Formative Assessment in Physics
PHY 5028
Seattle Pacific University

Dates:  (All Tuesdays)
1/10/12  1/24/12  2/7/12  2/21/12  3/6/12
4/3/12  4/24/12  5/8/12  5/22/12  6/5/12

Time:  5:30 PM – 8:00 PM

Instructors:  Lane Seeley, Associate Professor of Physics, Seattle Pacific University (seelel@spu.edu)
Stamatis Vokos, Professor of Physics, Seattle Pacific University (vokos@spu.edu)
Lezlie DeWater, Resident Master Teacher, Seattle Pacific University Department of
Physics and Seattle Public Schools (dewater@spu.edu)

Location:  Seattle Pacific University, Otto Miller Hall, room 138

Credits:  1-4 credits of PHY 5028, $45 per credit

CEU/Clock Hours:  0.5-3.0 CEU (1 Continuing Education Unit = 10 clock hours); $15 for 0.5 or 1.0 CEU;
$30 for 1.5 or 2.0 CEU; $45 for 2.5 or 3.0 CEU (see more information on CEU allocation below). CEU
course number depends on the number of clock hours.

Credit/Clock Hour Details:

This course is offered for credit or for clock hours. The number of credits or clock hours that may be
earned depends on attendance and participation.

Participants can earn up to 4 credits or 40 clock hours. Participants can earn one credit for every four
sessions attended, or five clock hours (0.5 CEUs) for every two sessions attended. (Clock hours will only be
awarded in increments of 5.)

Please also see the sections below on Assignments and Grades for more information on credit and clock hour
options.

We have arranged for end-date registration for all options, so you do not need to know in advance how many
sessions you will be able to attend; you can register in May for the appropriate number of credits or clock hours
based on your participation during the year.

Course Description:

This course for teachers can be taken either as a standalone course or as part of a two-year professional
development program. Participants may take this course multiple times, as activities and assignments,
which will be partially based on real-life scenarios in participants’ home classrooms, will vary from year
to year.

This course will provide for the continuing development and application of ideas about energy instruction
and formative assessment. Course activities will include presentations by instructors or special guests;
whole-group discussions in which instructors and participants present and reflect on energy content and
instructional strategies; and work in small groups.

Presentations by instructors and special guests may include:

- Introduction to the Diagnoser Tools (diagnoser.com) for formative assessment and targeted instructional intervention
- Presentations by instructors or guests on current studies of student learning about energy transfers and transformations, and/or the implementation and study of formative assessment strategies in K-12 classrooms
- Introduction to Science Curriculum Topic Study and associated resources for they study of science standards and student learning
- Presentations by guests whose work involves the study (and/or the implementation) of energy transfers and transformations
- Introduction to the Reformed Teaching Observation Protocol as a tool for reflection on constructivist classroom practice

Possible whole-group discussion topics include (but are not limited to):

- Reporting out of issues and findings from small group work
- Viewing and analyzing classroom video in order to practice informal assessment of student thinking
- Hearing from teachers who use Diagnoser Tools (diagnoser.com) regularly to explore strategies for using these tools and responding to the data that is generated
- Sharing examples of instructional strategies/lessons (e.g., discrepant events) and discussing implementation and assessment of student learning

This physics course is offered by Seattle Pacific University through the support of a National Science Foundation Discovery Research K-12 grant.

**Stipend:** $50 per session.

**Learning Objectives:**

Participants will:

- Increase skills in adapting instructional activities to identify and address student ideas
- Increase skills in implementing formative assessment strategies and responding to the results
- Enhance their understanding of energy concepts
- Identify and discuss examples of the flow of energy (transfers and transformations) in systems in the instructional materials they use with their pre-college students
- Explore student ideas about energy
- Explore and gain facility with instructional strategies that promote student understanding of energy

**Instructional Goals for Course:**

- Provide professional development that is consistent in content and delivery with standards and benchmarks in national science education documents
- Provide teachers with support in enhancing their own formative assessment practice
- Provide teachers with access to research on students’ conceptions related to the topic of energy
- Be informed by and consistent with what we know about how people learn (including what it
means to create learning communities that are learner-centered, knowledge-centered, and assessment-centered)

Curriculum: Course materials will be provided.

Assignments:

Participants taking the course for credits will assemble a portfolio of work for the course. The number of portfolio elements assigned depends on the number of credits for which the participant registers.

Portfolio elements should document the thinking of individual participants as it develops over the academic year. This could include (but is not limited to) collaborative thinking taking place in working groups, evolving thinking about specific content ideas, and the application of ideas (or plans for applications) to classroom practice. Participants may select portfolio elements from examples available online. Participants may also propose portfolio elements based on class discussions, working group assignments, or other inspirations.

Portfolio elements will be reviewed by course instructors; participants may be asked to re-submit elements for completeness or clarity.

Attendance: The number of credits or clock hours that may be earned depend on attendance and participation (see details above).

Grades:

Participants can earn up to 4 credits. Participants can earn one credit for every four sessions attended. All participants registering for credits are assigned portfolio elements; the number of portfolio elements assigned depends on the number of credits for which the participant registers. Grades are based on the number of complete and clear portfolio elements submitted (including resubmission if requested).

- For 4 credits: Attend and actively participate in all 16 course sessions
  - 16 or more elements will earn an A for the participant; 12 or more elements will earn a B; 8 or more will earn a C
  - Fewer than 8 elements results in a non-passing grade
- For 3 credits: Attend and actively participate in a minimum of 12 course sessions
  - 12 or more elements will earn an A for the participant; 9 or more will earn a B; 6 or more will earn a C
  - Fewer than 6 elements results in a non-passing grade
- For 2 credits: Attend and actively participate in a minimum of 8 course sessions
  - 8 or more elements will earn an A for the participant, 6 or more will earn a B, 4 or more will earn a C
  - Fewer than 4 elements results in a non-passing grade
- For 1 credit: Attend and actively participate in a minimum of 4 course sessions
  - 4 or more elements will earn an A for the participant, 3 will earn a B, 2 will earn a C
- Fewer than 2 elements results in a non-passing grade

*Non-cohort participants registering for clock hours:*

Clock hours are awarded based on attendance and active participation in course sessions. Participants may earn five clock hours (0.5 CEUs) for every two sessions attended. Clock hours will only be awarded in increments of 5.