Faculty of Education
The University of Western Ontario

B.Ed Course Outline

Curriculum and Pedagogy in Intermediate/Senior General Science #5223
Mondays & Wednesdays, Room 2051

Instructor: Peder Nielsen

Course Coordinator: Dr. Margaret McNay

Calendar Copy:

An introduction to theoretical perspectives on the nature of science and science education, and to curriculum and pedagogy. Topics include constructivist, cognitive, behavioural, and social theories of science learning, and examination of teaching strategies and relevant resources.
Two hours per week, 1.0 credit

Course Description:

This course is provided for IS Teacher Candidates in General Science. The course explores a number of topics, materials and teaching strategies which will extend candidates’ knowledge and skills for the teaching of science. Three major areas of focus are addressed:

- Theoretical perspectives in science teaching.
- Constructivist, cognitive, behavioural and social theories of science learning.
- An introduction to curriculum and pedagogy in science which includes examination of the Ontario secondary science curricula.
Learning Outcomes:

On completion of this course, teacher candidates will:

- demonstrate their growing understanding of the **Ontario College of Teachers’ Standards of Practice** (Professional Knowledge, Professional Practice, Leadership in Learning Communities and Ongoing Professional Learning) and **Ethical Standards** (Care, Respect, Trust, and Integrity) by conducting themselves as an educator both in the faculty and on placement.
- participate actively in classroom management scenarios to become familiar with the expectations of student behaviour and appropriate student engagement in classroom participation as modelled by the instructor.
- be advised of the expectations when on their practicum (ex: appropriate attire, behaviour, teacher-student role, teaching students).
- successfully apply the Ontario Ministry of Education Course guidelines (IS) General Science courses and the Growing Success document to create lesson plans and construct a unit guide for a specific strand as an assignment.
- utilize a variety of teaching strategies (e.g. differentiated instruction, inquiry-based learning, PEOE, graphical organizers, think-pair-share, jigsaw, placemat) in lesson planning.
- incorporate technologies where appropriate in their lesson planning and presentation to their colleagues such as: overhead projector, SMART Board, electronic presentation, document camera, smart phones, videos, apps on tablets, in demonstrations to their colleagues and in incorporating these in lesson planning.
- recognize and incorporate in both their assignments and teaching opportunities strategies such as the constructivist approach to science education, multiple-intelligence, learning styles, application and implication of technology in education both in terms of positive aspects (e.g. research) and issues of negative (e.g. safety, computer use contract).
- conduct presentations that offer teaching strategies and planning ideas to their peer group in a professional manner and engage positively as an audience member during the sessions led by colleagues.

Course Content:

- curriculum knowledge of science in the intermediate and senior grades
- theories of knowledge and learning (and their relationship to teaching practice)
- methods of engaging students in learning of science: lesson and unit planning
- methods of assessing student learning and evaluating student achievement
- learning science via inquiry
- role of technology in learning science
- role of critical self-reflection on professional practice
- scientific literacy and numeracy
- financial literacy
**Course Materials:**

Access to:

The Ontario Curriculum, Grades 9 and 10: Science, 2008 (revised)
http://www.edu.gov.on.ca/eng/curriculum/secondary/science.html

The Ontario Curriculum, Grades 11 and 12: Science, 2008 (revised)
http://www.edu.gov.on.ca/eng/curriculum/secondary/science.html

Growing Success
http://www.edu.gov.on.ca/eng/policyfunding/success.html

**Recommended Reference:**

Tips & Strategies for the Novice Science Teacher (STAO)
Stay Safe! (2002) (STAO)
Laboratory Recipes (2001) (STAO)

**Assignments and Other Course Requirements:**

- Learning Object 2016 Sep 28 10%
- Lesson Plan 2016 Oct 05 10%
- Unit Guide 2016 Oct 31* 20%
- Contribution 10%
- Instructional Video 2017 Feb 01 10%
- Science in the News 2017 Feb 08 05%
- Podcast 2017 Feb 15 05%
- TACK (KICA) 2017 Feb 27* 20%
- Contribution 10%

* Presentations start on this date
Policy Statements:

Accessibility: The University of Western Ontario is committed to recognizing the dignity and independence of all students and seeks to ensure that persons with disabilities have genuine, open and unhindered access to academic services. Please contact the course instructor if you require course materials in an alternative format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for information about requesting academic accommodation, or go to the following website: http://www.edu.uwo.ca/programs/preservice-education/documents/policies/Accessibility_Western.pdf

ATTENDANCE: The B.Ed. program is an intense and demanding program of professional preparation. You are expected to demonstrate high levels of both academic and professional integrity. Such integrity is demonstrated in part by your commitment to and attendance at all classes, workshops, tutorials, and practicum activities. Read more about the Faculty’s attendance policy on-line: http://www.edu.uwo.ca/programs/preservice-education/Attendance%20Policy%202016.pdf

EXCUSED ABSENCES: If you are ill, require compassionate leave, or must miss classes for religious observance, your absence is excused; you will not be penalized but you are responsible for work missed.

UNEXCUSED ABSENCES: Any absence that is not a result of illness, bereavement, or religious observance is an unexcused absence. Three unexcused absences will result in you being referred to the Associate Dean and placed on academic probation. Any further unexcused absence will result in failure of the course and withdrawal from the program.

Language Proficiency: In accordance with regulations established by the Senate of the University, you must demonstrate the ability to write clearly and correctly. Work which lacks proficiency in the language of instruction is unacceptable for academic credit, and will either be failed or, at the discretion of the instructor, returned to you for revision to an acceptable level.

Late Penalties: Normally, the only acceptable reasons for late or missed assignments are illness (which you must report to the Teacher Education Office) or extreme compassionate circumstances. Unexcused late assignments will be penalized at a rate of 5% per day day, and will not be accepted more than 7 days after the due date unless prior arrangements have been made with the instructor.

Academic Offences: Scholastic offences are taken very seriously in this professional Faculty. You are, after all, going to be a teacher. Read about what constitutes a Scholastic Offence at the following Web site: http://www.edu.uwo.ca/programs/preservice-education/documents/policies/WEB_ScholasticDiscipline.pdf

Plagiarism: Plagiarism means presenting someone else’s words or ideas as your own. The concept applies to all assignments, including lesson and unit plans, laboratory reports, diagrams, and computer projects. For further information, consult your instructors, the Associate Dean’s Office, and current style manuals. Advice about plagiarism and how to avoid it can also be found here: http://www.edu.uwo.ca/programs/preservice-education/documents/policies/WEB_PlagiarismPolicy.pdf

Plagiarism-Checking:

a. All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com) [j10] and [j11]
b. Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

**Use of Laptops & Notebooks in Class:** As a courtesy to members of the class, please put your cell phone on ‘vibrate’ or turn it off during class. Laptops and other electronic devices may be used in a professional manner to facilitate your activities in the course, but out of courtesy to colleagues and the instructor, please do not engage in personal networking and non-course communication during class time – save it for before or after class, or for the break.

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**SUPPORT SERVICES**

A variety of support services are available at Western. If you need advice or assistance, do not hesitate to get in touch with any of these services.

**FINANCIAL ASSISTANCE:** Registrarial Services (http://www.registrar.uwo.ca)

**WRITING SUPPORT:** Student Development Centre (http://www.sdc.uwo.ca/)

**LEARNING SKILLS SUPPORT:** Student Development Centre (http://www.sdc.uwo.ca/)

**INTERNATIONAL STUDENTS:** Student Development Centre (http://www.sdc.uwo.ca/)

**ABORIGINAL STUDENTS:** Student Development Centre (http://www.sdc.uwo.ca/)

**STUDENTS with DISABILITIES:** Student Development Centre (http://www.sdc.uwo.ca/)

**SOCIAL & CULTURAL ISSUES:** University Students’ Council (http://westernusc.ca/services/).

**EMOTIONAL or MENTAL DISTRESS:** Students who are in emotional or mental distress should refer to Mental Health @ Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

**B.Ed./Dip.Ed. PROGRAM ISSUES:** zuber@uwo.ca, Teacher Education Office, room 1166

**NEED HELP but not sure what to do:** zuber@uwo.ca, Teacher Education Office, room 1166
References:


Students should also become familiar with the current Education Library holdings which are relevant to teaching science (e.g. journals such as *Crucible, Science and Children, Science Scope and The Science Teacher*) as well as books about teaching science and the available intermediate science textbooks used in