**An Overview of the RET** Site, Expectations and Work Dr. Anant R. Kukreti **Associate Dean & Professor Department of Civil and Environmental Engineering Engineering University of Cincinnati** June 23, 2008

## PRESESENTATION OUTLINE

- Introductions
- Project Office and Contact Information
- Other Project Participants
- Research Project Titles and Participants
- Goals of the RET Site Activities
- RET Site Activities
- Laboratory and Office Usage and Safety Issues

## RET PROJECT OFFICE and CONTACT INFORMATION

### Project Offices

Baldwin Hall 746 & 747

#### Project Director

- Dr. Anant R. Kukreti
- Office: ERC 701F
- Phone: 513-556-4105
- E-Mail: anant.kukreti@uc.edu

#### General Help Contact

- Ms. Andrea Burrows (RET Coord.)
- Office: 5506 French Hall
- Phone: 513-556-1029, 407-963-6818
- E-Mail: Andrea.burrows@uc.edu

#### Financial Reimbursement Contact Staff Assistant

- Ms. Mary Ann Schaefer
- Office: Baldwin Hall, Room 765
- Phone: 513-556-3630
- E-Mail: schaefmy@ucmail.uc.edu

#### Computer Help

Mr. Ken Maxwell Office: 5508 French Hall Phone:513-307-3382 (C) E-Mail: maxwelljrj@gmail.com

Ms. Christine Johnson Office: Baldwin Hall 665 & ERC 701 Phone: 513-556-1164 E-Mail: christine.johnson@uc.edu

## **OTHER RET PROJECT PARTICIPANTS**

#### College of Engineering Research & Education Faculty

- Dr. George Sorial (CEE-Water)
- Dr. Jandro Abot (ME-NanoMat)
- Dr. Heng Wei (CEE-Trans)
- Dr. Anant Kukreti (CEE-EarthQk)
- Dr. Vesselin Shanov (CME-Energy)
- Dr. Mingming Lu (CEE-BioDiesel)
- Dr. Kelly Cohen (AE-EarthQk)
- Mr. Eugene Rutz (CoE-PreEng Course)

#### College of Education & Evaluation Services Center Faculty

- Dr. Glenn Markle (CECH)
- Dr. Catherine Maltbie (ESC)

#### Graduate Assistants

- Hafiz Salih (Env-Water)
- Yi Song (Mech-NonoMat)
- Vijay K. Nemalapuri (CE-Trans)
- Ravitaja Chalasani (CE-EarthQk)
- Sanooj S. Edalalth (CE-EarthQk)

#### NSF STEP Graduate Fellows

- Mr. Amr Safwat
- Mr. Mike Borowczak
- Mr. Chris Korte

Dr. Jon Breiner (CECH/A&S)

Dr. Deborah Zorn (ESC)

Feng Wang (Materials-Energy) Ming Chai (Env-BioDiesel) Zhuo Yao (CE-Trans) Chelsea Sabo (AE-EarthQk) Nick Hanlon (AE-EarthQk)

Ms. Chelsea Sabo Mr. Nick Hanlon

# Project # 1: "Availability of Safe Drinking Water"

### Teacher Participants

- Ms. Melissa Stoltz, Jones Middle School, KY
- Mr. Kurt Whitford, Glen Este High School, OH

- Dr. George A. Sorial, Professor, Department of Civil and Environmental Engineering George.Sorial@uc.edu, 756F Baldwin Hall, 513-556-2987, 513-515-4473 (C)
- Graduate Student Mentor
  - Mr. Hafiz Salih, salihhh@email.uc.edu, 709 Rhodes Hall, 513-382-5480 (C)

## Project # 2: "Renewable Energy System"

### Teacher Participants

- Mr. Jon Souders, Glen Este High School, OH
- Mr. Philip Metcatilli, Pre-service teacher

- Dr. Vesselin Shanov, Associate Professor, Department of Chemical and Materials Engineering, vesselin.shanov@uc.edu. 578 Engineering Research Center, 513-556-2461
- Graduate Student Mentor
  - Mr. Feng Wang, wangf4@email.uc.edu, 602 Rhodes Hall, 513-373-2271

## Project # 3: "Nanostructured Composite Materials "

- Teacher Participants
  - Mr. Michael Day, Reading High School, OH
  - Ms. Sarah Woodward, Career Tech

- Dr. Jandro L. Abot, Assistant Professor, Department of Aerospace Engineering, j.abot@uc.edu, 727 Rhodes Hall, 513-556-3557
- Graduate Student Mentor
  - Mr. Yi Song, songyi@email.uc.edu, 500 Rhodes Hall, 513-432-5423

## Project # 4: "Measurement of Air Pollutant Emissions from Biodiesel Blends"

### Teacher Participants

- Ms. Peggy Dunn, Newport High School, KY
- Ms. Katie Godby, Jones Middle School, KY

- Dr. Mingming Lu, Associate Professor, Department of Civil and Environmental Engineering, Mingming.Lu@uc.edu, 797 Rhodes Hal, 513-556-0996
- Graduate Student Mentor
  - Mr. Ming Chai; chaim@email.uc.edu, 709 ERC or 791 ERC, 513-236-9071 (C)

### Project # 5: "Measuring Travel Time Reliability of Transportation Systems"

#### Teacher Participants

- Mr. Brad Hunt, Norwood High School, OH
- Ms. Kate Kulesa, Pre-service teacher
- Faculty Mentor
  - Dr. Heng Wei, Assistant Professor, Department of Civil and Environmental Engineering, heng.wei@uc.edu, 792 Rhodes Hall, 513-556-3781

#### Graduate Student Mentors

- Mr. Vijay Krishna Nemalapuri, nemalava@email.uc.edu, 735 ERC, 513-488-0158
- Mr. Zhuo Yao, yaozo@email.uc.edu, 735 ERC, 513-382-6110

#### Project # 6: "Buildings that Resist Earthquakes Better"

- <u>Teacher Participants</u>
  - Grant Keys, Winton Woods High School, OH
  - Rachel Rice, Pre-service teacher
- Faculty Mentors
  - Dr. Kelly Cohen, Associate Professor, Department of Aerospace Engineering, Kelly.Cohen@uc.edu, 732 Rhodes Hall. 513-556-3523
  - Dr. Anant R. Kukreti, Professor, Department of Civil and Environmental Engineering, Anant.kukreti@uc.edu, 701F Engineering Research Center, 513-556-4105

#### Graduate Student Mentors

- Ms. Chelsea Sabo; sabocm@email.uc.edu, 518 Old Chem, 207-730-2256 (C)
- Mr. Nick Hanlon; hanlonnp@email.uc.edu
- Mr. Raviteja Chalasani, chalasr@email.uc.edu, 542 Baldwin Hall, 513-729-6105, 208-867-9520 (C)
- Mr. Sanooj Sadique Edalalth, edalalse@email.uc.edu, 542 Baldwin Hall, 513-746-5783

## **GOALS OF THE RET SITE ACTIVITIES**

- Goal 1: Explore the scientific method of inquiry and the critical research skills that engineers use to solve open-ended real-world problems.
- Goal 2: Teachers will become role models by applying their research experiences in their classrooms and with colleagues.
- Goal 3: Teachers' new skills will enable students to directly link their education to events and issues occurring within their community and encourage them to become effective citizens in a technology-driven society.



## **RET SITE ACTIVITIES: RESEARCH**

Week 1: Identify Goals, Tasks, Schedule, Conduct Literature Search, and Learn Research Tools

Weeks 2-5: Complete Literature Search, Test, Synthesize, Analyze, and Generalize Results

## RESEARCH (8:00 am to Noon)

Week 6: Wrap-Up for Final Deliverables

Project Deliverables:
1. Bi-weekly typed Research
Report & PP Presentation
2. Final typed Research
Report, PP Presentation & Poster

# **RET SITE ACTIVITIES:** PROFESSIONAL DEVELOPMENT - SEMINARS

**Five Skills Workshops:** Technical Writing & Presentation, Literature Search, Ethics, Poster Making (2) & Research to Lessons (2)

PROFESSIONAL DEVELOPMENT (8:00 to Noon (some) & 1:00 to 5:00 pm) **Nine Education Seminars** by Education Faculty on Inquiry Learning, Assessment, and Publication & Funding Opportunities

Seven Professional Engineering Workshop

by Engineering Faculty & Professional Engineers to Showcase How Engineers Use Math and Science

**<u>Three Field Trips</u> to Engineering Sites** 

## **RET SITE ACTIVITIES:** PROFESSIONAL DEVELOPMENT - INTERACTION WITH STEP

## PROFESSIONAL DEVELOPMENT (1:00 to 5:00 pm)

28 One Hour Sessions for a Pre-Engineering Course

Three 1.5 hour Interactive Sessions: With STEP Fellows on Lesson Development

# **RET SITE ACTIVITIES : PROFESSIONAL DEVELOPMENT - DELIVERABLES**

## PROFESSIONAL DEVELOPMENT (1:00 to 5:00 pm)

**Biweekly Written Reports & PP Presentations** 

 (1) Research Report and
 (2) Classroom Implementation Plan from Research & PD Experience

Final Written Reports & PP Presentations

(1) Research Report and (2) Classroom Implementation Plan from Research & PD Experience

**Display Posters** for (1) Research Project and (2) Classroom Implementation Plan

Workshop & Seminar Reflective Reports By Respective Project Teams

# **RET SITE ACTIVITIES: Reflective Reporting**

Each participant will submit a weekly reflective feedback on Friday, before noon – time set aside for it (unless indicated differently in the RET Calendar)

## E-mail to:

- Grant coordinator (Burrows) at Andrea.burrows@uc.edu
- Evaluation Coordinator (Maltbie) at cathy.maltbie@uc.edu
- Project Director (Kukreti) at anant.kukreti@uc.edu)
- Research Faculty Mentor for your project (E-mail address given earlier)

# **RET SITE ACTIVITIES:** Summary of **Deliverables - Reports & Presentations**

#### Interim Progress Reports & Presentations:

- Separate Bi-weekly Progress Reports on "Research" and "Classroom Implementation Plan" due on alternative weeks (July 2 & July 17)
- Typed reports:
  - <u>Research Report</u> to : Project Director (Kukreti) & Research Faculty Mentor
  - <u>Classroom Implementation Plan Report</u> to Project Director (Kukreti) & Education PD Coordinators (Glenn Markle at glenn.markle@uc.edu and Jon Breiner at jon.breiner@uc.edu)
- PowerPoint presentations:
  - Research: 1:00 to 2:30 pm
  - Classroom Implementation Plan: 2:30 to 4:00 pm
- Social hour with refreshments: 4:00 to 5:00 pm

## **RET SITE ACTIVITIES:** Summary of Deliverables (Cont.' d) – Final Reports & Presentations

- Final Research Report, Classroom Implementation Plan, and Poster Presentations
  - Four copies of Research Report and Classroom Implementation Plan due on Wednesday, July 29 at 10:00 a.m. for distribution to the Judges
  - Final Day Presentations, Friday, July 31
    - Poster presentation, <u>8:00 to 10:00 a.m.</u>
    - Research presentation, 10:00 a.m. to 12:00 (20 minute presentation + 5 minutes questions)
    - Classroom Implementation Plan presentation, <u>1:00 to 3:00 p.m.</u> (20 minute presentation + 5 minutes questions)

## **RET SITE ACTIVITIES:** Field Trips

Cincinnati Waterworks, Cincinnati, July
 8: Dr. Sorial

ARTIMIS Lab, Cincinnati, July 15: Dr. Wei

Hamilton County Department of Environmental Services Labs, Cincinnati, July 22: Dr. Lu

## **RET Site Activities:** Workshop, Seminar & Field Trip Reports

- A designated project group will prepare a reflective write-up on the experience
- Describe the topics covered covered and lessons learned (must have sufficient details)
- The report must be <u>submitted within a week</u> after the delivery of the workshop or seminar
- E-mail the report to:
  - Anant Kukreti at anant.kukreti@uc.edu
  - Andrea Burrows at Andrea.burrows@uc.edu
  - Ken Maxwell at maxwelljrj@gmail.com

# **RET SITE ACTIVITIES:** Summer Stipends & Awards

- Stipend: \$4,500 for in-service teachers and \$2,000 for pre-service teachers (for both paid at end)
- Laptop, case, and Flash Drive (on loan until Post-RET completion)
- Four CEU credits awarded for summer RET experience
- Parking at UC for 6 weeks (\$112.50/teacher)
- Certificate awarded to each participant
- \$200 support presentation at a regional or national professional meeting to showcase RET experience

## **RET SITE ACTIVITIES:** Post RET Activities

- <u>At least one lesson</u> from RET experience presented preferably in fall of 2009, but no later than February 26, 2010, which needs to be observed (teacher arranges it)
- Material for web display of lesson: Text material for the lesson sent to the STEP Grant Coordinator in electronic form by March 5, 2010
- \$200/teacher available for project supplies for this implementation need all receipts
- Focus group on-campus meetings with evaluator (two): Mid-December and Mid-March
- One-page intermediate progress report submitted at each of the above meeting
- Submit five-page <u>final reflective report</u> by May 28, 2010
- Teacher stipend: Total = \$1,500 for in-service teachers and \$1,000 for pre-service teachers – payment timings will be tied to above deliverables

## **REU Site Activities:** Awards

Certificate for each participant
 "Best Project" selected by Judges

# **RET Lesson Web Template**

#### Title of the activity

|   | Lesson<br>Information              | Summary                   |   |
|---|------------------------------------|---------------------------|---|
|   | Grade Level                        |                           | / |
|   | Subject areas                      |                           |   |
|   | Duration                           |                           |   |
|   | Setting                            |                           |   |
|   | Materials                          | Objectives                |   |
|   | Background<br>Knowledge            |                           |   |
|   | Lesson Plan(s) for<br>the Activity |                           |   |
|   | Additional<br>Resources            | Ohio Standards<br>Science |   |
|   |                                    | Math                      |   |
|   |                                    | Technology                |   |
|   |                                    |                           |   |
|   |                                    |                           |   |
| L |                                    | 1                         |   |

# **RET Lesson Web Template**

#### Project STEP Cincinnati www.eng.uc.edu/STEP Viva Las Vegas - An Energy Project Hughes Center High School- Paideia Program Spring 2003 Lesson Information Summary Students act as representatives from competing Grade Level energy production concerns attempting to sell the 9 Las Vegas City Council a new power plant. The students research their own power generation Subject areas technology, the technologies of other groups, and the Physical Science Las Vegas area, in order to write and present a Duration detailed report describing how their power plant will best fit the Las Vegas community. Students are Six to eleven 50-minute class periods required to learn not only the mechanical facts of A student presents her how power is generated, but also to evaluate the Setting costs and benefits of such generation. the class. Standard classroom Computer laboratory Objectives Materials Students will be able to: Approximately 50 books from library · Evaluate a power plant technology and its effects on a community. Poster materials • Demonstrate their ability to research, analyze, and evaluate a topic in a written report and a presentation. • Computer, w/ LCD projector **Ohio Standards** Background Knowledge From the Ohio Science Benchmarks: Students will need some Earth and Space Sciences experience with: watts, 1) Describe how Earth is made up of a series of interconnected systems and how a joules, energy, work, and change in one system affects other systems. energy transformations. 2) Explain that humans are an integral part of the Earth's system and the choices humans make today impact natural systems in the future. Additional Resources Physical Sciences http://users.rcn.com/agne 1) Demonstrate that energy can be considered to be either kinetic (motion) or ws/EnergyEfficiency.htm potential (stored). http://www.bls.gov/oco/ 2) Explain how energy may change form or be redistributed but the total quantity of ocos227.htm#outlook energy is conserved. www.howstuffworks.co Science and Technology m 1) Explain the ways in which the processes of technological design respond to the www.doe.gov needs of society. Many other websites 2) Explain that science and technology are interdependent; each drives the other. 3) Predict how human choices today will determine the quality and quantity of life on Earth **Developed by Fellows:** 4) Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety, aesthetics). Matthew Barber Scientific Ways of Knowing Nicholas Harth 1) Explain how societal issues and considerations affect the progress of science and technology.

research on wind power to

## Laboratory and Office Usage and Safety

## Attire

- Closed toe shoes
- Full length pants
- Safety glasses, lab coats, and masks when needed
- Hard hats when needed
- Equipment training and usage
  - Provided by laboratory technician and/or Graduate Research Assistant prior to usage
  - No equipment should be used without receiving training
  - All tools borrowed should be returned before the end of the day

## Laboratory and Office Usage and Safety Issues (Continued)

# Never work alone when testing Use of Project Office

- Project Office should be kept clean on a daily basis - no exceptions
- Lock the room after leaving no exceptions

### Copy Machine Usage

- Limited printing (few pages only) must be done using RET Office printer
- For larger jobs use department Xerox machine in CEE Office, Baldwin Hall, Room 765
- RET Office laptop is configured for this printing

**QUESTIONS?**