

**Graduate Council  
Curriculum Committee  
February 27, 2003**

Present: Paul Frymier (Chair), Sherry Cable, Sam Morton, Naima Moustaid-Moussa, Brenda Rayman, Kay Reed, Gerald Schroedl, Richard Townsend. Representatives from the colleges present were Ed Caudill, Tom George, and Luther Wilhelm.

Dr. Paul Frymier called the meeting to order at 3:00 p.m.

1. Corrections to Curricular Proposals Approved by the Graduate Council January 30, 2003.

Additional corrections to the curriculum material that had been approved at the January 30, 2003 Graduate Council meeting were reviewed. The committee approved the corrections as reported.

2. Curricular Proposals.

- College of Arts and Sciences. A change of name for the Department of Geological Sciences to the Department of Earth and Planetary Sciences was included as information to the Graduate Council.
- College of Communication and Information. The committee approved changes in the names of a school, a subject area and a concentration involving renaming the Department of Broadcasting and combining it with the School of Journalism.
- College of Education, Health and Human Sciences. The committee approved the proposals for adding two courses in Sport Studies and offering a non-standard format course in Reading Education and an electronically-mediated format course in Science Education.
- College of Engineering. The committee approved retaining an Engineering Science course which had inadvertently been dropped earlier.
- College of Nursing. The committee approved adding Nursing 400 Aging and Society, which had earlier been approved by the Undergraduate Council. The committee sent a proposal for another Nursing course back to the college for additional information.

3. The committee asked that the Academic Policy Committee review policies related to concentration names being identical to major names. For example, in the material reviewed by the committee, the college of Education, Health and Human Sciences was requesting that the Sport Studies major have a concentration named Sport Studies.

The committee also asked that the Academic Policy Committee review guidelines for the number of hours of practicum per credit hour for graduate level courses.

The meeting adjourned at 4:05 p.m.

I. **CORRECTIONS TO CURRICULAR PROPOSALS APPROVED BY THE GRADUATE COUNCIL JANUARY 30, 2003**

**AND NATURAL RESOURCES**

**COLLEGE OF AGRICULTURAL SCIENCES**

**Page G50 (January 30, 2003 Graduate Council Minutes)**

**REVISE DESIGNATION**

**\*Environmental and Soil Sciences 507 (1) Professional Development Seminar** (formerly: Plant and Soil Sciences 507)

**Page G56 (January 30, 2003 Graduate Council Minutes)**

**REVISE DESIGNATION**

**\*PSLS 507 Professional Development Seminar (1)** (formerly: Ornamental Horticulture and Landscape Design 507)

- **\*These two courses are cross-listed. All the cross-listed courses should reflect the above changes:**

**Agriculture and Natural Resources 507 (primary)**  
**Animal Science 507**  
**Biosystems Engineering 507**  
**Biosystems Engineering Technology 507**  
**Environmental and Soil Sciences 507**  
**Food Science and Technology 507**  
**Plant Sciences and Landscape Systems 507**

**COLLEGE OF ENGINEERING**

**Page G238**

**INDUSTRIAL ENGINEERING**

Industrial Engineering revised the title of **IE 590** to: Multidisciplinary Project. There is a typo in the number of hours. The hours did not change. The corrected text should read:

- **REVISE TITLE**

**IE 509 Multidisciplinary Project (1)** (Formerly: Project Management). (Same as Mechanical Engineering 590.)

*This course is cross-listed with Mechanical Engineering 590. The revised title is indicated in the Dual M.S.-MBA Showcase – Mechanical Engineering (**Page G243**); however, a parallel proposal is needed to clarify this change:*

- **MECHANICAL, AEROSPACE AND BIOMEDICAL ENGINEERING**

**Mechanical Engineering**

**REVISE TITLE**

**ME 590 Multidisciplinary Project (1)** [Formerly: Project Management. Same as Industrial Engineering 590 (primary).]

Two courses were omitted in the Courses not Taught in Four or More Years List

**Page G248**

➤ **DROP THE FOLLOWING COURSES: NOT TAUGHT IN 4 OR MORE YEARS**

Audiology and Speech Pathology 532

Audiology and Speech Pathology 579

## II. CURRICULAR PROPOSALS

### COLLEGE OF ARTS AND SCIENCES

Informational Item: Name Change

FROM: Department of Geological Sciences

TO: Department of Earth and Planetary Sciences

**Effective: July 2003**

**From:** Don Richard Cox <dcox@utk.edu>  
**To:** Brenda Rayman <brayman@utk.edu>, <cely@utk.edu>  
**Date:** Mon, Feb 17, 2003 9:22 AM  
**Subject:** Departmental Name Change

Brenda,

I want to inform you of something that is in the works, has been in the works for over a year, and needs to be included somehow in the minutes of the Undergraduate and Graduate Councils.

That is, the Department of Geological Sciences is changing its name to Earth and Planetary Sciences. I am not certain if there is a clear procedure for doing this.

Lorayne Lester, who has seen some of these name changes, believed that the Provost needed to approve this first. He has. Naturally the College has approved also. Anne Mayhew believes that it is not necessary for the Undergraduate and Graduate Councils to vote on this. She does, however, believe this needs to appear in the minutes as an informational item. Geology wants this, needs this, change to appear in the next catalog. They want to change "officially" July 1.

So, can an announcement appear in the agenda for the next round of Council meetings?

Don

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Don Richard Cox, Associate Dean for Academic Programs  
College of Arts and Sciences, 26 Alumni Memorial Building  
University of Tennessee, Knoxville, TN 37996-1320  
Ph.: 865.974.6514 Fax: 865.974.4352

**CC:** <ljolly@utk.edu>

## COLLEGE OF COMMUNICATION AND INFORMATION

Change School of Journalism and Broadcasting

**TO: School of Journalism and Electronic Media**

Change subject area (courses) from Broadcasting

**TO: Electronic Media**

Change Communication concentration (MS and PhD) from Broadcasting

**TO: Electronic Media**

THE UNIVERSITY OF TENNESSEE



College of Communication and Information  
Office of the Dean  
302 Communications-University Extension Building  
Knoxville, Tennessee 37996-0332  
(865) 974-3031  
FAX (865) 974-3896

### MEMORANDUM

TO: Brenda Rayman, Catalog Editor  
FROM: Faye D. Julian, Interim Dean   
DATE: February 20, 2003  
RE: Informational Item for Graduate Catalog

The Department of Broadcasting in the restructured College of Communication and Information has merged with the School of Journalism to form the new School of Journalism and Electronic Media. The name Electronic Media will replace the former Broadcasting.

The restructuring of the College of Communication and Information should be reflected in the FIELDS OF STUDY section of the 2003-2004 Graduate Catalog as follows:

FROM:

-Advertising (pages 48-49 of 2002-2003 Graduate Catalog)  
Advertising graduate courses

-Broadcasting (pages 68-69 of 2002-2003 Graduate Catalog)  
Broadcasting graduate courses

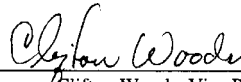
-Journalism and Public Relations (pages 134-135 of 2002-2003 Graduate Catalog)  
Journalism graduate courses

TO:

-Advertising and Public Relations  
Advertising graduate courses  
Public Relations graduate courses

-Journalism and Electronic Media  
Electronic Media graduate courses  
Journalism graduate courses

Approved:

  
Clifton Woods, Vice Provost

**Effective: Fall 2003**

## MEMORANDUM

**To:** Graduate Council Committee Members  
**From:** Tom George  
Associate Dean, College of Education, Health & Human Sciences  
**Re:** Curricular Materials for March 2003 Meeting  
**Date:** February 20, 2003

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Enclosed please find curricular proposals approved by the College of Education, Health, and Human Sciences' Curricular Review Committee. We are submitting these items for the March 2003 meeting of the Graduate Council. The following summary is provided for your convenience:

### **Sport & Leisure Studies Department**

Sport Studies: Add two courses for graduate credit

### **Theory & Practice in Teacher Education Department**

Reading Education: Offer a graduate course in a non-standard format

Science Education: Offer a graduate course in an electronically-mediated format.

Please contact me at 974-4125 if you have any questions or need additional information.  
Thank you.

# COLLEGE OF EDUCATION, HEALTH, AND HUMAN SCIENCES

## SPORT & LEISURE STUDIES

### Sport Studies

ADD

**Sport Studies 539 Research Development in Sport Psychology: Idea Formation to Data Collection (3)**

First of a two-semester sequence designed to familiarize students with research process in applied sport psychology. Includes idea formation, critical review of related literature, development of a research question and methodology, and data collection.

**Sport Studies 540 Research Development in Sport Psychology: Data Analysis to Manuscript**

**Submission(3)** Second of a two-semester sequence designed to familiarize students with research process in applied sport psychology. Includes data analysis, manuscript preparation and manuscript submission.

***Supporting information for both courses:***

- Rationale: Have been previously condensed and taught under a special topics number. While it proved to be a valuable experience for students, time limitations have prevented a more complete presentation of all states of the research process.
- Course format and location: Seminar format. Courses will be taught in a general purpose classroom and in accordance with the regular university calendar.
- Impact on other academic units: None. Focus of the course is limited to the research process in applied sport psychology.
- Financial Impact: None. The addition of a new faculty member in motor learning and control allows the faculty member who has been teaching classes in that area to offer the proposed course.

**Effective: Fall 2003**

## THEORY & PRACTICE IN TEACHER EDUCATION

### Reading Education

Non-Standard Format Course (existing course to be offered in non-standard format)

**Reading Education 534 Seminar in Reading Education (1-6)**

Course will meet May 21, 2003 through June 11, 2003. **Three credit hours.** Total number of contact hours is 46 across 21 calendar days.

**Effective: May 2003**

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THE UNIVERSITY OF TENNESSEE

NON-STANDARD FORMAT COURSE REQUEST  
FOR THE GRADUATE COUNCIL

**DATE SUBMITTED:** 1/27/03

**CONTACT**

Academic Unit: Theory & Practice in Teacher Education



Person: William G. Brozo  
Tel.#: 974-1920  
E-mail: wbrozo@utk.edu

**COLLEGE:** Education

**ACADEMIC DISCIPLINE:** Reading

**COURSE INFORMATION**

Number: READ EDUC 534

Course Title: Seminar in Reading Education (1-6)

Credit hours: three

Name of Special Topic or Workshop: Assistive Technology and Content Area Literacy

Instructor: Dr. Kathy Puckett & Dr. Bill Brozo

**Number of Credit Hours to be Awarded: three**

Projected Dates for Session: 5/21, 5/28, 5/29, 5/30, 6/2, 6/3, 6/4, 6/11

Total Number of Contact Hours: 46

Description of Course (include format and type of location in which course is taught):

This course is designed to provide teachers with evidence-based strategies related to assistive technology and content area literacy. Teachers will learn how to design technology-based content literacy instructional applications for students with special needs using the resources of the University of Tennessee's Technology Enhanced Curriculum Lab in the College of Education. The course will be formatted to include lecture, demonstration, experiential learning, and supervised laboratory time.

**EFFECTIVE TERM :** Begins in May intersession and concludes the second week of first summer term

**PLEASE PROVIDE THE FOLLOWING SUPPORTING INFORMATION:**

Can course be used in partial fulfillment of degree requirements? ☒ Yes ☐ No  
If no, explain.

Explain why the non-standard format is suitable for the subject matter.

This workshop/course has been designed in fulfillment of the requirements for funding through the "Improving Teacher Quality Grant Program" in the state of Tennessee. The grant stipulates that a workshop/course be made available to special and general education teachers for the purpose of training them in the use of assistive technology and content area literacy. Because of the time-intensive nature of learning about and becoming facile with a variety of current assistive technology software and hardware, five workshop sessions will comprise eight hours--seven spent as a whole group and one in a supervised laboratory. These five workshop days will be supported by three 2-hours sessions covering pre and post assessment, presentation of projects, and conferencing. This course spans the mini-session/first summer session timeframe to take advantage of the availability of assistive technology consultants and the availability of the TEC lab in Claxton prior to periods of high demand.

How will student learning be evaluated?

Students will be evaluated based on their performance of the following: (1) Post-workshop knowledge test consisting of paper and pencil as well as application items; (2) School-based special and general education team assistive technology/content area literacy plan; and (3) School-based special and general education team presentation/demonstrations of assistive technology/content literacy plan.

Will students go more than a week without being in class? ☐ Yes ☒ No  
If yes, how will the instructor maintain contact?

Does the course cover the same amount of material as a comparable standard format course?  
☒ Yes ☐ No If no, explain.

**PLEASE ATTACH A SYLLABUS WITH COURSE ASSIGNMENTS AND ATTENDANCE POLICY**

**READ EDUC 534**

**SEMINAR IN READING:  
ASSISTIVE TECHNOLOGY AND CONTENT AREA LITERACY**

**Dr. Kathy Puckett**

**Dr. Bill Brozo**

**Credit Hours: 3**

**Course Description**

This unique workshop course is designed to provide teachers with evidence-based strategies related to current assistive technology and content area literacy. Teachers will work in special and general education teams as they gain hands-on experience with a variety of assistive technology software and hardware. These teams will also learn ways to combine their expertise to create supportive inclusion environments for helping students with disabilities learn useful content area literacy strategies with technology.

**Course Objectives**

As a result of this course, teachers will be able to:

- \* Demonstrate understanding of important research foundations for content area literacy and assistive technology
- \* Operate a variety of assistive technology applications for use with special needs students
- \* Display knowledge of a range of effective, evidence-based content area literacy strategies and be able to apply and adapt these strategies to the learning needs of students with disabilities
- \* Link content literacy strategies and assistive technology to make the general curriculum accessible to the learning needs of students with disabilities

**Evaluation and Attendance**

Teacher participants will be evaluated based on their performance of the following:

|                                                                                      |            |
|--------------------------------------------------------------------------------------|------------|
| Post-Workshop Course Knowledge Test                                                  | 100 points |
| Co-Authored Assistive Technology/Content Area Literacy Plan in Web-Based Format      | 100 points |
| Presentation/Demonstration of Co-Authored Assistive Technology/Content Literacy Plan | 100 points |

**TOTAL POINTS** **300**

Teacher participants are expected to attend each workshop course session. Any single daily absence will result in a reduction of 10 points.

A = 300 - 270 pts; B = 269 - 240pts; C = 239 - 210pts

**Required Materials**

All necessary software and course materials will be provided by funding from the THEC Improving Teacher Quality Program: "Project ACCESS: Using Assistive Technology to Access Content Area Literacy in Special Education."

**Tentative Schedule**

Sessions 1, 7 and 8 will be two hours in length; sessions 2 -6 will be eight hours in length. Sessions will begin May 21 and conclude June 11, 2003.

| <u>Session</u>     | <u>Topic</u>                                                                                                                                                                                                               | <u>Instructional Format</u>                                                                                                         |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1 (2hrs)<br>May 21 | Pre-test and survey<br>Orientation, website review <a href="http://web.utk.edu/~access">http://web.utk.edu/~access</a>                                                                                                     | Pre-assessment<br>Lecture, hands on training                                                                                        |
| <u>Session</u>     | <u>Topic</u>                                                                                                                                                                                                               | <u>Instructional Format</u>                                                                                                         |
| 2 (8hrs) May<br>28 | Overview: Assistive Technology Tools Content Area Literacy,<br>Universal Design for Learning<br><br>Assistive Technology to Support Pre-Reading Strategies: Multi-media, text<br>to speech word processing, digital images | Lecture<br><br>Hands-on training: Intellipics Studio,<br>Intellitalk, digital cameras and other digital<br>images, use of templates |
| <u>Session</u>     | <u>Topic</u>                                                                                                                                                                                                               | <u>Instructional Format</u>                                                                                                         |

|                     |                                                                                                                                                                                                        |                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 3, (8hrs) May<br>29 | Pre-Reading Strategies: SQPR, Anticipation Guides, PrEP, Content Area Vocabulary Development, Text Impressions Experiential Learning                                                                   | Lecture/ demonstration                                                           |
|                     | Putting it all together: Pre-reading strategies supported by assistive technology                                                                                                                      | Independent Time on Computers with Instructional Support                         |
|                     | Special/General Education Team curriculum development                                                                                                                                                  | <i>Experiential learning: Open Lab Try-Outs</i>                                  |
| <u>Session</u>      | <u>Topic</u>                                                                                                                                                                                           | <u>Instructional Format</u>                                                      |
| 4 (8hrs) May<br>30  | During Reading Strategies: study guides, visualizing text structure, venn diagrams                                                                                                                     | Lecture                                                                          |
|                     | Assistive technology to support during reading strategies: previously learned applications                                                                                                             | Demonstration/ Experiential learning                                             |
|                     | During Reading Strategies: DRTA, gisting, scrambled paragraphs                                                                                                                                         | Lecture/Demonstration                                                            |
|                     | Assistive Technology to Support During Reading Strategies: Basic procedures for digitizing text , programs that offer text to voice scanning: applying reading support strategies to specific programs | Hands-On Training Kurzweil 3000: scanning, general use, reading support features |
|                     | Putting it all together: During-reading strategies supported by assistive technology                                                                                                                   | Independent Time on Computers with Instr. Support                                |
|                     | Special/General Education Team curriculum development                                                                                                                                                  | <i>Open Lab Try-Outs</i>                                                         |
| <u>Session</u>      | <u>Topic</u>                                                                                                                                                                                           | <u>Instructional Format</u>                                                      |
| 5 (8hrs) June 2     | Post-Reading Strategies: RAFT, SPAWN Story Paths                                                                                                                                                       | Lecture                                                                          |
|                     | Assistive Technology to Support Post- Reading Strategies: Concept mapping, student generated reports using multi-media and voice to text word processing for writing support.                          | Hands on training: Inspiration, Kidspiration, Naturally Speaking                 |
|                     | Adaptations for physical disabilities: Accessibility Options for Mac and Windows                                                                                                                       | Hands on training                                                                |
|                     | Putting it all together: Post-reading strategies supported by assistive technology                                                                                                                     | Independent Time on Computers with Instructional. Support                        |
|                     | Special/General Education Team curriculum development                                                                                                                                                  | <i>Open Lab Try-Outs</i>                                                         |
| <u>Session</u>      | <u>Topic</u>                                                                                                                                                                                           | <u>Instructional Format</u>                                                      |
| 6 (8hrs) June 3     | Development of Technology/Content Area Literacy Plans                                                                                                                                                  | Work in school teams with instructor support                                     |
|                     | Reporting results to colleagues in on-line format                                                                                                                                                      | Posting of plans in lesson plan data base                                        |
| <u>Session</u>      | <u>Topic</u>                                                                                                                                                                                           | <u>Instructional Format</u>                                                      |
| 7(2 hrs) June 4     | Report and presentations of Technology/Content Area Literacy Plans                                                                                                                                     | General/Special education team presentations                                     |
|                     | Individual review of team projects                                                                                                                                                                     | Conferencing                                                                     |
| <u>Session</u>      | <u>Topic</u>                                                                                                                                                                                           | <u>Instructional Format</u>                                                      |
| 8(2 hrs) June<br>11 | Post test and survey, course evaluation                                                                                                                                                                | Post assessment                                                                  |
|                     | Receive final projects                                                                                                                                                                                 | Conferencing                                                                     |

## THEORY AND PRACTICE IN TEACHER EDUCATION

### Science Education

#### Electronically-Mediated Format Course

**Science Ed 565 Instructional Trends and Issues in Science Education (3)**

Technology-enhanced course offered during the full summer term. The course will require approximately 100 hours of student time (9 hours per week). On campus for three 4-hour sessions. On-line for weekly participation in one-hour synchronous chat session, asynchronous regular email and listserv requirement, and use of course Blackboard site for access to PowerPoint presentations and other materials and links.

**Effective: Summer 2003**

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**THE UNIVERSITY OF TENNESSEE**

**REQUEST FOR ELECTRONICALLY-MEDIATED FORMAT COURSE\*  
FOR THE GRADUATE COUNCIL**

**New graduate courses or graduate courses currently offered in a traditional format that are to be taught in an electronically-mediated format must be approved by the Graduate Council. Electronic-mediated courses are those that use internet- or video-based components as a significant means of distributing information and creating and managing student-instructor interaction. These courses may or may not fall within the standard timetable established by the University.**

**DATE SUBMITTED:** 11-12-02

**CONTACT:**

- **Academic Unit:** TPTE
- **Person:** Michael Bentley
- **Tel.#:** 974-3656
- **E-mail:** mbentle1@utk.edu

**COLLEGE:** CEHHS

**ACADEMIC DISCIPLINE:** Science Education

**COURSE INFORMATION:**

- **Course Number:** SciEd 565
- **Credit Hours:** Three (3)
- **Course Title:** Instructional Trends and Issues in Science Education
- **Instructor:** Michael Bentley
- **Number of Credit Hours to be Awarded:** Three (3)
- **Total Number of Weeks:** Eleven (11) (offered for full summer term)
- **Total Expected Student Time Commitment:** Approximately 100 hours (9 hrs/wk)
- **Course Designation:** Technology-Enhanced
- **Course Description:** Analysis of current trends in science education, analysis of instructional issues facing elementary, secondary, and community college science teachers, and application of learning theory to teaching the biological, physical, and environmental sciences. Prereq: 496, teaching methods, or equivalent.
- **Student Site Requirements (for example: on campus three times a week, on campus once a week and access to on- or off-campus synchronous video twice a week, etc.):**

On campus for three (3) 4 hours sessions: beginning, middle, and end of course. On-line for weekly participation in one-hour synchronous chat session (seminar), asynchronous regular email and listserv requirement, and use of course Blackboard site (online.utk.edu) for access to PowerPoint presentations and other course materials and web links.

**EFFECTIVE TERM:** Summer (July, 2003)

PLEASE PROVIDE THE FOLLOWING SUPPORTING INFORMATION:

- **What is the nature and quantity of structured student/instructor interaction?**

Structured student/instructor interaction in the course includes three in-person meetings on campus, eight one hour synchronous online seminars (using chat), and regular email and discussion board postings and responses. In addition students will be required occasionally during the term to submit a written assessment or critique of a specific current issue or event, and to react in writing to instructor-produced PowerPoint presentations posted to the course website.

- **What is the nature and quantity of structured student/student interaction**

Student-student interactions include three in-person class meetings on campus, weekly (as specified in the syllabus) small group meetings (either in person or in online chat sessions or both, as students arrange) to discuss assignments and readings, regular email communication, and one self-guided field trip to an agency of informal science education which may be accomplished as a team/group activity.

- **Can course be used in partial fulfillment of degree requirements? If no, explain.**

Yes

- **Explain why the mode of course delivery is suitable for the subject matter.**

The course has been taught in the past in a seminar format based upon assigned readings in the relevant literature, class discussion, and student projects or term papers. The enhanced technology version of the course retains the focus on the professional literature while expanding the use of web-based learning techniques and local community resources (with the self-guided field trip). The three in-person on-campus sessions spaced at the beginning, middle and end of the course, weekly synchronous on-line seminars, and required regular email exchanges provide for interaction between instructor and students and for adequate student monitoring during the course.

- **How will student learning be evaluated?**

As delineated in the syllabus, students will be evaluated on the quality of four major assignments (critical autobiography, concept interview, book review, and term paper/project), three web quests, course participation (which includes class attendance for three campus meetings and engagement in eight one-hour online seminars and one self-guided field trip to agency of informal science education), and a final examination. Rubrics are provided for major written assignments.

- **Does the course cover the same amount of material as a comparable standard format (classroom) course? If no, explain.**

Yes

**PLEASE ATTACH A SYLLABUS WITH COURSE ASSIGNMENTS AND ATTENDANCE POLICY.**



UNIVERSITY OF TENNESSEE  
Ed 565 INSTRUCTIONAL TRENDS AND ISSUES IN SCIENCE EDUCATION • Summer, 2003  
**Syllabus**

Class meeting in Claxton Addition 428: M 4:40-7:35 pm • & online at [online.utk.edu/](http://online.utk.edu/)

Instructor: Michael L. Bentley, EdD ([mbentle1@utk.edu](mailto:mbentle1@utk.edu))

Office: A404 Claxton Complex • Ph. 974-3656 • Secretary: Shauna Cook 974-7712

CATALOG DESCRIPTION:

Analysis of current trends in science education, analysis of instructional issues facing elementary, secondary, and community college science teachers, and application of learning theory to teaching the biological, physical, and environmental sciences. Prereq: 496, teaching methods, or equivalent. *3 semester hours*

COURSE GOALS:

Students will be provided opportunity to:

- consider science education (instruction, curriculum, and assessment) trends and issues locally, nationally and internationally;
- examine science education from kindergarten through community college;
- gain awareness of informal in relation to formal science education;

- assess obstacles facing teachers in enacting the science curriculum;
- review developments in the foundational scholarly fields, including, current learning theories in relation to science education and
- compare the outcomes of different curricula/types of instruction and modes of evaluation on students' achievement and perceptions of science;
- interpret specified research in science education.

#### **ONLINE COURSE PROCESS:**

The nature of an on-line course dictates a significant degree of independent work. I will provide you with the resources, experience, and guidance; you assume the responsibility for managing your time, learning the material, and completing assignments on time. It is essential that you read your email frequently each week, as "professor's notes" and updates to your assignments will be sent to you via email. I have designed this course so that readings are assigned each week:

- Selected chapters of the text book and other texts (some accessed via the internet)
- My "professor notes".

Additionally, some weeks you will be instructed to access PowerPoint presentations posted to the Ed 565 course Blackboard site ([online.utk.edu](http://online.utk.edu)), view selected websites, or read/view documents or graphic organizers posted to the "Course Materials" folder on the course Blackboard site. You will be asked to react via posting to the Discussion Board through [online.utk.edu](http://online.utk.edu).

During the Initial Meeting, groups will be created for the purpose of weekly student-to-student communication and cooperative group activities. Each group will arrange times for weekly group discussions through the chat function, [online.utk.edu](http://online.utk.edu).

#### **ASSIGNMENTS AND EVALUATION:**

Summary of Assignments and Grade Weighting

- (1) PARTICIPATION: *Attendance and engagement in course-related activities (three campus meetings, eight one hour online seminars, one self-guided field trip to agency of informal science education), preparedness, communication and cooperation with others*, 10%
- (2) CRITICAL AUTOBIOGRAPHY AS A SCIENCE LEARNER: Due Week2, 10%
- (3) WEB QUESTS: Three, due as assigned: 15%
- (4) CONCEPT INTERVIEW: Due second meeting, Week 6, 20%
- (5) BOOK REVIEW & PRESENTATION: Due Week 9, 10%
- (6) TERM PAPER/PROJECT: Due final meeting, Week 11, 20%
- (7) FINAL EXAMINATION: 15%

For detailed assignment explanations and rubrics, see the "assignments" folder on the Ed 565 course Blackboard web site ([online.utk.edu](http://online.utk.edu)).

#### **TEXTBOOKS:** Required

National Research Council. (1996). National Science Education Standards. Washington DC: National Academy Press. (Available <http://books.nap.edu/html/nses/html/index.html> / ISBN 0-309-05326-9)

Science Framework for Tennessee. The curriculum frameworks, content and performance standards, and grade level competencies can be accessed as pdf files (Science K-8/9-12) at: [www.k-12.state.tn.us/frameworks/](http://www.k-12.state.tn.us/frameworks/).

Readings will also be assigned from the magazine published by the Eisenhower National Clearinghouse for Science and Mathematics (ENC):

*ENC Focus*, Vol. 8, #2, Vol. 9, #s 2, 3 and 4, and Vol. 10 #1 (provided).

Choose one of the following for the book review and presentation assignment:

Bybee, R.W. (Ed.). (2002). Learning science and the science of learning. Arlington, VA: National Science Teachers Association. (ISBN 0873552083)

Bowers, C. A. (1993). Education, cultural myths, and the ecological crisis. Albany: State University of New York Press.

Committee on How People Learn: Targeted Report for Teachers, National Research Council. (2002). How students learn: History, math and science in the classroom. Washington, DC: National Academy Press. (ISBN 0-309-07433-9).

Crowley, K., Schunn, C., & Okada, T. (2001). Designing for science: Implications from everyday, classroom, and professional settings. Mahwah, NJ: Lawrence Erlbaum. (ISBN 0-8058-3474-5).

Glynn, S.M. & Duit, R. (Eds). (1995). Learning science in the schools: Research reforming practice. Mahwah, NJ: Lawrence Erlbaum. (ISBN 0-8058-1807-3).

Hartman, H.J. & Glasgow, N.A. (2001). Tips for the science teacher: Research-based strategies to help students learn. Thousand Oaks, CA: Corwin Press. (ISBN 0-7619-7589-6).

Hodson, D. (1998). Teaching and learning science: Towards a personalized approach. London: Open University Press. (ISBN 0-335-20115-6).

Howes, E.V. (2002). Connecting girls and science: Constructivism, feminism, and science education reform. New York: Teachers College Press. (Ways of Knowing in Science and Mathematics Series, ISBN 0807742104)

Llewellyn, D. (2001). Inquire within: Implementing inquiry-based science standards. Thousand Oaks, CA: Corwin Press. (ISBN 0-7619-7745-7).

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Torp, L. & Sage, S. (1998). Problems as possibilities: Problem-based Learning for K-12 education. Alexandria, VA: Association for Supervision and Curriculum Development. (ISBN 0-87120-297-2)

Wellington, J. & Osborne, J. (2001). Language and literacy in science education. London: Open University Press. (ISBN 0-335-20598-4).

#### **COURSE SCHEDULE:**

**Initial Meeting 4:40-7:35 pm Tues. June 3.** Introductions and review of syllabus

Topic: ***The Context of Science Education in our Day***

Assigned reading for the first week: Tennessee Science Framework (K-8 OR 9-12) and the *National Science Education Standards*, Overview and Chap. 1 & 2, *ENC Focus*, 8(2), pp. 14–15, pp. 50-53 (find and peruse one or two of the online resources as suggested in the latter).

Assignment: CRITICAL AUTOBIOGRAPHY OF A SCIENCE LEARNER due in one week (by June 10); submit to the Drop Box, online.utk.edu, as a WORD document (.doc) or in rich text format (.rtf).

Email: Introduce yourself, summarizing your interests and pastimes and stating your career goals. Send email to mbentle1@utk.edu.

**Week 2 (June 10).** On-line Seminar (chat session 4:30-5:30 pm Tues.)

Topic: ***US Science Education since WW II and Standards-based Science Education***

Assigned readings: *NSES*, Content Standards (NRC, 1996, pp. 103-207, focusing on pp. 143-204).

URL: Look at the US DOE website and click on the link to the *Nation's Report Card* – specifically for science and then the TIMSS site, linked from this page:  
<http://www.ed.gov/topics/topicsTier2.jsp?&top=Education+Resources&subtop=Math+%26+science>

Conduct Web Quest 1: Identifying educational stances of the professional community.

**Week 3 (June 17).** On-line Seminar (chat session 4:30-5:30 pm Tues.) Discussion of Reading

Issue: ***Teaching science in an era of standards-based education and high stakes testing***

Assigned reading: Read the *National Science Education Standards*, Teaching Standards (NRC, 1996, pp. 27-53).

Due: Web Quest 1 – submit to Drop Box as WORD (.doc) or rich text format (.rtf) document.

Assignment: **Self-guided Field Trip**. Visit an agency of informal science education (a science museum, nature center, zoo, aquarium, etc.) of your choice (do this between June 17-July 1). Download the assignment guide and evaluation form from Ed565 Blackboard course site, online.utk.edu.

**Week 4 (June 24).** On-line Seminar (chat session) Discussion of Reading

***Standards-based Education vs. Alternatives in Science Education***

Assigned reading: *NSES* Program standards, NRC, 1996, pp. 209-225, 239-240, 77, 100

URL: Alternative models for secondary science, visit [www.communityhigh.net](http://www.communityhigh.net) and do search: “model K-12 science programs”.

Due by July 1: Field Trip summary and evaluation.

Conduct Web Quest 2 The pros and cons of standards-based science education.

**Week 5 (July 1).** On-line Seminar (chat session 4:30-5:30 pm Tues.) Discussion of Reading  
**Issue: Teacher Epistemologies and the Nature of Science**  
Assigned reading: *ENC Focus*, 9(3), pp. 14-15, 46-47;  
Selections from Jay L. Lemke, *Talking science*, 1990 (Blackboard site). Also see:  
<http://academic.brooklyn.cuny.edu/education/jlemke/>.

Due: Web Quest 2

**Week 6 (July 8). Second Meeting (A428 Claxton Complex, 4:40-7:35 pm Tues.)**  
Taking stock. Discussion of field trip experience, assignments and readings.  
Focus topic: **Teacher Epistemologies and the Nature of Science**  
Assigned reading: *ENC Focus*, 9(3), pp. 38-39;  
Machamer, P. (1998). Philosophy of science: An overview for educators. *Science & Education*, 7, 1-11 (available, Course Materials folder, online.utk.edu)

Due: Concept Interviews

**Week 7 (July 15).** On-line Seminar (chat session 4:30-5:30 pm Tues.) Discussion of reading  
**Issue: Pedagogy: Inquiry and the Outcomes of Indirect vs. Direct Instruction**  
Assigned reading: *ENC Focus*, 8(2), pp. 34-36; 9(3), pp. 22-29; 9(2), pp. 12-15, 26-28, 34-35, 47, 51, 54, 56.

URL: Examine inquiry learning resources on the web (see links, Resources folder, online.utk.edu).

Conduct Web Quest 3: Multiculturalism-Anti-racism and Science Education.

**Week 8 (July 22).** On-line Seminar (chat session 4:30-5:30 pm Tues.) Discussion of reading  
**Issue: Multiculturalism, ESL, Gifted, Special Education.**  
Assigned reading: Cobern, W.W., & Loving, C.C. (1998). Defining "Science" in a Multicultural World: Implications for Science Education. Paper presented at NARST, available "Course Materials" folder, online.utk.edu

Due Web Quest 3

**Week 9 (July 29).** On-line Seminar (chat session 4:30-5:30 pm Tues.) Discussion of reading  
**Issue: Technology in Science Education.**  
Assigned reading: *ENC Focus*, 9(2), pp. 8-9, *ENC Focus*, 8(2), pp. 40-42.

Due Second Textbook Presentation

**Week 10 (Aug. 5).** On-line Seminar (chat session 4:30-5:30 pm Tues.) Discussion of reading  
**Issue: Assessment and Evaluation in Science Education**  
Assigned reading: *ENC Focus*, 8(2), pp. 37-38, *ENC Focus*, 10(1).  
  
URLs: search for information on assessment and evaluation on these two sites: Association for Supervision and Curriculum Development, <http://www.ascd.org>  
Phi Delta Kappa, <http://www.pdkintl.org/> / PDK Archived articles: <http://www.pdkintl.org/kappan/karticle.htm>

**Week 11 (Aug. 12) Final Meeting (A428 Claxton Complex, 4:40-7:35 pm Tues.).**  
Taking stock. Discussion of readings and investigations.  
Focus topic: **Trends and issues in international science education**

Paper/project due, presentations and discussion.  
Course evaluation.

#### CHECKLIST OF COURSE REQUIREMENTS

All assignments are due on Fridays at 5:00PM except as announced by Instructor

| Week/<br>Due Date    | Activity                                                                              | Drop<br>Box | Discussion<br>Board | Response(s) | Small<br>Group | E-Mail |
|----------------------|---------------------------------------------------------------------------------------|-------------|---------------------|-------------|----------------|--------|
| Week 2<br>Jun 10, 03 | Roadmap & Critical Autobiography of A Science Learner                                 | X           |                     |             | X              |        |
|                      | NRC <i>Standards</i> , Overview & Chap. 1 & 2, <i>ENC Focus</i> , 8(2), 14-15, 50-53. |             |                     |             | X              |        |
|                      | Personal Data/Goals                                                                   |             |                     |             |                | X      |
| Week 3<br>Jun 17     | NRC <i>Standards</i> – Content, pp. 103-207.                                          |             |                     |             | X              |        |
|                      | URL: US DOE                                                                           |             | X                   |             |                |        |
|                      | Web Quest 1: Science Ed                                                               | X           |                     |             | X              |        |



|                   |                                                                                         |   |   |   |   |   |
|-------------------|-----------------------------------------------------------------------------------------|---|---|---|---|---|
|                   | Organizations                                                                           |   |   |   |   |   |
| Week 4<br>Jun 24  | NRC <i>Standards</i> – Program standards, 209-225, 239-240, 77, 100.                    |   |   |   | X |   |
|                   | URL: program search & <a href="http://www.communityhigh.net">www.communityhigh.net</a>  |   | X |   |   |   |
|                   | Progress/Concerns Check                                                                 |   |   |   |   | X |
| Week 5<br>Jul 1   | <i>ENC Focus</i> , 9(3), 14-15, 46-47.                                                  |   |   |   | X |   |
|                   | Jay Lemke article                                                                       |   | X | X | X |   |
|                   | Web Quest 2: Standards-based science education                                          | X |   |   | X |   |
|                   | Self-guided field trip                                                                  | X |   |   | X |   |
| Week 6<br>Jul 8   | Mid-term Class Meeting<br>A\$28 Claxton Complex                                         |   |   |   |   |   |
|                   | Concept Interview assignment due                                                        | X |   |   | X |   |
|                   | Machamer article on philosophy of science                                               |   | X | X | X |   |
|                   | <i>ENC Focus</i> , 9(3), 38-39.                                                         |   |   |   | X |   |
| Week 7<br>Jul 15  | <i>ENC Focus</i> , 8(2), 34-36; 9(3), 22-29; 9(2), 12-15, 26-28, 34-35, 47, 51, 54, 56. |   |   |   | X |   |
|                   | URL: inquiry learning                                                                   |   | X |   |   |   |
| Week 8<br>Jul 22  | Web Quest 3: Multiculturalism & Anti-racism in Science Ed                               | X |   |   | X |   |
|                   | Cobern & Loving article Defining "Science" in a Multicultural World                     |   | X | X | X |   |
|                   | Progress/Concerns Check<br>Project rubric proposal                                      |   |   |   |   | X |
| Week 9<br>Jul 29  | <i>ENC Focus</i> , 9(2), 8-9; 8(2), 40-42                                               |   |   |   | X |   |
|                   | Second Textbook Presentation                                                            | X |   |   | X |   |
| Week 10<br>Aug 5  | <i>ENC Focus</i> , 8(2), pp. 37-38; 10(1).                                              |   |   |   | X |   |
|                   | URL: Assessment & evaluation                                                            |   | X |   |   |   |
| Week 11<br>Aug 12 | Paper/project due                                                                       | X |   |   | X |   |
|                   | FINAL EXAM                                                                              | X |   |   |   |   |

#### **SELECT REFERENCES:**

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Committee on Programs for Advanced Study of Mathematics and Science in American High Schools, National Research Council. (2002). Learning and understanding: Improving advanced study of mathematics and science in U.S. high schools. Washington, DC: National Academy Press. [available: <http://www.nap.edu/books/0309074401/html/>]

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Persall, M. (Ed.). (1991). The relevant research. Washington, DC: National Science Teachers Association.

Ready, T., Edley, Jr. C., & Snow, C.E. (Eds.), National Research Council. (2002). Achieving high educational standards for all: Conference summary. Washington, DC: National Academy Press. [available: <http://www.nap.edu/books/0309083036/html/>]

Rhoton, J. & Bowers, P. (Eds.)(1996). Issues in science education. Arlington, VA: National Science Teachers Association.

Rutherford, F.J. (1990). Science for all Americans. New York: W.W. Norton.

[or: American Association for the Advancement of Science. (1989). Science for all Americans (Project 2061). Washington, D.C.: American Association for the Advancement of Science.]

Texley, J. & Wild, A. (Eds.)(1996). NSTA Pathways to the National Science Education Standards, High School Edition, Arlington, VA: National Science Teachers Association. (or Elementary or Middle School version).

#### **ADDITIONAL RESOURCES:**

Note: A complete course bibliography and web links can be accessed at [online.utk.edu](http://online.utk.edu).

#### **PROFESSIONAL ORGANIZATIONS AND JOURNALS**

NSTA National Science Teachers Association [www.nsta.org](http://www.nsta.org)  
K-5 *Science and Children* 6-8 *Science Scope*  
9-12 *The Science Teacher* Coll *Journal of College Science Teaching*  
TSTA Tennessee Science Teachers Association [cesme.utm.edu/TSTA/tsta.html](http://cesme.utm.edu/TSTA/tsta.html)  
TEEA Tennessee Environmental Education Association <http://www.utm.edu/departments/ed/cece/TEEA.html>  
NMLSTA National Middle Level Science Teachers' Association [www.nsta.org/nmlsta/](http://www.nsta.org/nmlsta/)  
NAAEE The North American Association for Environmental Education [www.naaee.org/](http://www.naaee.org/)  
NMEA National Marine Educators Association [www.marine-ed.org/](http://www.marine-ed.org/)  
SSMA School Science and Mathematics Association [www.ssma.org/](http://www.ssma.org/)  
ACS American Chemical Society [www.acs.org](http://www.acs.org)  
*Journal of Chemical Education* [jchemed.chem.wisc.edu](http://jchemed.chem.wisc.edu)  
NABT National Association of Biology Teachers [www.nabt.org](http://www.nabt.org)  
*The Biology Teacher*  
AAPT American Association of Physics Teachers [www.aapt.org](http://www.aapt.org)  
*The Physics Teacher*  
NAGT National Association of Geoscience Teachers. [www.nagt.org](http://www.nagt.org)  
*Journal of Geoscience Education*  
NARST National Association for Research in Science Teaching [www.educ.sfu.ca/narstsite/](http://www.educ.sfu.ca/narstsite/)  
*Journal of Research in Science Teaching*  
[www3.interscience.wiley.com/journalfinder.html](http://www3.interscience.wiley.com/journalfinder.html)  
WILEY *Science Education*.... [www3.interscience.wiley.com/journalfinder.html](http://www3.interscience.wiley.com/journalfinder.html)

#### **GENERAL POLICIES:**

In terms of mechanics, all written work is expected to be at a professional standard. Papers are to be submitted to the Drop Box at [online.utk.edu](http://online.utk.edu) as WORD (.doc) or rich text format (.rtf) documents that are double-spaced, standard margins, fronted with a rubric and identification of author, course, title, and date, and referenced in a standardized format.<sup>1</sup>

**During the three class meetings, please turn off cell phones. There will be a fifteen (15) minute class break. Any student with special needs or circumstances is encouraged to meet with me after the first class meeting. The Office of Disability Services can be contacted at 974-6087.**

[Note: the following information will be posted to the SciEd565 course Blackboard site]

SciEd565: Summary of Assignments and Grade Weighting

- (1) PARTICIPATION (includes self-guided field trip report): 10%
- (2) CRITICAL AUTOBIOGRAPHY: Due Week II, 10%
- (3) WEB QUESTS, Due Weeks 3, 5, & 9, 15%
- (4) CONCEPT INTERVIEW: Due Meeting II, 20%
- (5) BOOK REVIEW & PRESENTATION: Due Week 9, 10%
- (6) PAPER/PROJECT: Due Meeting III, 20%
- (7) FINAL EXAM: 15%

#### ***Participation***

Includes attendance and engagement in course-related activities, preparedness, communication and cooperation with others. Course-related activities include three in-person meetings on campus, eight one hour synchronous online seminars, weekly (as specified in the syllabus) small group meetings (in person or in online chat sessions), one self-guided field trip to an agency of informal science education, and regular email and discussion board postings as specified in the syllabus. Your presence at the three course meetings and active involvement in class discussion and activities is necessary for you and others to get the most out of this course. You may also be required occasionally during the term, to submit a written assessment or critique of a specific current issue or event, and that will require additional reading, and to react in writing to PowerPoint presentations posted to the course website.

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<sup>1</sup>The APA style is preferred. For a concise style manual, see course Blackboard site.

## ***Self-Guided Field Trip Report***

**PURPOSE:** This assignment aims to provoke reflection on the role of informal science education institutions in public education and on the possibilities for collaboration of formal and informal science education in developing classroom curriculum.

**THE TASK:** This assignment can be accomplished in teams or groups. Begin by selecting an agency to visit and finding out its hours of operation. You should try to visit an institution new to you or one not visited for many years. Plan to spend 2-3 hours minimum and to have materials for taking notes, and, if available, a digital camera (however, analog photos could be scanned). Call ahead and ask to speak to a staff member in the agency's education department. Have them mail you or find out if you can obtain on-site the brochures and materials about the agency's K-12 programs for school groups. Examine these materials in preparing your report. During your actual on-site visit, first take a walk through the entire exhibit area in order to get a quick overview of the content. Then go back to two or three exhibits you would like to scrutinize in more depth. In examining these exhibits, note the content for later comparison to the NSES or Tennessee Framework for grade level appropriateness. Note the quality of exhibit labels in terms of reading levels, length, readability, clarity, accuracy, etc. Observe how other visitors, especially children, are interacting with the exhibits and/or programs. Take pictures if allowed.

**Your written report** should include:

- identification and description of the museum, nature center, or other agency of informal science education visited (digital images may be included);
- summary of the science content of the agencies exhibits and outreach programs;
- how you would expect a student might respond to the exhibits/programs;
- connections between content of exhibits/programs and Tennessee Science Framework, Benchmarks, or NRC Standards;
- your critique (appreciations and criticisms) of exhibits, programs, performance of personnel, and
- your recommendations for improving the agency programs and/or for using the agency programs to supplement K-12 school science curriculum.

## ***Critical Autobiography***

**PURPOSE:** This assignment aims to help you reflect on your experiences as a science learner and, then, your beliefs about science teaching and learning. You are to explore links between events and people in your life and your personal educational theories. Learning is both a personal and social experience. We construct our own knowledge, but this is never in isolation, as we are constantly influenced by the socio-cultural situations in which we live. Sketching the 'Road Map' will help you recall your experiences and develop a 'critical autobiography.' The term 'critical' plays an important part in the reflective process as it is important to acknowledge that one's beliefs and values are influenced by one's socio-cultural surroundings.

**THE TASK:** Begin by designing a 'Road Map' - a life timeline - that illustrates your prior learning experiences and the individuals and institutions that have most shaped your development. Start with the earliest events and/or people that you can recall, next map out your years as a learner in and outside of school with events/people that stand out to you. Use the Road Map as a visual aid as you write a descriptive account of events and activities in your life, and of family, peers and teachers which you deem to be significant influences on your beliefs about what quality science education looks like. Design your Road Map and organize your autobiography as you feel appropriate, however both a graphic and written component are required.

**CONCLUDING:** As you examine your Road Map, think about how your beliefs and practices as a teacher and learner are rooted in the experiences that you have identified. Consider how your thoughts and actions have been socially influenced. Ask yourself, for example, if your gender, religious affiliation, or ethnicity somehow affected how you were involved as a child in specific learning experiences? Would you have preferred that things had gone differently for you? If so, how?

Writing a critical autobiography involves, finally, making a statement of your personal theory of teaching science – what you believe to be quality in this field, and so this means you are to reveal your preferred teaching and learning practices. Review your Road Map and autobiography and connect the significant formative experiences and personal affiliations to your present stance on how *you* will treat science in enacting curriculum in your own classroom.

**LEARNING ADVICE:** In looking critically at your background, think about the various socio-cultural *lenses* you wear as you look at schools and classrooms, as well as at others (students, fellow teachers, school administrators, school patrons, people of different ethnic and cultural origins, etc., and even other creatures, e.g. wildlife). In thinking about your personal theories (educational philosophy), ask yourself, for example, what you most value in learning outcomes; ask what you believe characterizes *quality* in a science program and science instruction in the school. What do you see when you visualize such a program in action?

Reference: Moscovici, H., Nichols, S., Habib, G., Tippins, D.J., & Sullivan, B. (1994). Reflective 'tools' for college teaching and learning. Panel presentation, AETS, El Paso, TX.

## **Rubric for Critical Autobiography Assignment**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

| <b>Criteria</b>                                                                                                  | <b>HIGH</b><br>Complete demonstrates depth of understanding (2)      | <b>SATIS-FACTORY</b><br>Mostly complete demonstrates adequate understanding (1) | <b>LOW</b><br>Response lacking / incomplete demonstrates little understanding (0) |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Comprehensiveness: identifies multiple events<br>- school and out-of-school learning                             |                                                                      |                                                                                 |                                                                                   |
| Significant influences described                                                                                 |                                                                      |                                                                                 |                                                                                   |
| Connections established between experiences and development of personal educational theories                     |                                                                      |                                                                                 |                                                                                   |
| Socio-cultural factors considered and related to personal educational theories                                   |                                                                      |                                                                                 |                                                                                   |
| Addresses the valued outcomes of the science program, and the characteristics of quality in the science program. |                                                                      |                                                                                 |                                                                                   |
| Quality of communication / mechanics, organization, clarity of meaning, focus, style                             | <b>HIGH</b><br>Consistently communicates ideas with support & detail | Communicates ideas satisfactorily, but missing elements detract                 | <b>LOW</b><br>Communicates sporadically; restrictive communication                |

#### **Comments:**

#### **Web Quests**

What is a Web Quest? It is a virtual field trip, a customized, guided investigation to be completed online. A Web Quest provides one or more specific research questions and suggested web sites that will provide needed information. Share your findings with the class in your weekly Small Groups.

**Web Quest 1:** Identifying educational stances in the professional community.

**The Task:** URLs for the web sites for organizations such as the NEA, AFT, and PDK, as well as organizations specific to science and environmental education, such as NSTA, SSMA, and NAAEE are provided in the syllabus. Other organization sites include:

- ASCD – Association for Supervision and Curriculum Development <http://www.ascd.org>
- AASA – American Association of School Administrators <http://www.aasa.org/>
- NAESP – National Association of Elementary School Principals <http://www.naesp.org>
- Phi Delta Kappa <http://www.pdkintl.org>
- National Association for the Education of Young Children <http://www.naeyc.org>
- National PTA <http://www.pta.org/>

Visit and explore the web sites of at least four (4) of these organizations, including at least one general organization or agency and one specific science education or EE organization. Look for position statements related to pedagogy or on educational issues. Identify and describe particular stances taken by the organizations you have picked. Compare stances among the four organizations. Do you find agreement/disagreement on any issues?

**Web Quest 2:** The pros and cons of standards-based science education.

**The task:** Review the following and additional sites of your own (using a search engine, such as Google.com) to identify pros and cons of standards-based science education:

- the Quality Counts 2001 Report: *Seeking Stability for Standards-Based Education*, [http://www.edweek.org/sreports/qc01/articles/qc01story.cfm?slug=17exec\\_sum.h20](http://www.edweek.org/sreports/qc01/articles/qc01story.cfm?slug=17exec_sum.h20) This report is a project of *Education Week*, a publication that supports standards-based reform.
- the Annenberg Guide to Math and Science Reform with its links to model programs: [http://www.learner.org/k12/The\\_Guide/](http://www.learner.org/k12/The_Guide/)
- the Education Resource Information Center Clearinghouse for Science, Mathematics, and Environmental Education (ERIC CSME): <http://www.ericse.org>

Describe the arguments for and against state or national standards and high-stakes testing in science education. Argue for your own view on the issue.

**Web Quest 3: Multiculturalism, Antiracism, and Science Education.**

**The task:** Read the essay, "Liberalism, Multiculturalism, and Education: Is There a Fit?" by Stacy Smith of Cornell University, on the Philosophy of Education Society website, at [http://www.ed.uiuc.edu/EPS/PES-yearbook/95\\_docs/smith.html](http://www.ed.uiuc.edu/EPS/PES-yearbook/95_docs/smith.html) (also see the response by Richard Brosio of Ball State University, linked to Smith's essay). Next, read the essay by Harry Dhand of the University of Saskatchewan entitled "Implications of Multiculturalism for Education: The Canadian Context, found at <http://www.ncert.nic.in/ncert/journal/journalnew/iechap5.htm>)  
Next, read the essay by Hal Dyck, "The Effects of Multiculturalism on Education" (<http://instructordiploma.com/core/102%20B/hal.htm>). Finally search the net for specific references for Multiculturalism in Science Education.

Finally, answer these questions:

- (1) What does multiculturalism mean for science education, i.e., what does it look like in the classroom and lab?
- (2) What objections have been raised to multicultural approaches?
- (3) What new ideas did you encounter from your web search?

**Rubric for Web Quests**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

| <b>Criteria</b>                                                                     | <b>Exceeds Minimum Requirement (2)</b>                | <b>Meets Minimum Requirement (1)</b>                                                        | <b>No response / incomplete (0)</b>                                                |
|-------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Web sites cited properly                                                            |                                                       |                                                                                             |                                                                                    |
| Adequacy of summary description                                                     |                                                       |                                                                                             |                                                                                    |
| Reactions to questions posed, critique (plusses-minuses/appreciation and criticism) |                                                       |                                                                                             |                                                                                    |
| Relevance/Suggested uses/Teacher's comments                                         |                                                       |                                                                                             |                                                                                    |
| Communication / mechanics, organization, clarity of meaning, focus, style           | Consistently communicates ideas with support & detail | Communicates most ideas, some missing elements due to lack of clarity or professional level | Communicates sporadically; lack of understanding restricts effective communication |

**Comments:**

**Concept Interview**

**PURPOSE:** To develop: (1) skill in listening, questioning, assessing, and evaluating student understanding, (2) sensitivity to students' conceptual development.

**WHAT TO DO:** You may work in teams. The task is to assess several students' understandings of specific science concepts. In interviewing each student, you can use drawings, photos, "props" (objects, models, etc.), activities, or demonstrations.

**Example**

*Topic:* motion (physical science)

*Concept:* Objects in motion tend to stay in motion unless acted upon by an outside force.

T: (rolls ball across table) "What did you see happen?"

S: "It slows down and stops."

T: "What happens to make the ball stop?"

**Note:** check how your topic is treated in science textbooks. A teacher's guide, if available, might also be helpful.

Write your questions in advance: Ask both divergent (open-ended) and convergent questions. An effective opening might be, “*Tell me what you know about...*” Your questions are a **guide**, but be ready to probe further in responding - seek elaboration and invent *ad hoc* questions to track a ‘meaning trail’.

Use a tape recorder so you can be more attentive and responsive during the interview. Interview at least *three* students (close relatives not eligible). Interview *one at a time* in a place away from distractions. A quiet, relaxed, non-threatening environment is best. Avoid a quiz-like situation and its attendant stresses. Typically, adolescents enjoy attention and will want to please you. Open with some ‘get-to-know-you’ questions. Assure the student that there are no wrong answers, that you are interested in his/her ideas and opinions. Don’t even think about correcting any misconceptions that turn up.

Listen to the tapes and make notes on interesting or significant responses. Analyze the results: describe and interpret each student’s concept(s). Compare the student’s with the scientific concept(s). Compare the students with each other.

Finally, discuss your ideas about instruction for any *one* student of your choosing.

**Your written report** should include:

- description of the interview process (your research protocol) - place, dates, times, procedure, and a list of the interview questions
- educationally relevant background of each subject;
- identification of the scientific concept(s)– description of the science involved;
- brief description of what you expect a student might understand at his/her developmental level;
- your findings about the understandings of each student – you should cite evidence from the responses, but NOT provide a transcript;
- comparison of the concepts between students, and the students’ concepts with the scientists’ concepts;
- a lesson plan for teaching **one** student you interviewed (give a reason for your choice);
- a list of the resources used, if any (e.g. textbooks, college methods texts, trade-books, teacher’s manuals, web sites, information from teachers, etc.);

### Rubric for Concept Interview

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

| <b>Criteria</b>                                                                    | Complete / demonstrates understanding (2)                                     | Mostly complete / demonstrates partial understanding (1)                               | No response / incomplete / demonstrates little understanding (0)                   |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Science concept(s) identified and described                                        |                                                                               |                                                                                        |                                                                                    |
| Questions effective in eliciting student ideas                                     |                                                                               |                                                                                        |                                                                                    |
| Appropriateness of interview procedures                                            |                                                                               |                                                                                        |                                                                                    |
| Evidence of probing, variety of types of questions, flexibility and responsiveness |                                                                               |                                                                                        |                                                                                    |
| Characterization of students’ concepts supported by evidence from interview        |                                                                               |                                                                                        |                                                                                    |
| Comparison of concepts among students                                              |                                                                               |                                                                                        |                                                                                    |
| Comparison of students’ & scientific concepts                                      |                                                                               |                                                                                        |                                                                                    |
| Quality of instructional plan for identified student                               |                                                                               |                                                                                        |                                                                                    |
| Communication / mechanics, organization, clarity of meaning, focus, style          | Consistently communicates ideas with support & detail, references appropriate | Communicates most ideas, some missing elements detract from clarity or professionalism | Communicates sporadically; lack of understanding restricts effective communication |

**Instructor’s Comments:**

### Book Review & Presentation

You may work on this assignment in dyads or individually. Choose a text from the list provided in the syllabus, or another relevant text, with permission. Read your selection critically, comparing the author's point of view and recommendations with those you have encountered in the National Science Education Standards (NRC, 1996) and/or other standards-based documents and articles studied in the course, as well as your own personal educational theories. Prepare a brief (approximately 2-3 page) book review that includes a summary of the book's contents, your critique, and any suggestions for teaching or classroom applications. The complete book citation in APA format should be at the top of your first page.

#### Rubric for Book Review & Presentation

Name: \_\_\_\_\_

Date: \_\_\_\_\_

| Criteria                                                                 | Exceeds Minimum Requirement (2)                       | Meets Minimum Requirement (1)                                                       | No response / incomplete (0)                                                       |
|--------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Citation complete and in proper format                                   |                                                       |                                                                                     |                                                                                    |
| Adequacy of content summary, description                                 |                                                       |                                                                                     |                                                                                    |
| Quality of critique (plusses-minuses/appreciation and criticism)         |                                                       |                                                                                     |                                                                                    |
| Relevance of suggested uses; comments regarding relevance to education   |                                                       |                                                                                     |                                                                                    |
| Communication: mechanics, organization, clarity of meaning, focus, style | Consistently communicates ideas with support & detail | Communicates most ideas, some missing elements detract from clarity or professional | Communicates sporadically; lack of understanding restricts effective communication |

#### Comments:

#### Paper/Project

You may orient your paper/project toward research or you may focus on some other contribution to the conversation within the profession. Your topic should be one of particular personal interest that also would have value to other teachers or contribute something professionally.

Topics are not limited to those listed below, but could be, for example:

- the implementation and evaluation of particular teaching strategies,
- the creation of one or more instructional materials,
- the use and evaluation of particular instructional materials
- the evaluation of a science program in a school curriculum,
- the design (implementation and evaluation) of a staff development program in a school or district,
- the design (implementation and evaluation) of particular science units,
- the critical review of a current and significant work (book, software, technology, etc.) to the field of science education.

Projects might involve preparing an article for publication or a presentation for a national or state conference (for example, using Inspiration or PowerPoint software). Organizations interested in science education include TSTA, NSTA, CESA, AETS, NARST, NAAEE, NAEYC, ASCD, AERA, SSMA, NCSS, and NCTM. Your papers (or equivalent projects) are presented during the last class meeting, not to exceed 20 minutes per individual or 30 minutes per team.

While projects will vary considerably, the following suggestions apply to a traditional term paper:

1. **TITLE:** Construct a clear title that captures the essence of the project. Your study, for example, may examine *differences between groups or relationships between variables*. You can construct a creative title by providing a catchy first part, followed by a colon, with the second part specifying the content of the paper. The title should be on the cover sheet only, along with your name, the date, and the course. Indicate on the cover when and where the paper will be submitted for publication.
2. **INTRODUCTION:** This is a short part of the paper that establishes the purpose of the project. Introduce the general area, followed by a paragraph that explains the specific focus of your interest. Conclude by pointing out the value or importance of this work.
3. **REVIEW OF THE RELEVANT LITERATURE:** This section is a summary of what is known about the area of your focus. The best articles to review are studies in scholarly, academic journals. Your credibility is enhanced to the degree you draw upon research and scholarship. Use some organizing scheme to review the studies you choose; this will provide helpful transitions between studies and

will show the relationship between each study more clearly. When reviewing studies, write in the past tense, except when discussing the implications of the findings, which should be written in the present tense.

4. **QUESTIONS/HYPOTHESES/CRITICISM:** This section connects the previous research with the present topic of focus, leading to questions, problems, hypotheses, etc., depending upon your purpose.

**5. METHOD:** If a study using human subjects is done, be sure to seek appropriate approval and permissions. Describe the subjects used in the study and your procedures, followed by a section on your **RESULTS** and then a section on **DISCUSSION**. If a study is not done, this section might be **DISCUSSION** instead of **METHOD** and this would be where you comment in some depth about what you have found out, i.e., on the significance and meaning of the findings and to whom it matters. This is where you comment upon the problems or deficiencies you found in the literature (or in your own study). Here, also, you can discuss directions for further study: what should researchers now be interested in finding out? Finally, you should conclude with a clear and succinct paragraph that summarizes your project.

6. **REFERENCES:** Provide full citations using a standard style manual, preferably that of the American Psychological Association (APA). Do not provide citations for sources that were not mentioned in the paper. For citation help, see [www.inspiringonline.com/bentley/citing.html](http://www.inspiringonline.com/bentley/citing.html) or other online guide. Hard copy style guides also are available at most public libraries.

**OTHER SUGGESTIONS:** Write your paper in a scholarly, academic manner. Try to write like other articles in the journal to which you are submitting. Don't use a lot of direct quotations - almost everything can be paraphrased while still giving credit to the author(s). Please use double spacing for all text in the body of the paper. Single spacing may be used for quotes over 5 lines long and for the references. Reread your work and edit errors. Subheadings, like "Introduction" should be centered.

**Project Rubric:** The rubric will vary according to paper/project selected. Rubric criteria are to be negotiated. You are to take the initiative for the first rubric proposal. Student/team must present first draft of a rubric by Class VIII.



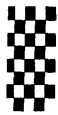
## COLLEGE OF ENGINEERING

### MECHANICAL, AEROSPACE, AND BIOMEDICAL ENGINEERING

#### Engineering Science

Retain ENGINEERING SCIENCE 572.

The course was approved to be dropped Fall 2003. See graduate courses to be dropped (not taught in 4 or more years) – January 30, 2003 Graduate Council Minutes, Page G248.



Feb 19 03 11:39a

MAES dept UTK

(865) 974-5274

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THE UNIVERSITY OF TENNESSEE



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Mechanical, Aerospace and  
Biomedical Engineering Department  
414 Dougherty Engineering Building  
Knoxville, Tennessee 37996-2210  
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To: Graduate Council  
ATTN: Cookie Ely  
Fax: 2606

From: Gary V. Smith  
Graduate Chairman

Date: February 18, 2003

Subject: Retention of ES 572 - Biomedical Fluid Mechanics (3)

I am asking that the material pertaining to ES 572 – Biomedical Fluid Mechanics (3) be retained in the upcoming Graduate Catalog. It was inadvertently dropped by mistake. We will be teaching this course and the need exists for its catalog retention.

Currently listed on page 152 of 2002-2003 Graduate Catalog:

Engineering Science

**ES 572**

**Biomedical Fluid Mechanics (3)**

Application of fluid mechanics theory to fluid flows in living systems. Solutions to differential equations of motion for blood flow in arteries, veins and the microcirculation. Measurement of flow properties of blood and other biological fluids. Analysis of pathological flows, blood flow through arterial stenoses. Study of flow through artificial heart valves and in extracorporeal devices. Prereq: 541. (Same as Biomedical Engineering 572.)

Effective: Fall 2003

## **MEMORANDUM**

**TO:** Graduate Council

**FROM:** Johnie N. Mozingo, Interim Associate Dean for Academic Affairs  
College of Nursing

**DATE:** February 14, 2003

**SUBJECT:** Graduate Curricular Changes - College of Nursing

The attached proposal is a re-submitted item, previously reviewed at the January meeting of the Graduate Council. I hope that the additional supporting documentation and the letter from

Dr. Diane Klein, Director of the Gerontology Minor in the College of Education, Health, and Human Sciences, will provide the information you need to approve this request.

Thank you

JM:jb  
Attachment

## COLLEGE OF NURSING

ADD

**Nursing 400 Aging and Society (3)** An examination of the health and social effects of longevity and the aging process including societal and personal attitudes about old age. Resources, trends, issues, and potentials of aging are explored. Volunteer community service, a service learning component, is required. Open to students in all colleges.

**Effective: Fall 2003**

### SUPPORTING INFORMATION

1. Rationale: Presently Nursing 400 is offered as part of the undergraduate gerontology minor. Graduate students will have additional service and written assignments in the course including a *Gerontology Issues Paper*. Dr. Diane Klein, Director of the Gerontology Minor in the College of Education, Health, and Human Sciences, has requested that the course be available at the graduate level. Having the course available as a graduate level course, available to students in all colleges, strengthens the graduate offerings in the minor.
2. Impact on other academic units: None  
In relation to the possible impact on Sociology 415 Sociology of Aging (which is offered for both undergraduate and graduate credit): Sociology 415 and US 321 Aging and Society (now Nursing 400) have both been offered for years. The courses compliment each other in content and have excellent enrollments. After the retirement of Diana Harris, who had taught Sociology 415, the course has not been regularly offered.

**Effective: Fall 2003**



Department of Health, Safety, and Exercise Science  
1914 Andy Holt Avenue  
Knoxville, TN 37996-2710  
(865) 974-5041  
FAX (865) 974-6439

February 14, 2003

Dr. Sandra McGuire  
Associate Professor  
College of Nursing  
University of Tennessee  
1200 Volunteer Boulevard  
Knoxville, TN 37996

Dear Sandra:

This letter is written in support of the plan to provide the College of Nursing course, N 400: Aging and Society, formerly US 321, as both a graduate and undergraduate course. Our discussion about the freezing of the SOC 415: Sociology of Aging course prompted the need for the Nursing course to be dual level since there is no longer a SOC 415 course, until such time as a faculty in Sociology decides they will cover this area. In the meantime, in order to accommodate offerings for both minors in gerontology and to promote broader perspective for the MPH and PhD students in the Health and Exercise Science programs focusing on gerontology, N 400 needs to be available to graduate students as well as undergraduate students. Your efforts to get this done are greatly appreciated.

Sincerely,

A handwritten signature in cursive script that reads "Diane A. Klein".

Diane Austrin Klein, Ph.D., M.S., M.P.H.  
Assistant Professor - Gerontology  
Coordinator for the Campus-wide Minors in Gerontology  
Department of Health and Exercise Science  
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