OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE: May 2013
COURSE REVISED IMPLEMENTATION DATE:
COURSE TO BE REVIEWED: May 2019
(six years after UEC approval) *(month, year)*

OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

EDUC 437A	Faculty of Professional Studies/Education	1.5
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Designs for Learning Secondary Science (Biology/Earth Science focus)
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course provides a continuation of learning about fundamental pedagogical concepts and skills necessary for the effective teaching of secondary Senior Science courses (Biology and Earth Science focus). The B.C. provincial curriculum Integrated Resource Package (IRP) will be used as a focus for exploring diverse pedagogical strategies and students will develop lessons and units using pedagogical content knowledge as a conceptual framework. The course will explore the theory and practice of two pedagogical approaches: inquiry and direct instruction. Instruction will take place in a context of community-based science. Integration of science with other subject areas will be addressed and assessment in relation to science topics will be explored.

Note: Both EDUC 437A and EDUC 437B must be completed before credit can be obtained.

PREREQUISITES: Admission to the Teacher Education Program (TEP), EDUC 436
COREQUISITES:
PRE or COREQUISITES:

SYNONYMOUS COURSE(S):
(a) Replaces:
(b) Cross-listed with:
(c) Cannot take: for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: **23**

STRUCTURE OF HOURS:

Lectures:	**9**	Hrs
Seminar:	**5**	Hrs
Laboratory:	**9**	Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

OTHER:
Maximum enrolment: **18**
Expected frequency of course offerings: annually
(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☒ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s): **Jim Wiese**

Department Head:	**Awneet Sivia**	Date approved:	**March 2011**
Campus-Wide Consultation (CWC)		Date of meeting:	**March 21, 2011**
Curriculum Committee chair:	**Awneet Sivia**	Date approved:	**April 15, 2011**
Dean/Associate VP:	**Dr. Rosetta Khalideen**	Date approved:	**April 8, 2011**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**April 26, 2013**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

- Demonstrate familiarity with the B.C. Secondary Science IRPs that focus on students in grades 11- 12.
- Apply constructivist learning theory for designing learning activities in secondary science, with emphasis on the senior secondary grades (grades 11- 12).
- Apply the Secondary Science IRP (grades 11- 12) to develop and teach science activities in Biology, Earth Science, Geology, and Sustainable Resources in a community setting.
- Create a short sequence of lessons in science using inquiry and direct instruction.
- Identify safe practices in classroom, laboratory, and field settings. Demonstrate how those practices are a part of a secondary science classroom.
- Integrate the use of information technology in science lessons.
- Develop basic strategies for assessing understanding of content, skills, and problem solving in secondary science.
- Design assessment tools in relation to science curricula for diverse learners
- Demonstrate an understanding of the content and major concepts necessary for teaching biology, earth science, geology, and sustainable resources courses in a B.C. secondary school.

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

- The course will be presented using a variety of techniques: classroom lectures, laboratory experiments, activities, films, and demonstrations.
- Close coordination will be maintained between the theoretical and laboratory work and the standard practices in British Columbia's secondary classroom.
- Weekly assignments will be used to evaluate the rate of learning and depth of the students' knowledge and understanding.
- At least half of the classroom time will be spent on hands-on learning and laboratory activities.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☐ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☐ Other (specify):

☒ PLAR cannot be awarded for this course for the following reason(s): Methods courses within a teacher education program are integrated into the practicum and other course work within this professional program. Students are not permitted to audit, challenge courses.

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Texts:

Chiapetta & Koballa, (2010). *Science instruction in the middle and secondary schools: Developing fundamental knowledge and skills, 7/E,* Allyn & Bacon,

B.C. Curriculum Resources: available at <www.bced.gov.bc.ca/irp/irp.htm>

Biology 11 and 12 Integrated Resource Package. (2006). Victoria: Ministry of Education, Curriculum Development Branch, Province of British Columbia

Earth Science 11 and Geology 12 Integrated Resource Package. (2006). Victoria: Ministry of Education, Curriculum Development Branch, Province of British Columbia

Sustainable Resources 11 and 12 Integrated Resource Package. (2008). Victoria: Ministry of Education, Curriculum Development Branch, Province of British Columbia

Environmental Learning and Experience: An Interdisciplinary Guide and video clips for Teachers (2007). Victoria: Ministry of Education, Curriculum Development Branch, Province of British Columbia

Science Safety Resource Manual. (2003). Victoria: Ministry of Education, Curriculum Development Branch, Province of British Columbia

SUPPLIES / MATERIALS:

Fully-equipped science lab with standard science equipment used to teach science in a B.C. secondary school.

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Reflections:	10%
Participation:	10%
Unit Planning:	35%
Short paper:	20%
Presentations:	25%

Grading for this course is on a credit, no credit basis. Students who achieve a level equivalent to a C+ or better will be assigned a CR (credit) grade. Students achieving below a C+ level will be assigned NC grade. It is expected that students will complete all assignments and revisions to assignments as required.

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

Major Concepts:

- How constructivist learning theory influences classroom practice
- The nature of science and learning in science
- Pupil's conceptions in science and implications for citizenship
- Inquiry teaching and strategies for science learning
- Direct instruction and strategies for science learning
- Information technology to promote science learning
- Basics of safety in the classroom, laboratory, and field
- The local community as a location for science and stewardship activities
- Lesson planning and unit planning specific to Biology and Earth Sciences
- Using a range of on-going assessment strategies for science activities
- Diversity and inclusion issues in science teaching
- B.C. Secondary Science curriculum IRPs for Biology and Earth Sciences and Science Safety Resource Manual (2003)
- Application of science into other subject areas, including social studies, mathematics, health, consumerism, community planning, etc.
- Resources available for science teaching (e.g., Project Wild, Streamkeepers, etc.)
- Basic information on the curriculum content organizers: Processes and Skills of Science, Biology, Geology, Sustainable Resources and Earth Science, as they relate to each course taught in a B.C. secondary school.

ASSIGNMENTS

- Reflections: Student responses to issues presented in class, ideas about science and science education, current topics in teaching mathematics, etc.
- Activities and Assignments: Classroom activities as necessary to develop student understanding of the issues and concepts in science and science education.
- Model Teaching: Collaborative planning, microteaching, and assessment of a science lesson (from the Learning portfolio).
- Learning portfolio: Student science teaching portfolio, consisting of a series of lessons within one of the curriculum areas in the IRP using direct instruction, cooperative learning, and peer tutoring (includes activities, assessment and reflection on teaching strategies and microteaching) [collaborative or solo]. They can also begin to collect materials and resources that will help them teach science in a secondary school setting. They should also include a critique of the appropriate use of direct instruction, inquiry, and cooperative learning in science teaching. One part of this portfolio synthesizes the student's growing understanding of secondary science teaching and secondary teaching strategies and how their teaching practice is related to the key values of UFV's teacher education program. This assignment may be used to contribute to the Education 495 portfolio project..