113 - UCCh. 39-GCCh. (sigs)

Submit originals (including syllabus) and one copy and electronic copy to the **Faculty Senate Office**See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/ for a complete description of the rules governing curriculum & course changes.

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL Attach a syllabus, except if dropping a course.

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Prepared by	Jann Laiti/Carol Barnhardt				t	Phone				6447/6457		
Email jmlaiti@alas			aska.edu			Faculty	Carol Barnhardt					
Contact	cabarnhardt@alaska.ed			.edu	Contact							
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	CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, se and credits ED F479 Science Methods and Curriculum Development							
	2 Credits Offered Spring							
	Study and application in the classroom of the best practices from research-based strategies for the teaching and learning of science concepts, content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of science unit. Classroom internship required. Prerequisites: Admission to internship year; concurrent enrollment in other internship year courses; Alaska passing scores for three Praxis I exams. Stacked with ED F688. (2+0)							
<i>7.</i>	COMPLETE CATALOG DESCRIPTION AS IT WILL APPEAR WITH THESE CHANGES: (Underline new wording strike through old wording and use complete catalog format including dept., number, title, credits and cross-listed and stacked.) PLEASE SUBMIT NEW COURSE SYLLABUS. For stacked courses the syllabus must clearly indicate differences in required work and evaluation to the last of the course of the syllabus.							
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8.	IS THIS COURSE CURRENTLY CROSS-LISTED? YES/NO No If Yes, DEPT NUMBER (Requires written notification of each department and dean involved. Attach a copy of written notification.)							

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JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

Teacher education programs are under a great deal of scrutiny to assure policy makers and the general public that future elementary teachers have sufficient content knowledge and skills in the areas in which they have teaching responsibilities <u>and</u> that they have clearly defined coursework to assure that they also have opportunities to acquire the methods needed to successfully teach and develop meaningful curriculum in multiple content areas.

UAF elementary teacher education interns (i.e., students in their senior year of the BA in Elementary Education degree and elementary post-baccalaureate students completing their year-long internship) currently DO have these opportunities and requirements but this has not been accurately reflected in the current distribution of credits during their internship year. As an artifact of the process of development of the original BAE degree, the number of hours that interns spend in their elementary classroom placements and in their university methods and curriculum development courses has never been accurately reflected in the course credit allocations.

It is important that we correct these inaccuracies now for the following reasons:

1. External agencies (political entities and accreditation groups) now want more specific evidence that elementary teacher education students have dedicated coursework and internship requirements to prepare them to teach Reading, Writing, Math, Science, PE/Health and the Arts. This evidence needs to be reflected more directly and more accurately on our program requirements than it has been. Some of the work currently completed by students as part of ED 468 (a 6 credit course currently co-taught by 4 instructors) is being distributed to other courses so that the content of the courses is more clearly evident to reviewers.

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ED 479/688 SCIENCE METHODS AND CURRICULUM DEVELOPMENT On-CAMPUS (2.5+0.0+0.5)

This is a course that has both lecture (i.e., university course time) and internship (i.e., elementary classroom time) requirements. Specific times for university course meeting times and elementary classroom internship times are included on the year-long internship calendar that is distributed each August by the UAF Department of Elementary Teacher Education.

COURSE INFORMATION

Credits: 3

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Prerequisites: Participating in the Internship Year or Permission of Instructor

Location:

OUP Room 150

- Blackboard http://classes.uaf.edu

Meeting Time: Dates and times noted on the internship calendar and on the syllabus calendar

INSTRUCTOR INFORMATION

Instructor: Cindy Fabbri

Office: 714D Gruening Building Office Hours: By appointment Telephone: (907) 474-1558

Fax: (907) 474-5451

Email: cfabbri@alaska.edu

MATERIALS

Carin, Arthur A., et al. 2005. *Teaching Science as Inquiry, Eleventh Edition*. Pearson Education, Inc.: Upper Saddle River, NJ.

Campbell, Brian and Fulton, Lori. 2003. Science Notebooks: Writing About Inquiry. Heinemann: Portsmouth, NH

National Research Council. 1996. *National Science Education Standards*. National Academy Press: Washington, DC. [online] http://www.nap.edu/readingroom/books/nses/

Alaska State Board of Education & Early Development. 2005. *Standards: Content & Performance Standards for Alaska Students, Third Edition.* Alaska Department of Education & Early Development: Juneau, AK. [online] http://www.eed.state.ak.us/standards/

American Association for the Advancement of Science. 1993. *Benchmarks for Science Literacy*. Oxford University Press: New York, NY. [online] http://www.project2061.org/publications/bsl/online/bolintro.htm

Fairbanks North Star Borough School District Science Curriculum (Adopted March 3, 2009) [online] http://www.k12northstar.org/curriculum/curriculum-documents/science

Annenberg Media "Video-on-Demand" (VOD) Series www.learner.org

If applicable, science textbook for your students/grades

Household materials may be required for lab investigations

Additional readings and resources TBA

COURSE DESCRIPTION

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This course provides an opportunity for students to study and apply research-based strategies, considered to be best practice, for teaching and learning science. Students will focus on science content and methods appropriate for elementary classrooms with diverse populations. Students will develop and implement a science unit. Self-reflection will be emphasized in the course.

COURSE GOALS

"Effective science teaching is more than knowing science content and some teaching strategies. Skilled teachers of science have special understandings and abilities that integrate their knowledge of science content, curriculum, learning, teaching, and students. Such knowledge, called 'pedagogical content knowledge,' distinguishes science knowledge of teachers from that of scientists. It is one element that defines a professional teacher of science."

- National Science Education Standards, Chapter 4

The goal of this course is to prepare interns to be a professional teacher of science. Interns will study the various aspects of pedagogical content knowledge mentioned above. Students will become familiar with current research and recommendations for science education. Science standards and inquiry-based learning will be emphasized. Interns will have the opportunity to practice and reflect on their science learning experiences.

STUDENT LEARNING OUTCOMES

Through study, experience and reflection, students will:

- Understand methods for teaching and learning science through inquiry;
- Be familiar with National, State and local standards for content, performance & practice;
- Become adept using research-based methods/strategies for teaching and learning;

- Understand and use knowledge of learning, pedagogy and students to create appropriate, relevant learning opportunities for diverse groups of students;
- Create and use multiple assessment strategies in the context of teaching a science unit;
- Plan and implement a holistic science unit; and
- Reflect on science topics, personal ideas, future goals and experiences as a science educator.

INSTRUCTIONAL METHODS

In the spirit of inquiry, mentioned in Standard A of the NSES, it is expected that students will:

- Assess prior knowledge and perceptions about science and education:
- Ask questions;
- Research and investigate to find answers:
- Interpret what they have found;
- Apply what they have learned;
- Reflect on the experience;
- Share the new knowledge and understandings;
- Refine the ideas; and
- Work independently and collaboratively.

To facilitate individual and group learning opportunities, coursework will include, at least:

- Hands-on investigations;
- Designing, implementing and reflecting on a science unit;
- Critical reviews of literature:
- Case Studies;
- Reflections and critiques of work done by oneself and peers; and
- Group collaboration and discussion.

ASSIGNMENTS

ED 479: 1000 points possible

ED 688: 1200 points possible (complete all ED 479 requirements + independent project)*

Audio-conference/Blackboard Attendance, Preparedness and Participation

Total Points Possible = $140 (20 \text{ points per class } \times 7 \text{ classes})$

Student attendance in class and on Blackboard is expected. With only seven classes it is essential that you make each and every class. Being prepared and participating are key elements of the learning experience. Being prepared and participating means being prepared to discuss homework assignments. Critical thinking and sharing of ideas that advance the group's learning are expected.

Show & Tell: Bring Science Resources to Class

Total Points Possible = $60 (20 \text{ points each } \times 3 \text{ resources})$

Bring three <u>science resources</u> to class to share with your colleagues. The resource (book, website, curricula, etc.) should be something not likely to be known by all of your colleagues. You will explain a bit about the resource, <u>why it is of high quality</u> and how to find it. At least one of your resources during the semester should be technology based.

Facilitate an In-class Presentation/Lesson

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Points Possible = 100 Points (Rubric will be provided)

You will choose a lesson from the appendix of your textbook, a FNSBSD science kit, or other pre-approved resource and will teach the lesson in class. You will teach the lesson to your peers as if they were your students. Ideally, you should teach a subject/discipline (i.e. physical science, life science, earth/space science) that is different from your take home lesson and unit. Your grade will be based on peer-assessments and instructor discretion.

Develop and Teach a Science Unit

Total Points Possible = 400 (Checklist and rubric will be provided)

Draft Unit = 100 Points

The draft is graded for completeness (cover sheet, week-long overview, 5 lesson plans, summative assessment rubric, and student activity sheets) and that it is turned in on time.

Please Note: Your mentor teacher and the course instructor must approve the unit plans before you teach the unit. Please plan accordingly.

Final Unit = 300 Points

<u>The final unit is graded for completeness</u> (cover sheet, week-long overview, 5 lesson plans, assessment rubric, and student activity sheets), <u>content/competencies</u> (see science unit rubric) and implementation.

Please note: You are encouraged to photograph and/or video tape your unit. Please let your UAF supervisor/liaison know when you are teaching this week.

Science Take Home Lesson & Written Reflection

Total Points Possible = 100 (Rubric will be provided)

Teach an inquiry-based lesson to an individual child or a small group of children. Assess your experience and write a thoughtful reflection about it. Ideally, you should teach a subject/discipline (i.e. physical science, life science, earth/space science) that is different from your in-class presentation and unit.

Science Teaching: Final Reflections, Summative Assessment and Future Plans

Total Points Possible = 200 (Guidelines will be provided)

This assignment will include five daily reflections and one comprehensive reflection on teaching your science unit. In addition, students will reflect on their new understandings of science education and their future professional development goals.

* ED 688 Students: Independent Project

Total Points Possible = 200

Students will be responsible for an independent learning project. Possible activities might include designing and implementing a unique lesson with students, watching a professional development series, reading a recommended book, working with students and teachers to develop science fair projects (outside of your regular class) or other significant, approved project. Please discuss this assignment with the instructor and get approval before you begin.

EVALUATION

As outlined in the UAF catalog, the grading system is as follows:

- An honor grade, indicates originality and independent work, a thorough mastery of the subject and the satisfactory completion of more work than is regularly required.
- B Indicates outstanding ability above the average level of performance (80% or better
- C Indicates a satisfactory or average level of performance. (70% or better)
- D The lowest passing grade, indicates work of below-average quality and performance. (60% or better)
- F Indicates failure. (Below 60%)

Grades will be posted using the following scale:

A	90-100%
В	80-89%
C	70-79%
D	60-69%
F	59% or below

As one of the culminating courses of the internship year, students are required to earn a "C" or better in order to successfully complete the licensure program. In addition to obtaining minimum grade requirements, students must meet all required ESAAP competencies in order to pass the class and continue with the internship. Any student in jeopardy of failing competencies or the class should contact the instructor as soon as possible to discuss an improvement plan.

CALENDAR

Please note, that this is a tentative schedule and it may be modified. Homework assignments listed for each class are your major assignments and you should be prepared to discuss them during class. Additional readings/work will be announced in class each week. Additional readings will be handed out in class or posted on the Blackboard site.

TBD 9:00-12:00

In class:

- What do I know about science education now? (Diagnostic Assessment)
- Course business... syllabus, etc.
- What do I teach? (NSTA Standards 1-4)
- How do I plan a science unit?
- What does a science unit look like?
- How do I write learning goals and objectives?

Homework:

- Read Text Chapter 1 (pages 12-26)
- Read Text Chapters 2, 4 and 7
- Use <u>Unit Template</u> and <u>Unit Planning Worksheets 1 & 2</u> to create a template for your unit, begin drafting unit learning goals and objectives and identify relevant standards
- ED 688 students determine what you would like to do for your independent project and talk to the instructor about it
- If applicable, prepare for in-class presentation and/or bring a resource to class

TBD 9:00-12:00

In class:

How do I teach science? (NSTA Standards 5 and 8)

Homework:

- Read Text Chapters 5 and 6
- Read Science Notebooks Chapters 1-3
- Use <u>Unit Template</u> and <u>Unit Planning Worksheets 2</u> to begin drafting lesson procedures and assessments
- If applicable, prepare for in-class presentation and/or bring a resource to class

TBD 9:00-12:00

In class:

• How do I teach science? (NSTA Standards 5 and 8)

Homework:

Read Text Chapters 3 and 10

- Use <u>Unit Template</u> and <u>Unit Planning Worksheets 2</u> to finish drafting lesson procedures and assessments
- If applicable, prepare for in-class presentation and/or bring a resource to class

TBD 9:00-12:00

In class:

- How do students learn? (NSTA Standard 5)
- What is appropriate and differentiated instruction?
- What is relevant and responsive curriculum? (NSTA Standard 7)

Homework:

- Use <u>Unit Template</u> and <u>Unit Planning Worksheets 3</u> to draft differentiation sections of lesson plans
- Finish the draft of your science unit. Bring two copies to class, one for peer review in class and one to submit to the instructor
- Make preliminary plans to teach a lesson from the back of the textbook during the week of Feb 14-18.
- If applicable, prepare for in-class presentation and/or bring a resource to class

TBD 9:00-12:00

In class:

• DRAFT Unit due

Homework:

- Read Text Chapters 8 and 9
- Read evolution readings (handed-out in class)
- Read Habits of Mind for the Science Laboratory
- Complete Take Home Lesson week of Feb 14-18 and write reflection. Reflection is due February 25th.
- If applicable, prepare for in-class presentation and/or bring a resource to class

TBD 9-12

In class:

- What do I need to know about science and technology? (NSTA Standard 5)
- What do I need to know about interdisciplinary learning?
- What do I need to know about teaching evolution? (NSTA Standard 1)
- What does an inquiry classroom look like? (NSTA Standards 3 & 9)
- What do I need to know about safety? (NSTA Standard 9)

Homework:

• Final Science Unit Due Before Teaching

TRD

Individual student appointments, if needed

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No class – Teach science unit (NSTA Standard 6)

Homework:

- Final unit and semester reflections are due April 8th
- ED 688 Independent Projects due April 8th
- If applicable, bring a resource to class

TBD 9:00-12:00

In class:

- What do I know about science education now? (Summative Assessment)
- What professional development opportunities exist? (NSTA Standard 10)
- Final Reflections Due
- ED 688 Independent Projects Due

POLICIES

As a compressed course, a great deal of information is covered each session. For this reason, attendance at all classes is expected. If an emergency situation arises and you will be missing class, please contact me before our scheduled class and we will make arrangements for you to make-up the missed work. Please let me know, if at anytime, you are having difficulties with the coursework or workload.

Students are loaned a science kit for the length of the semester from School of Education. These kits must be returned <u>in full</u> to receive a grade. Students not returning their kit will receive an "Incomplete" for a grade. An "Incomplete" grade will be posted for one year and then the grade turns to an "F".

In addition, students are expected to adhere to the Student Code of Conduct (Board of Regents' Policy 09.02.01). Students are required to conduct themselves honestly and responsibly, and to

respect the rights of others. Academic integrity is essential and expected from all students. Cheating or plagiarism is not acceptable.

SUPPORT SERVICES

If you have questions, concerns, comments, or individual needs please contact me immediately. In addition, please be aware that these other forms of assistance are also available:

Kelly Mendez
Coordinator – Elementary
474-7981
ksmendez@alaska.edu

Hillary Weller
Coordinator – Elementary
474-7981
hhweller@alaska.edu

Student Support Services (SSS)

Tel: (907) 474-6844 Email: sssp@uaf.edu

Tutoring Services:

Writing Center (907) 474-5314 Math Laboratory (907) 474-7332

DISABILITIES SERVICES

If you have a special need please notify the Office of Disability Services (474-7043) and me. I will make every effort to provide reasonable accommodations for you.