may choose to cover meal costs such as through per-diem reimbursement through grant funding. However, the University of Kentucky will not cover meals.)

- **Transportation during the program:** Transportation during the program will be on chartered bus. A bus with Wi-Fi will be arranged if possible.

- **Transportation prior to the program:** The program will begin in Lexington the late afternoon of Sunday May 17. Students should plan to be in Lexington for the starting briefing by 3:30pm (tentative time) on May 17. Lodging for the night of May 17 will be at a hotel that provides pickup service at the Lexington Kentucky airport, in case students fly into Lexington. For students who drive to Lexington, parking arrangements will be made for their car during the bus travel days.

- **Transportation after the program:** The program will complete final visits in the Chattanooga Tennessee area on the afternoon of Friday May 22. The bus will return to Lexington that evening.
  - Students from other institutions who drive may choose to pick up their car in Lexington on Thursday, drive to the Thursday lodging, and then to the Friday site visits. They may then leave the program after the Friday site visits in the Chattanooga area.
  - Students from other institutions who fly could leave from either Lexington airport or Chattanooga airport. If students have flights leaving from Chattanooga for Saturday May 23, they will be dropped at a hotel near the Chattanooga airport. If students will fly
from Lexington on Saturday May 23, they will be dropped at a hotel near the Lexington airport.

- **Expenses:** The program expenses covered through UK include hotel, bus, and coordinating instructor. This is for students who register with UK for tuition, and also for the limited positions available to students from FEEDER partner institutions.
  
The participants are responsible for: all meals (except for breakfasts provided by the hotels); transportation prior to and after the program; and hotel expense on Friday night if needed.