BSSP Physics

2 credits

Syllabus | Fall 2009

Instructor: Irene Grimberg
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Email: Desire to Learn (D2L)

Purpose: To provide a general understanding of the Physics topics outlined in the Montana Standards for Science and the Essential Learning Expectations (OPI, 2009); and to facilitate their teaching through an Inquiry-based and cultural inclusion approach. The Physics content includes the concepts of Motion, Force, Energy, Electricity and Magnetism, Light, and Sound.

Description: This course will build on topics presented at the 10-day BSSP summer workshop in June 2009.

Readings:

a. Conceptual Physics by Paul Hewitt

b. Stop Faking It! Finally Understanding Science so You Can Teach It by William C. Robertson. NSTA Press.

c. SciPacks; online resources; NSTA.

Additional Reading will be provided on D2L or as links to WebPages

Course Goals: Knowledge gained from this class will:

- Help you to connect with the fundamental organization of the Physical world: Matter and waves, changes of matter and motion, forces, and energy.
- Allow you to teach these concepts to your students in an engaging way.
- Help you to find connections between Native American knowledge and practices and Physics.

Module Design: This course is designed in a module format. The course consists of 6 modules. Each model corresponds with topics that we will be discussing during each face-to-face meeting. Each module consists of:

1. **Dates:** Each module has opening and closing dates. Each module will close at 9:00 pm on a Sunday of the designated dates. Please pay attention to the dates, as students will be unable to enter the module once it is closed.

2. **Description:** Each module has a description of the module content and student activities.

3. **Module Sections:** Each module has four sections: two **Online Activities,** each one to be completed in one week**, Additional Resources for Your Classroom,** and **Inquiry Pedagogy.** Each module should be completed in two weeks. Your readings and activities are listed in your syllabus and are utilized in your discussions. Sometimes the activities will be based on the NSTA SciPacks units. "Additional Resources for Your Classroom" are generally practical resources for teaching your students. It may be helpful for you to print out or electronically file the resources and collect them in a portfolio folder to assist you in future teaching.

4. **Discussions:** Each module contains one or several discussion sections that relate to specific readings and activities. Students are expected to:

    1. **Read the assigned readings and complete all discussion questions and activities thoughtfully and thoroughly.**

    2. **Post you response as early as possible to provide ample time for others to respond to your posting.**

    3. **Read ALL of the discussion postings, not just the discussions responding to your posting. The discussion area is your "classroom" and it is important to follow the discussion threads as they represent the ideas and contributions of everyone in the class. Lack of participation affects everyone in the class.**

    4. **Actively ENGAGE in the discussions throughout the week. Posting your discussions on one day does not constitute "active engagement" in the course. Posting your discussions "at the last minute" does not qualify as a discussion as other students, nor your professor, can or will engage in a discussion with you.**

    5. **Respond to you instructor's questions that may specifically be posed to you in the discussions.**

6. **Use the HTML editor for spelling and grammar check, if necessary before posting your discussion.**

Reminder: The technology in the course allows the instructor to track each individual student's activity, including, student entry into the course or modules, number of postings and number of items read. **The modules will close at 9:00 pm on the designated dates. Students will not be able to enter them after that time.**

Email will be available through D2L. Students can communicate with the instructor or other students privately. The instructor will use email to contact students individually or as a group so please check your email regularly.

Grades: A grading scale is contained at the end of this syllabus.

Course Evaluations: Students are strongly encouraged to complete a course evaluation for each course. The course evaluations are found on the menu bar or on the home page for each syllabus. The course evaluations are anonymous as they are sent to the Burns Telecommunications Center. The Burns Center compiles the data and sends it to the instructors after the course is closed and grades are submitted.

The face-to-face meetings and the online topics will complement each other.

The Native American focus topics will be presented by invited speakers in the face-to-face workshops.

Topics of Face-to-Face Workshops and Online Modules

August

Face-to-face date: August 29

Native American Focus: Native American Art: light and shadows.

Science Focus:

Light characteristics: reflection, refraction, scattering and diffraction.

Color: white light spectrum by refraction (prisms); reflection, and diffraction.

Primary and secondary colors of light and pigments.

Pedagogy Focus: Ensure that all students learn science

Complete Online Module 1 between September 14 and 28.

<u>October</u>

Face-to-face date: October 3

Native American Focus: Sense of place and space

Science Focus:

Motion in one dimension: uniform motion and accelerated motions

Position, velocity and acceleration

Motion in two dimensions: parabolic and circular motions

Pedagogy Focus: How does linking instruction with assessment impact learning?

Complete Online Module 2 between September 28-Ocotber 12

Complete Online Module 3 between October 12-October 26.

<u>November</u>

Face-to-face date: November 7

Native American Focus: For power and protection, the use of shields

Science Focus:

Forces: types of forces and the concept of vector

Force diagrams

Newton's First, Second and Third Laws.

Pedagogy Focus: Instruction that supports scientific thinking

Complete Online Modules 4 between October 26-November 9

Complete Online Modules 5 November 9-November 23

December

Face-to-face date: December 5

Native American Focus: Rock walls and their role in large animals hunting.

Science Focus:

Mechanical energy: potential, and kinetic energy

Energy conservation

Pedagogy Focus: How is inquiry assessed in the classroom?

Complete online Module 6 between November 26- December 7.

Grading Scale

Posting and reading in all online Module discussions: 90 points

Posting and reading in all online SciPacks discussions: 90 points

Completion of the Physics SCOOP: 100 points

Participation in all face-to-face-meetings: 120 points

Total Points: 400 points

90 to 100% = A	80 to 89% = B	70 to 79% = C
60 to 69% = D	Less than 60 % = F	