APPROVED

RECEIVED
APR 10 2012
COLLEGE OF GRADUATE STUDIES

The University Of Toledo

New Graduate Course Proposal

* denotes required fields

1. College*: J Herb Edu, Hlt Sci, Human Ser

   Department*: Curriculum and Instruction

2. Contact Person*: Rebecca Schi Phone: 530-2504 (xxx-xxxx) Email: Rebecca.Schi Please input the correct Contact Person. Please input phone number in this format: xxx-xxxx. Please input the correct Email Address.

3. Alpha/Numeric Code (Subject area - number)*: CI - 6140 Please input 2-4 characters for Item 3 Subject Area. Please input the 4-digit numeric code for Item 3.

4. Proposed title*: Science meth Charactor not allowed.

   Proposed effective term*: 201240 (e.g. 201140 for 2011 Fall) Please input the 6-digit numeric code for term.

5. Is the course cross-listed with another academic unit? ○ Yes ◉ No

   Approval of other academic unit (signature and title)

   Is the course offered at more than one level? ○ Yes ◉ No

   If yes, an undergraduate course proposal form must also be submitted. If the undergraduate course is new, complete the New Undergraduate Course Proposal; if the undergraduate course is existing, submit an Undergraduate Course Modification Proposal.

6. Credit hours*: Fixed: 3 or Variable: to Please Enter Only Numbers for Fixed Credit Hours Please Enter Only Numbers for variable Credit Hours From Please Enter Only Numbers for variable Credit Hours To

7. Delivery Mode:

	Primary*	Secondary	Tertiary
a. Activity Type *	Recitation	--SelectType--	--SelectType--
b. Minimum Credit Hours *	3 Please Enter Only Numbers	Please Enter Only Numbers	Please Enter Only Numbers
Maximum Credit Hours *	3 Please Enter Only Numbers	Please Enter Only Numbers	Please Enter Only Numbers

c. Weekly Contact Hours * 2,5

8. Terms offered: ☑ Fall ☐ Spring ☐ Summer

Years offered: ◉ Every Year ○ Alternate Years

9. Are students permitted to register for more than one section during a term? ◉ No ○ Yes

May the courses be repeated for credit? ◉ No ○ Yes Maximum Hours

10. Grading System*:

◉ Normal Grading (A-F, PS/NC, PR, I)

○ Passing Grade/No Credit (A-C, NC)

○ Credit/No Credit

○ Grade Only (A-F, PR, I)

○ Audit Only

○ No Grade

11. Prerequisites (must be taken **before**): i.e. C or higher in (BIOE 4500 or BIOE 5500) and C or higher in MATH 4200

admission to SECE or MIDD LAMP program required

100 Max.

○ PIN (Permisson From Instructor) ◉ PDP (Permission From Department)

Co-requisites (must be taken **together**):

CI 6240 Science practicum

100 Max.

12. Catalog Description* (**75 words Maximum**)

An initial in-depth study of methods and materials for teaching Science in middle and secondary classrooms with emphasis on planning, content standards and instruction strategies; for LAMP Middle Childhood and AYA licensure only. Co-requisite: CI 6240

13. Attach a syllabus and an electronic copy of a complete outline of the major topics covered. Click here for template.

Syllabus: * File type not allowed.

Additional Attachment 1: File type not allowed.

Additional Attachment 2: File type not allowed.

Course Approval:

Department Curriculum Authority:	Rebecca Schneider	Date 3-16-12
Department Chairperson:	Leigh Chiarelott	Date 3/16/12
College Curriculum Authority or Chair:	Rebecca Schneider	Date 4-9-12
College Dean:	Barbara Kay	Date 4.9.12
Graduate Council:		Date 5-17-2012
Dean of Graduate Studies:		Date
Office of the Provost :		Date

Administrative Use Only

(YYYY/MM/DD)

CI 6140 Science methods of teaching
Course Syllabus

Instructor:
Email: Phone:
Office Hours: Office: 2000 Gillham Hall
Time/Location Course:
Webpage: http://alcot.utoledo.edu

Overview

Designed for individuals planning to teach middle or high school science, this course explores both the teacher's and the students' role in the secondary science classroom. As prospective teachers (candidates) we will focus on the role of the teacher, but always with reference to the ways in which teachers interact with students to create positive environments that foster inquiry and promote learning. We will touch on numerous aspects of science classrooms including: designing curriculum, planning lessons, determining and adapting appropriate teaching methods, promoting inquiry, fostering dialogue, meeting district and national standards, using technology to promote learning, and assessing students' learning. The classroom-based portion of the course will focus on learning about teaching through enactment and interactions with students.

Prerequisites: Admission to SECE or MIDD LAMP program

Corequisite: CI 6240 Science Practicum

Driving Question

The following question will be the focus of our work in this class: What can a teacher do to promote motivation and learning in science classrooms? In addressing this question, we will focus on two topics that concern us as teachers: teaching and learning.

Objectives

During the semester, emphasis will be placed on exploring appropriate teaching models that reflect the nature, method and content of your domain; the characteristics of students; and the nature of the instructional setting. The major course goal is to provide you with appropriate experiences for initial growth as a professional content educator and the knowledge and tools to develop further. As perspective teachers (candidates), you will become designers of instructional materials. You will utilize the principles of design in developing lessons, curriculum, and assessments.

In the classroom, emphasis will be placed on exploring first-hand the characteristics of students, and the nature of the instructional setting, and enactment of appropriate instructional plans. For teachers this means knowing how to learn from students and enactment to improve practice.

As the result of the course, you will gain experiences in the following.

1. Synthesizing a rationale for teaching content
2. Designing instruction, both daily and long term, for teaching the content and processes of your domain in a way that addresses local and national content standards and accounts for the nature of your content and the nature of the learner
3. Planning and modifying instruction based on context, recommended practices, and student learning to meet the needs of various student populations
4. Utilizing specific teaching methods that encourage inquiry and construction of understanding

5. Assessing students' ideas and learning
6. Reflecting on your instructional practices and student learning
7. Developing and presenting a professional manner and disposition

Activities and Evaluation
Your performance will be evaluated on the following:

Lesson plan design
Interns will design three lessons. The first will be a **demonstration** that will help middle or high school students learn a concept. The second lesson will be an **investigation** to guide students in exploring or investigating a concept. The third lesson will feature the use of a **learning technology tool**. Each lesson plan must include a **design rationale** that is based upon course content and which explicitly incorporates feedback or critique from a class partner or mentor. This design rationale must incorporate a description of elements that make this particular lesson an inquiry lesson. These lessons will be shared with the class and critiqued. You do not need to start from scratch but you must cite all of your sources for materials and ideas.

Cycle 1 revised: Science Task
Interns will develop a plan for science task for a small group or whole class for 2-3 days of instruction. Plans may be developed from your mentor teachers' plans and may focus on a specific science idea.

On campus: Final task plans will include student learning objectives, specific lesson plans, revisions as appropriate, and a design rationale.

Cycle 2 revised: Inquiry Science Unit
Interns will develop an inquiry science unit that covers approximately 15 class days. You do not need to start from scratch but you must cite all of your sources for materials and ideas. Unit plans will include student learning objectives, science concept map, annotated calendar, and specific lesson plans. One lesson will focus on **investigation**, another on engaging students with **phenomena**, and third on student use of **learning technologies**. In addition, one lesson must include a **performance-based assessment**. As part of the unit design, students will include a **design rationale** based upon course content and students' ideas based on enactment in your field experience.

On campus: Final unit plans will include student learning objectives, science concept map, annotated calendar, and specific lesson plans, revisions as appropriate, and a design rationale. You will share your revised unit with the class in a poster session.

Critical performances
As part of your licensure program at the University of Toledo you will be completing a series of *critical performances*. *Critical performances* are program-based assessments of your readiness to continue at each phase of the licensure program. During the methods and field experience semester you will be demonstrating readiness to student teach by completing 3 *critical performances*. These include: 1) videotaped lesson with commentary, 2) assessment of student learning, and 3) unit plan. Each critical performance must conform to all requirement described by The University of Toledo and must be completed satisfactorily before student teaching.

Assessment Scheme: Assignments are due on the dates noted below. **You must submit an assignment on time in order to participate in the revision option.** Grades will be lowered by one letter grade for each day an assignment is late unless prior arrangements are made with the professor. The requirements are subject to change and adaptation at the discretion of the professor. **Candidates must earn a grade of C or better on <u>each</u> assignment in order to earn a passing grade for the course.**

Assignments on campus	Percent of Grade	Due Date
Lesson 1: Revision (optional)	20	9/23 10/12
Lesson 2: Revision (optional)	20	10/7 10/26
Lesson 3: Technology Revision (optional)	10	11/4 11/16
Cycle 1: Domain Task – updated • Revised task	20	9-27
Cycle 2: Domain Unit – update* • Revised plan with assessment and rationale • Poster session	30	 12/2 12/2

*Critical performance

Required Materials (available at Student Union Bookstore)
Chiappetta, E.L. & Koballa, T. R. (2008). *Science instruction in the middle and secondary schools: Developing fundamental knowledge and skills* (7th ed.). Allyn & Bacon.

Koballa, T. R., & Tippins, D. J. (2003). *Cases in middle and secondary science education*. Prentice Hall.Upper Saddle River, NJ: Pearson.

AAAS. (1993). <u>Benchmarks for Science Literacy</u>. New York: Oxford University Press. On-line: <u>http://www.project2061.org/tools/benchol/bolframe.htm</u>

National Research Council (1996). <u>National Science Education Standards.</u> Washington, DC: National Academy Press. On-line: <u>http://www.nap.edu/readingroom/books/nses/</u>

Ohio Department of Education (2002). Science Academic Content Standards (K – 12). On-line: <u>http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=334&ContentID=834&Content=32645</u>

Recommended Materials (available at on-line)
National Science Teachers Association (NSTA): <u>http://www.nsta.org</u>

Resources (available at the library)
Krajcik, J. S. & Czerniak, C. M. (2008). *Teaching science in elementary and middle school classrooms: A project-based zpproach* (3rd ed.). New York, NY: Lawrence Erlbauml.

Professional Journals: *The Science Teacher, Science Scope, The Biology Teacher, Chemical Education,* or *The Physics Teacher.*