INDIANA UNIVERSITY-PURDUE UNIVERSITY FORT WAYNE
SCHOOL OF EDUCATION

EDUC E328 SCIENCE IN THE ELEMENTARY SCHOOLS

COURSE SYLLABUS
Spring 2003
EDUC E328 Meeting 9 – 11:50 a.m. on TWR
E328-01 meets in ET 111 on R; E328-02 meets in KT 148 on T; E328-03 meets in ET 146 on W

COURSE TITLE AND DESCRIPTION: EDUC E328 Science in the Elementary Schools (Cr. 3)

"Objectives, philosophy, selection, and organization of science materials and methods. Concept development and the use of multidimensional materials in science experiments. Analysis of assessment techniques and bibliographical materials. Public school participation required" (p. 192, IPFW Undergraduate Program Bulletin)

INSTRUCTOR INFORMATION

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THE MISSION OF THE IPFW SCHOOL OF EDUCATION
ADOPTED JANUARY 10, 1996

"To prepare professionals in teaching, counseling and leadership who demonstrate the capacity and willingness to continuously improve schools and related entities so that they become more effective with their clients by:

1 – Becoming more caring, humane, and functional citizens in a global, multicultural, democratic society;

2 – Improving the human condition by creating positive learning environments;

3 – Becoming change agents by demonstrating reflective professional practice;

4 – Solving client problems through clear, creative analyses;

5 – Assessing client performance, creating and executing effective teaching, counseling and educational leadership, by utilizing a variety of methodologies reflecting current related research;

6 – Utilizing interdisciplinary scholarship, demonstrating technological, and critical literacies, and effectively communicating with all stakeholders.

IPFW SCHOOL OF EDUCATION CONCEPTUAL FRAMEWORK: A LEARNING AND LEADERSHIP MODEL

We in the school of education are committed to the following conceptual framework for our programs:

1. **Democracy & Community**
   Effective educators[1], such as teachers, counselors, and administrators need to be a part of a dynamic educational community as a model for the climate of community they hope to create. To do this, these educators need an understanding of the moral, cultural, social, political, and economic foundations of our society. **Consequently, the SOE should foster a democratic, just, inclusive learning community among its students, faculty, and staff, and with all other stakeholders in the educational enterprise.**

2. **Habits of Mind**
   Effective educators realize that knowledge alone is not sufficient. They practice critical reflection in all endeavors. Within the context of a compassionate, caring community, educators foster habits of mind necessary to engage learners, such as investigating, inquiring, challenging, critiquing, questioning, and

evaluating. **Consequently, the SOE must integrate critical habits of mind in all aspects of the teaching/learning process.**

3. **Pedagogy**

   Effective educators need to understand multiple approaches to pedagogy as well as the multiple roles of the teacher, such as facilitator, guide, role model, scholar, and motivator. Educators appreciate and are receptive to the diverse perspectives, modes of understanding, and social circumstances that they and their students bring to the educational setting. **Consequently, the SOE needs to prepare educators to understand and use pedagogy creatively and thereby ensure active learning, conceptual understanding, and meaningful growth.**

4. **Knowledge**

   Effective educators need to be well-grounded in the content which they expect to teach. Educators need to understand how knowledge is constructed, how the processes of inquiry are applied, how domains of knowledge are established, how disciplines can be integrated and most effectively communicated to their students. Educators also need understanding of themselves, of communities in which they intend to teach, and of students. **Consequently, the SOE should immerse educators in nurturing learning communities that deepen knowledge, and encourage on-going intellectual, emotional, and personal growth.**

5. **Experience**

   Effective educators learn their craft through experiences in actual educational settings. Through on-site campus activities and field-based experiences students will observe and emulate exemplary teaching and learning. These educators will practice, collaborate, and interact with practitioners and their students. **Consequently, the SOE must integrate field and /or clinical experiences that reflect the diversity of educators, students, and schools into all aspects of the curriculum, and help educators to assess and reflect on those experiences.**

6. **Leadership**

   Effective educators are leaders. They have developed educational and social visions informed by historical and cultural perspectives. They strive to set the highest goals for themselves and inspire students to do likewise. Educators are enriched by the convergence of knowledge, theory, and practice as they optimistically face the educational challenges of the twenty-first century. **Consequently, the SOE must provide opportunities for educators to develop as leaders in their profession and in their communities.**

[1] *Educator* is broadly defined as pre-service and in-service teachers, administrators, and counselors.

GENERAL OVERVIEW OF THE COURSE

E328 explores the materials and methods employed in an elementary school science program. The major topics of the course cover learning methods of integrating science across the elementary curriculum; assessing and reflecting on science teaching and learning; using technology effectively; planning and facilitating a supportive science classroom; and planning integrated thematic inquiry units appropriate for elementary students.

CROSS-INDEXING COURSE OBJECTIVES TO INTASC AND IPSB

As the state of Indiana moves to alter its certification/licensing requirements to more adequately reflect national standards, course objectives and activities are expected to reflect these changes. This syllabus reflects two such sources. They are: (1) The Interstate New Teacher Assessment and Support Consortium (INTASC) Model Standards for Beginning Teacher Licensing and Development (1992) published by the Council of Chief State School Officers, and (2) Indiana Professional Standards Board (IPSB) Standards for Teachers of Science (1997).

INTASC Standards

The teacher understands…

1. The central concepts, tools of inquiry and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of the subject matter meaningful for students.

2. How children learn and develop, and can provide learning opportunities that support their intellectual, social, and personal development.
3. How students differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners.
4. A variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
5. Individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
6. Knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
7. Planning instruction based upon the knowledge of subject matter, students, the community, and curriculum goals.
8. How to use formal and informal assessment strategies to evaluate the effects and ensure the continuous intellectual, social and physical development of the learner.
9. How to be a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.
10. The knowledge to foster relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well-being.

IPSB Standards

The teacher of science understands…

1. the central concepts, tools of inquiry, and the history and nature of science in order to create learning experiences that make these aspects of science meaningful for the student.
2. how students learn science and provides science learning opportunities that support their intellectual, social, and personal development.
3. how students differ in their approaches to learning science and creates instructional opportunities that are adapted to diverse learners.
4. using a variety of instructional strategies to encourage students' development of conceptual understanding, inquiry skills, and scientific habits of mind.
5. using individual and group motivation and behavior to create science learning environments that encourage positive social interaction and active engagement in learning.
6. using a variety of communication techniques to foster equity, inquiry, collaboration, and supportive interaction in the classroom.
7. planning meaningful science instruction based upon knowledge of science, students, the community, science curricula and curriculum goals.
8. using a variety of authentic and equitable assessment strategies to evaluate and ensure the continuous intellectual, social, and personal development of the learner.
9. how an effective practitioner continually evaluates the effects of his/her choices and actions on others, and actively pursues opportunities to grow professionally.
10. that, in order to support student learning and well-being, the teacher of science fosters relationships with students and their families, colleagues, and concerned others.

E328 COURSE OBJECTIVES

The INTASC, National Science Education Standards (http://www.nap.edu/readingroom/books/nses/html/), American Association for the Advancement of Science (AAAS) Benchmarks (http://www.project2061.org/tools/benchol/bolframe.html) and the Indiana Academic Standards 2000 for Science (http://www.doe.state.in.us/standards/standards2000_science.html) will be emphasized throughout class meetings, assignments, and field experiences. The IPSB and INTASC standards are specifically cross-referenced below. This course is designed to assist you in reaching the following objectives:

1. * Read about and experience activities that will cause you to reflect on your beliefs about teaching, learning, and science. (INTASC & IPSB 1-10)
2. * Demonstrate growth in reflective practices. (INTASC & IPSB 1-10)
3. * Learn to plan and implement thematic inquiry and problem-solving lessons which integrate science, math, social studies, other disciplines, and technology across the elementary curriculum. (INTASC& IPSB 1-10)
4. * Learn to evaluate your growth in planning and conducting scientific inquiry with children. (INTASC & IPSB 8, 9)

5. * Learn to assess the growth of elementary school pupils within the integrated science/math/social studies curriculum. (INTASC & IPSB 6-9)
6. * Develop a positive attitude toward children and school personnel. (INTASC & IPSB 2-10)
7. * Learn to function within the elementary school classroom. (INTASC & IPSB 1-9)

*These objectives deal with multiculturalism, global perspectives, and diversity.

TEXTBOOK AND RESOURCES

Required For All Students (Available at Follet's IPFW Bookstore)

1. Krajcik, J., Czerniak, C, & Berger, C. (2003). *Teaching children science in Elementary and Middle School Classrooms: A project-based approach* (2nd ed). Boston, MA: McGraw-Hill College. (ISBN 0-07-248674-0)

2. Microsoft Office – This is present on the campus lab computers or may be purchased for just $5 at the bookstore with your schedule of classes and student ID.

Optional (Available at Follet's IPFW Bookstore)

1.) Bosak, S. V. (1991). *Science is…;A source book of fascinating facts, projects and activities*. Ontario, Canada: Scholastic Canada Ltd. (ISBN 0-590-74070-9)

2.) Delmar Publishers (1997). *The Best of WonderScience; Over 400 hands-on elementary science activities*. Albany, NY: International Thomson Publishing Inc. (ISBN 0-8273-8094-1)

3.) Liem, T. L. (1992). *Invitations to Science Inquiry (second edition); Over 400 discrepant events to interest and motivate your students in learning science*. Chino Hills, CA: Science Inquiry Enterprises. (ISBN 1-878106-21-X)

4.) Wadsworth Publishers (2001). *The Best of WonderScience Volume 2; Over 200 hands-on elementary science activities*. Belmont, CA: Wadsworth/Thompson Learning. (ISBN 0-537-59031-4 (Volume 2))

EXPECTATIONS OF ALL STUDENTS

Demonstrate a professional attitude by:
Attending all classes;
Actively participating in class discussions and activities;
Reading, reflecting upon, and completing activities;
Submitting quality work in a timely fashion;
Collaborating with and supporting peers;
Attending your T.E.A.M. internship school daily as scheduled.

Regular class attendance is required. Participation is expected. **More than TWO absences will result in the reduction of the final grade by one full letter grade (A ® B, B ® C, etc.). Leaving class early or arriving late counts as a partial absence.** If an absence is necessary, please notify the instructor in advance by phone call. This is a professional courtesy and in no way guarantees an absence will be excused. In any case it is the responsibility of the student to make up missed activities and hand in all assignments on time.

Egregious spelling, punctuation, and grammatical errors will result in the lowering of a paper's grade. A few minor errors will result in the grade be lowered by 5% of the total score (i.e., 85% to 80%). Numerous or significant errors will result in the grade being lowered by 10% of the total score (i.e., 85% to 75%). Please proofread your papers prior to their submission. Students who desire assistance in the preparation of their papers may contact the Writing Center (see information below). Please note that the Writing Center is not a proofreading service. Peer reviewers should fulfill this function.

Assigned papers must be typed with one-inch margins on all sides and in the 12-point size Arial font. The style for all papers is APA (American Psychological Association) unless otherwise noted or accepted by the instructor. **All work utilizing ideas from other sources must be fully referenced.**

THE IPFW WRITING CENTER

Improve your writing for any class through free individual conferences with experienced writing consultants in KT 234, The IPFW Writing Center – an excellent resource for all writers. Bring assignments, questions, ideas, and drafts. The staff will help you brainstorm, develop and logically organize your ideas; work on a style; and improve your documentation and editing skills.

Drop-ins are welcome, but to ensure help when you need it, sign for appointments on the bulletin board outside Kettler 234. Come early and come often to the Writing Center!

Hours: Sunday 1-5, Monday – Tuesday 10-5, Wednesday – Thursday 10-7, Friday 10-2.

When you can't get to campus, try Writing Online at: www.ipfw.edu/engl/welcome.htm

COURSE GRADING AND CRITERIA

The course grade is to be determined based on the following:

Percent	Assignments	Due Date
10%	Chapter Reading Summaries	**Randomly collected** by the instructor
10%	Webpage Creation in the Curriculum Lab	In class **Week 4**
15%	Science Central Deck Project	Posted on WebCT by **Friday of Week 5**
10%	Science Central Deck Reflection Paper	Email Attachment in WebCT Email by **Friday of Week 6**
10%	Science Fair Judging ***Reaction*** Paper	Bring to class **Week 9**
15%	FWCS Science Lesson Analysis Project	Posted on WebCT by **Friday of Week 10**
10%	Science Lesson Analysis Reflection Paper	Email Attachment via WebCT Email the **Friday of Week 11**
10%	Project Wild ***Reaction*** Paper	Bring to class **Week 15**
10%	Class Participation	

Your semester grade will be based on the following plan:

Grade*	Range
A	90 – 100 %
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	Below 60%

All assignments are to be turned in on time. Unless otherwise agreed upon by the instructor, the final score on assignments will be lowered by 10% for **each day** late.

***** *Regular class attendance is required.* Participation is expected. **More than TWO absences will result in the reduction of the final grade by one full letter grade (A ® B, B ® C, etc.). Leaving class early or arriving late counts as a partial absence.** If an absence is necessary, please notify the instructor in advance by phone call. This is a professional courtesy and in no way guarantees an absence will be excused. In any case it is the responsibility of the student to make up missed activities and hand in all assignments on time.

Bonus Percentage Points:
A total of up to 2 bonus percentage points may be earned by bringing proof (a ticket stub with a brief two paragraph description of how what you did related to this course) of having visited and examined the science displays at either the Toledo COSI, the Indianapolis Children's Museum, or another ***pre-approved*** event during this course.

******1 Point (of the 2 bonus percentage points) may also come from attending the **Project Learning Tree Workshop** on Saturday, March 1st from 8:00 – 12:00 in the Walb Union Blue Room (in basement). For this workshop you need to turn in a photocopy of your Project Learning Tree certificate to receive the bonus percentage point. Participants in the workshop receive *hundreds of activities to use in the classroom.* To schedule a reservation, please call Janet Jordan in the curriculum lab at 481-6459. Be certain to register early for this event!

1 Point (of the 2 bonus percentage points) may also come from attending the Hoosier Association of Science Teachers, Inc. (HASTI**) Annual Convention in Indianapolis, Indiana. This is an amazing event with hundreds of exhibits and presentations. I highly recommend attending on the **Friday of Week 6**. You must turn in a photocopy of your personalized registration ticket to receive the bonus percentage point. Go to www.hasti.org for details.

OPEN INVITATION

If at any time you consider yourself lost, overwhelmed, disgruntled, or just generally confused, please make an appointment and come and talk to me. If you drop by, I'll see you as my schedule allows. I'm here to assist you in learning to become the most competent teacher you wish to be. We all need help at some point, so don't delay if you find yourself in difficult circumstances.

POLICIES

The instructor will adhere to all IPFW policies pertaining to attendance, make-up tests, cheating/plagiarism as well as withdrawal, incompletes and the final exams. Students are expected to be familiar with these policies. Late assignments must be cleared with the instructor, preferable prior to the due dates unless the instructor agrees with the students that an unusual or emergency situation was present and the cause of the late assignment.

ACCESS

If you require disability-related accommodations in this class, if you have emergency medical information you wish to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. Please see me privately after class or at my office during scheduled office appointment hours.

The Services for Students with Disabilities department (SSD) is the campus office responsible for verifying that students have disability-related needs for academic accommodations and for planning appropriate accommodations, in cooperation with the students themselves and their instructors. Students who require academic accommodations should request authorization letters from SSD. The IPFW Services for Students with Disabilities office is located in Walb Student Union, Room 113 voice telephone/TTY (219) 481-6657.

ISSUES RELATED TO DIVERSITY AND MULTICULTURALISM

Issues related to pupil diversity will be addressed in this course. These concern concepts which deal with the cultural backgrounds of learners and concerns with the variation in contexts from which students come and in which schooling occurs.

The assumption applied in this course is that differences in contexts result in significant variations in how students, parents and educators view their world. Unless those who develop and implement curriculum understand and include these differences, schools are much more apt to be sterile places where large groups of students are failed rather than places where all children can be successful.

LOOK HERE TO FIND:

Metea Park: http://home.att.net/~Hamilton-Allen/metea/aboutmetea.html

Fort Wayne Children's Zoo: http://www.kidszoo.com/

The Foellinger-Freimann Botanical Conservatory: http://www.botanicalconservatory.org/

Fox Island: http://www.state.in.us/dnr/naturepr/npdirectory/preserves/foxisland.html

Science Central: http://www.sciencecentral.org/

HASTI Convention Information: http://www.hasti.org

Indianapolis Children's Museum: http://www.childrensmuseum.org/index.htm

Toledo COSI: http://www.cositoledo.org/

Science Fair Judging - sign-up sheets will be posted on my office door in Neff 240 A. You may also judge at another ***pre-approved*** Science Fair by first receiving instructor permission.

E328 SEMESTER SCHEDULE

Week…	Reading Summary Due	**E328 Schedule of Assignments**
1.) Tuesday, January 14 Wednesday, January 15 Thursday, January 16	Krajcik Chapter 1 & 2	1.) Introduce the course and learn WebCT 2.) Assign Chapter 1, 2 & 3 Reading Summaries due next week
2.) Tuesday, January 21 Wednesday, January 22 Thursday, January 23	Krajcik Chapter 3	1.) ****Meet at Science Central** to review the Deck Project 2.) Chapter 1, 2 & 3 Reading Summaries due and assign Chapter 4
3.) Tuesday, January 28 Wednesday, January 29 Thursday, January 30	Krajcik Chapter 4	**1.) **Meet at the Botanical Conservatory** 2.) Chapter 4 Reading Summary due and assign Chapter 5
4.) Tuesday, February 4 Wednesday, February 5 Thursday, February 6	Krajcik Chapter 5	1.) ****Meet in the IPFW Curriculum Lab** 2.) **Complete Webpage – Due today** 3.) Chapter 5 Reading Summary due and assign Chapter 6
5.) Tuesday, February 11 Wednesday, February 12 Thursday, February 13	Krajcik Chapter 6	**1.) **Meet at Science Central to complete Deck Project!!!** **2.) Post Decks with Deck Analyses as a single file under the Science Central Deck Project topic in the posting area of WebCT by Friday** 3.) Discuss Chapter 6 Reading Summary and assign Chapter 7 4.) Science Central Deck Reflection Paper due next week
6.) Tuesday, February 18 Wednesday, February 19 Thursday, February 20	Krajcik Chapter 7	1.) ****Meet at Fort Wayne Children's Zoo (*exact location yet to be determined in the Zoo*)** to begin Project Wild!!! 2.) Email as a MS Word attachment in WebCT your Science Central Deck Reflection Paper **by Friday**. 3.) *Start* **FWCS Science Lesson Analysis Project**
Week 7 & 8 - February 25th – March 6th		**Internship Week 1 &2**
*******March 10 – 14th IPFW Spring Break*******		
9.) Tuesday, March 18 Wednesday, March 19 Thursday, March 20	Krajcik Chapter 8	1.) ****Meet at the Fort Wayne Children's Zoo (*exact location yet to be determined in the Zoo*)** to continue Project Wild!!! 2.) Discuss Chapter 8 Reading Summary and assign Chapter 9 3.) **Bring** your **Science Fair Judging *Reaction* Paper**
10.) Tuesday, March 25 Wednesday, March 26 Thursday, March 27	Krajcik Chapter 9	1.) **Go to either Holland or Franke Park to teach your Science Lesson Plan – Post with Lesson Plan Analysis as a single file under the FWCS Science Lesson Analysis Project topic in the posting area of WebCT by Friday** 2.) Discuss Chapter 9 Reading Summary and assign Chapter 10 3.) Science Lesson Plan Analysis Reflection Paper due next week
11.) Tuesday, April 1 Wednesday, April 2 Thursday, April 3	Krajcik Chapter 10	**1.) **Meet at the Fort Wayne Children's Zoo (*exact location yet to be determined in the Zoo*)** to complete Project Wild!!! 2.) Email as a MS Word attachment in WebCT your Science Lesson Analysis Reflection Paper **by Friday**. 3.) Discuss Chapter 10 Reading Summary and assign Chapter 11 & 12 for Week 15 of class (after Internship)
Week 12 – 14 – April 8th – April 24th		**Internship Week 3, 4, & 5**
15.) Tuesday, April 29 Wednesday, April 30 Thursday, May 1	Krajcik Chapter 11 & 12	**1.) **Meet at Fox Island for the Writing Workshop!!!** 2.) Debrief Internship 3.) Discuss Chapter 11 & 12 Reading Summaries 4.) **Bring** your **Project Wild *Reaction* Paper** 5.) Schedule your T.E.A.M. II Portfolio Checkpoint
* Tuesday, May 6 * Wednesday, May 7 * Thursday, May 8	Portfolio Checkpoints	1.) Schedule a time to meet with your Internship Supervisor to examine your portfolio for the T.E.A.M. II Portfolio Checkpoint