OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE: May 2013
COURSE REVISED IMPLEMENTATION DATE:
COURSE TO BE REVIEWED: May 2019
(six years after UPAC 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 435	Faculty of Professional Studies, Education	3
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Designs for Learning Secondary Mathematics
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course provides an introduction to fundamental pedagogical concepts and skills necessary for the effective teaching of secondary mathematics. The B.C. provincial curriculum Integrated Resource Package (IRP) and current curriculum frameworks will be used as a focus for exploring diverse pedagogical strategies. The course will highlight the theory and practice of cooperative learning in a mathematics setting. The course will also introduce students to a range of mathematical activities that develop mathematical reasoning, concepts, and skills across the secondary grades. Integration of mathematics with other subject areas will be addressed.

PREREQUISITES: Admission to the Teacher Education Program (TEP)
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: 45
STRUCTURE OF HOURS:

Lectures:	23	Hrs
Seminar:	22	Hrs
Laboratory:		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. IRPs for various mathematics courses taught at the secondary level.
- Apply constructivist learning theory for designing learning activities in secondary mathematics.
- Demonstrate the use of a variety of manipulatives and integration with curriculum activities (e.g. in science, social studies) to develop pupils' mathematical understanding.
- Apply critical thinking activities to address higher level mathematical content
- Design a short sequence of lessons in mathematics, including activities that use cooperative learning techniques and other techniques that foster a wide range of learning styles.
- Develop basic strategies for using on-going assessment for pupils' understanding of content, skills, and problem solving, addressing a wide variety of student's learning needs.
- Integrate the use of information technology in the learning of mathematics.

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 practical work and the standard practices in British Columbia's secondary classroom.
- Weekly reflections 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 inquiry based 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:
Alfred Posamentier, Beverly Smith, Jay Stepelman. (2010). *Teaching secondary mathematics: Teaching and enrichment units.* Boston: Allyn & Bacon.

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

Apprenticeship and Workplace Mathematics 10
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_app_work10.pdf

Apprenticeship and Workplace Mathematics 11
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_app_work11.pdf

Apprenticeship and Workplace Mathematics 12
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_app_work12.pdf

Foundations of Mathematics and Pre-Calculus 10
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_foundations_precalc10.pdf

Foundations of Mathematics 11
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_foundations11.pdf

Foundations of Mathematics 12
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_foundations12.pdf

Pre-Calculus 11
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_precalc11.pdf

Pre-Calculus 12
http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_precalc12.pdf

Textbooks, References, Materials continued:

Common Curriculum Framework Mathematics 10 to 12 Integrated Resource Package (2010 – 2012). B.C. Ministry of Education. Available at www.bced.gov.bc.ca/irp/irp.htm.

Recommended Reading:
Teaching for Effective Learning: The Complete Book of PEEL Teaching Procedures. (2004). Peel Publishing Group: Melbourne, Aus.

SUPPLIES / MATERIALS:

Fully-equipped classroom with standard mathematics manipulatives and other materials used to teach mathematics 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:

TOPICS

- How constructivist learning theory influences classroom practice
- The nature of mathematics and learning in mathematics
- Pupil's conceptions in math and implications for teaching and learning
- Numeracy initiatives in B.C.
- Use of manipulatives, activities, and strategies to promote mathematical reasoning, understanding, and problem solving
- Cooperative learning
- Introduction to use of computers and calculators in the mathematics classroom
- Application of mathematics into other subject areas, such as science and social studies, to show its relevancy
- Lesson planning and unit planning
- B.C. Secondary Mathematics Curriculum for various courses taught in the standard secondary school
- Using a range of on-going assessment strategies for mathematics activities
- Diversity and inclusion issues in mathematics teaching
- Resources available for mathematics teaching
- Basic information on the content organizers: Numbers, Statistics and Probability (Data Analysis and Chance and Uncertainty), Patters and Relationships (Patterns and Variable and Equations), Shape and Space (Measurement, 3-D objects and 2-D shapes, and Transformations), Algebra and Number, Relations and Functions, Geometry, Trigonometry, etc., as they relate to each course taught in a B.C. secondary school.

ASSIGNMENTS

- Reflections: Student responses to issues presented in class, ideas about mathematics and mathematics education, current topics in teaching mathematics, etc.
- Activities and Assignments: Classroom activities as necessary to develop student understanding of the issues and concepts in mathematics and mathematics education.
- Model Teaching: Collaborative planning, microteaching, and assessment of a mathematics lesson (from the Learning portfolio).
- Learning portfolio: Student mathematics 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 mathematics in a secondary school setting. They should also include a critique of the appropriate use of direct instruction and cooperative learning in mathematics teaching. One part of this portfolio synthesizes the student's growing understanding of secondary mathematics 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.