

NEW COURSE FORM

1. General Information.				
a.	Submitted by the College of: Education	Today's Date: 04/09/2012		
b.	Department/Division: Science, Technology, Engineering, and Mathematics (STEM) Education			
c.	Contact person name: Margaret Mohr-Schroeder	Email: m.mohr@uky.edu	Phone: 257-3073	
d.	Requested Effective Date: <input checked="" type="checkbox"/> Semester following approval OR <input type="checkbox"/> Specific Term/Year ¹ : _____			
2. Designation and Description of Proposed Course.				
a.	Prefix and Number: SEM 423			
b.	Full Title: Assessment in STEM Education			
c.	Transcript Title (if full title is more than 40 characters): Assessment in STEM Ed			
d.	To be Cross-Listed ² with (Prefix and Number): _____			
e.	Courses must be described by <u>at least one</u> of the meeting patterns below. Include number of actual contact hours ³ for each meeting pattern type.			
	2 Lecture	_____ Laboratory ¹	_____ Recitation	_____ Discussion
	_____ Clinical	_____ Colloquium	_____ Practicum	_____ Research
	_____ Seminar	_____ Studio	_____ Other – Please explain: _____	
f.	Identify a grading system: <input checked="" type="checkbox"/> Letter (A, B, C, etc.) <input type="checkbox"/> Pass/Fail			
g.	Number of credits: 2			
h.	Is this course repeatable for additional credit?			YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
	If YES:	Maximum number of credit hours: _____		
	If YES:	Will this course allow multiple registrations during the same semester?		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
i.	Course Description for Bulletin:	<p><u>The work in this course will help prepare future STEM teachers to create, examine, analyze, and critically utilize a variety of assessments found in K12 education. Specific focus will be given to present day assessment issues and will also include the following interconnected components in relation to assessment: equity (high expectations and strong support for all students); curriculum (coherent, focused, comprehensive, and culturally inclusive); teaching (focus on understanding what students know and need to learn); learning (active construction of new knowledge) and technology (incorporation of technological influences in the teaching-learning process).</u></p>		
j.	Prerequisites, if any: Admission into STEM PLUS Program. Taken concurrently with SEM 435.			
k.	Will this course also be offered through Distance Learning?			YES ⁴ <input checked="" type="checkbox"/> NO <input type="checkbox"/>
l.	Supplementary teaching component, if any: <input type="checkbox"/> Community-Based Experience <input type="checkbox"/> Service Learning <input type="checkbox"/> Both			

¹ Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

² The chair of the cross-listing department must sign off on the Signature Routing Log.

³ In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from SR 5.2.1)

⁴ You must *also* submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.

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3.	Will this course be taught off campus?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
4.	Frequency of Course Offering.		
a.	Course will be offered (check all that apply):	<input checked="" type="checkbox"/> Fall	<input checked="" type="checkbox"/> Spring <input type="checkbox"/> Summer
b.	Will the course be offered every year?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
	If NO, explain: _____		
5.	Are facilities and personnel necessary for the proposed new course available?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
	If NO, explain: _____		
6.	What enrollment (per section per semester) may reasonably be expected?	20	
7.	Anticipated Student Demand.		
a.	Will this course serve students primarily within the degree program?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
b.	Will it be of interest to a significant number of students outside the degree pgm?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
	If YES, explain: Students who add the STEM Education major will also be involved in this course (Colleges of Arts and Sciences and Engineering students).		
8.	Check the category most applicable to this course:		
	<input type="checkbox"/> Traditional – Offered in Corresponding Departments at Universities Elsewhere		
	<input checked="" type="checkbox"/> Relatively New – Now Being Widely Established		
	<input type="checkbox"/> Not Yet Found in Many (or Any) Other Universities		
9.	Course Relationship to Program(s).		
a.	Is this course part of a proposed new program?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
	If YES, name the proposed new program: STEM Education Major		
b.	Will this course be a new requirement ⁵ for ANY program?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
	If YES ⁵ , list affected programs: STEM Education Major and BSEd in STEM Education Program.		
10.	Information to be Placed on Syllabus.		
a.	Is the course 400G or 500?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
	If YES, the <i>differentiation for undergraduate and graduate students must be included</i> in the information required in 10.b . You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See <i>SR 3.1.4.</i>)		
b.	<input checked="" type="checkbox"/> The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from 10.a above) are attached.		

⁵ In order to change a program, a program change form must also be submitted.

NEW COURSE FORM

Signature Routing Log

General Information:

Course Prefix and Number: SEM 423

Proposal Contact Person Name: Margaret Mohr-Schroeder Phone: 257-3073 Email: m.mohr@uky.edu

INSTRUCTIONS:

Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
STEM Education	02/22/2011	Jennifer Wilhelm / 257-1291 / jennifer.wilhelm@uky.edu	
		/ /	
		/ /	
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision ⁶
Undergraduate Council			
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

⁶ Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

Distance Learning Form

This form must accompany every submission of a new/change course form that requests distance learning delivery. This form may be required when changing a course already approved for DL delivery. **All fields are required!**

Introduction/Definition: For the purposes of the Commission on Colleges Southern Association of Colleges and Schools accreditation review, *distance learning* is defined as a formal educational process in which the majority of the instruction (interaction between students and instructors and among students) in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous. A distance learning (DL) course may employ correspondence study, or audio, video, or computer technologies.

A number of specific requirements are listed for DL courses. **The *department* proposing the change in delivery method is responsible for ensuring that the requirements below are satisfied at the individual course level.** It is the responsibility of the instructor to have read and understood the university-level assurances regarding an equivalent experience for students utilizing DL (available at <http://www.uky.edu/USC/New/forms.htm>).

Course Number and Prefix: SEM 423	Date: 04/09/2012
Instructor Name: Margaret Mohr-Schroeder	Instructor Email: m.mohr@uky.edu
Check the method below that best reflects how the majority of course of the course content will be delivered.	
Internet/Web-based <input type="checkbox"/>	Interactive Video <input type="checkbox"/>
Hybrid <input checked="" type="checkbox"/>	

<i>Curriculum and Instruction</i>	
1.	<p>How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?</p> <p>Timely and appropriate interaction will be assured through weekly use of asynchronous and synchronous online discussion groups. Discussions will be facilitated by faculty member. Chats will also be used for weekly interaction. The syllabus does conform to the University Senate Guidelines and includes Distance Learning Considerations and information.</p>
2.	<p>How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.</p> <p>The textbooks, course goals, and assessment of student learning outcomes are identical to a face-to-face class. This hybrid course will offer a mixed method of course presentation. In this class, the only differences are that class-based discussion and reflection is through electronic discussion boards, online chat, blogs, wikis, class materials are available from the download sites, and assignments are distributed and collected online. Students in the course will participate in online and in-class activities, and group work. All students will participate in the same experiences.</p>
3.	<p>How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.</p> <p>The integrity of student work is ensured by requiring the same requirements as a face-to-face class. As a practicum class, course assessments are based on developed projects rather than examinations. The security of student work is facilitated by the security afforded of UK's Blackboard and SharePoint course system.</p>
4.	<p>Will offering this course via DL result in at least 25% or at least 50%* (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?</p> <p>No</p>

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	<p>If yes, which percentage, and which program(s)?</p> <p>*As a general rule, if approval of a course for DL delivery results in 50% or more of a program being delivered through DL, the effective date of the course's DL delivery will be six months from the date of approval.</p>
5.	<p>How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?</p> <p>Course readings will be available online through UK's library sites. Textbooks will be available for purchase online. The instructor will maintain virtual office hours during which time students may participate in online chat sessions, email, or call the instructor for a live conversation. The syllabus includes details for accessing student services on campus for technology support and library support.</p>
<i>Library and Learning Resources</i>	
6.	<p>How do course requirements ensure that students make appropriate use of learning resources?</p> <p>The discussion boards, blogs, wikis, and chats will be tracked for evidence of participation. Readings will be monitored for download. Downloaded readings will be the subjects of discussion boards and chats. Assignments, such as teacher performance assessment and self-reflection assignment, require the use of technology and publication resources.</p>
7.	<p>Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.</p> <p>Technology tools used in the course will be available to students in class and in the College of Education Instructional Technology Center (ITC). Software and peripherals, such as Vernier probes and QX5 digital microscopes and calculators, will be available for check out to students enrolled in the course.</p>
<i>Student Services</i>	
8.	<p>How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Teaching and Academic Support Center (http://www.uky.edu/TASC/index.php) and the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?</p> <p>Students are informed in the actual syllabus as well as in orientation letters emailed to the students.</p>
9.	<p>Will the course be delivered via services available through the Teaching and Academic Support Center?</p> <p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p> <p>If no, explain how students enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.</p>

Distance Learning Form

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10.	<p>Does the syllabus contain all the required components, below? <input checked="" type="checkbox"/> Yes</p> <ul style="list-style-type: none"><input type="checkbox"/> Instructor's <i>virtual</i> office hours, if any.<input type="checkbox"/> The technological requirements for the course.<input type="checkbox"/> Contact information for TASC (http://www.uky.edu/TASC/; 859-257-8272) and Information Technology Customer Service Center (http://www.uky.edu/UKIT/; 859-257-1300).<input type="checkbox"/> Procedure for resolving technical complaints.<input type="checkbox"/> Preferred method for reaching instructor, e.g. email, phone, text message.<input type="checkbox"/> Maximum timeframe for responding to student communications.<input type="checkbox"/> Language pertaining academic accommodations:<ul style="list-style-type: none"><input type="radio"/> "If you have a documented disability that requires academic accommodations in this course, please make your request to the University Disability Resource Center. The Center will require current disability documentation. When accommodations are approved, the Center will provide me with a Letter of Accommodation which details the recommended accommodations. Contact the Disability Resource Center, Jake Karnes, Director at 859-257-2754 or jkarnes@email.uky.edu."<input type="checkbox"/> Information on Distance Learning Library Services (http://www.uky.edu/Libraries/DLLS)<ul style="list-style-type: none"><input type="radio"/> Carla Cantagallo, DL Librarian<input type="radio"/> Local phone number: 859 257-0500, ext. 2171; long-distance phone number: (800) 828-0439 (option #6)<input type="radio"/> Email: dllservice@email.uky.edu<input type="radio"/> DL Interlibrary Loan Service: http://www.uky.edu/Libraries/libpage.php?lweb_id=253&lilib_id=16
11.	<p>I, the instructor of record, have read and understood all of the university-level statements regarding DL.</p> <p>Instructor Name: Margaret Mohr-Schroeder</p> <p>Instructor Signature:</p>

**SEM 423: Assessment in STEM Education
Syllabus**

“Research and Reflection for Learning and Leading”

Instructor:	Dr. Margaret Mohr-Schroeder
Office Location	105C TEB
Phone Number	257.3073
Email	m.mohr@uky.edu
Virtual Office Hours	Arranged individually through email; Telesupervision and Skype access also available
Technological Requirements	Computer with internet access or access to UK computer facilities. Access to digital video recording devices (digital camera, digital video recorder, laptop webcams)
For Technological assistance	Contact TASC at http://www.uky.edu/TASC or call 859.257.8272 Contact Information Technology Customer Service Center http://www.uky.edu/UKIT or 859.257.1300
Technical Complaints	Contact the College of Education Instructional Technology Center at 859.257.7967 or contact Information Technology Customer Service Center http://www.uky.edu/UKIT or 859.257.1300
Preferred method for contacting instructor	Email or Blackboard
Anticipated Response Time	2 days
Information on Distance Learning Library Service	http://www.uky.edu/Libraries/DLLS
DL Librarian	Carla Cantagallo, DL Librarian; local 859.257.0500 ext 2171 Long distance: 800.828.0439, option 6 dllservice@email.uky.edu
DL Interlibrary Loan Service	http://www.uky.edu/Libraries/libpage.php?lweb_ide=253&llib_id16
Course Website:	

Course Description

The work in this course will help prepare future STEM teachers to create, examine, analyze, and critically utilize a variety of assessments found in K12 education. Specific focus will be given to

present day assessment issues and will also include the following interconnected components in relation to assessment: equity (high expectations and strong support for all students); curriculum (coherent, focused, comprehensive, and culturally inclusive); teaching (focus on understanding what students know and need to learn); learning (active construction of new knowledge) and technology (incorporation of technological influences in the teaching-learning process).

The University of Kentucky STEM Education Program, guided by the National Council of Teachers of Mathematics' (NCTM) and the National Science Teacher Association's Standards, provides opportunities for the student to:

1. Connect theory and practice through reflection, teaching, scholarship, and educational research.
2. Design student-focused, authentic learning experiences which incorporate a variety of instructional strategies and consider students of diverse backgrounds and differing perspectives.
3. Examine STEM educational research, critically respond to its implications, and make decisions about appropriate applications.
4. Explore uses of appropriate technological tools to enhance teaching, learning, and assessment.
5. Develop communication skills through multiple forms of discourse and written, oral, and on-line narratives.

Prerequisite:

Admission into the STEM PLUS Program. Concurrent enrollment in SEM 435.

UK College of Education Professional Themes

This course will address the four themes of the conceptual framework for the UK professional education unit: **research, reflection, learning, and leading**. Students will be given the opportunity to review, analyze, discuss, and apply **research** from diverse perspectives in education, including professional scholarship and practitioner inquiry, in order to reflect on their own practices as they study, observe, and practice in P-12 school and university classrooms. **Reflection** will also be integrated into students' learning opportunities through the production of written essays and analyses of observation and teaching experiences to help students take advantage of the analytical and problem-solving skills that comprise critical professional reflection on one's own teaching. This course emphasizes the commitment of the professional education unit to ensure that its graduates move into their professional lives equipped for life-long **learning** as educators who will be active in **leading** colleagues in their schools, districts, and professional organizations. The ultimate goal in addressing these four themes is to produce teacher leaders who work together to improve student learning among diverse populations and improve education in Kentucky and beyond.

Course Learning Targets, Outcomes, and Assessments

This course has been designed to provide students with opportunities to acquire skills, knowledge, conceptual understanding, classroom experience, and practice teaching in their preferred content area(s). By the end of this course, students will have gained the following:

Learning Target/Outcome	Assessment
Identifies and addresses students' misconceptions of content	Diagnostic interviews (Formative)
Values and supports student diversity and addresses individual needs	Field Experience Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) International comparisons (Formative) Diagnostic Interviews (Formative)
Participate in, observe, and reflect upon a variety of education settings.	Student Teaching Experience Reflections (Formative) Diagnostic Interviews (Formative) Analysis of Case Studies (Formative)
Guides students to understand content from various perspectives	Reflections (Formative) Field Experience Analysis of Assessment (Summative) Technology Assessment (Formative)
Uses contextual data to design instruction relevant to students	Field Experience Analysis of Assessment (Summative) Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) International comparisons (Formative) Diagnostic Interviews (Formative)
Plans assessments to guide instruction and measuring learning objectives	Analysis of Assessment (Summative) Field Experience Analysis of Case Studies (Formative) Technology Assessment (Formative)
Plans instructional strategies and activities that facilitate multiple levels of learning	Analysis of Assessment (Summative) Field Experience Analysis of Case Studies (Formative) Technology Assessment (Formative)
Communicates high expectations	Field Experience Analysis of Assessment (Summative) Reflections (Formative)
Establishes a positive learning environment	Field Experience Reflections (Formative)
Implements instruction based on diverse student needs and assessment data	Field Experience Reflections (Formative) Analysis of Assessment (Summative)

	Diagnostic Interviews (Formative)
Uses pre-assessments	Field Experience Analysis of Assessment (Summative) Reflections (Formative) Diagnostic Interviews (Formative) Technology Assessment (Formative)
Uses formative assessments	Field Experience Analysis of Assessment (Summative) Reflections (Formative) Diagnostic Interviews (Formative) Technology Assessment (Formative) Classroom Explorations (Formative)
Uses Summative Assessments	Field Experience Analysis of Assessment (Summative) Reflections (Formative) Technology Assessment (Formative) Classroom Explorations (Formative)
Describes, analyzes, and evaluates student performance	Field Experience Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) International comparisons (Formative) Diagnostic Interviews (Formative)
Communicates learning results to parents	Field Experience Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) International comparisons (Formative) Diagnostic Interviews (Formative) Reflections (Formative) Technology Assessment (Formative)
Allows opportunity for student self-assessment	Field Experience Analysis of Assessment (Summative) Reflections (Formative) Technology Assessment (Formative) Diagnostic Interviews (Formative)
Uses available technology to assess and communicate student learning	Field Experience Reflections (Formative) Analysis of Assessment (Summative) Technology Assessment (Formative) Diagnostic Interviews (Formative) Classroom explorations (Formative)
Demonstrates ethical use of technology	Field Experience

	Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) International comparisons (Formative) Diagnostic Interviews (Formative) Reflections (Formative)
Uses data to reflect on and evaluate student learning	Field Experience Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) International comparisons (Formative) Diagnostic Interviews (Formative) Reflections (Formative)
Uses data to reflect on and evaluate instructional practice	Field Experience Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) Diagnostic Interviews (Formative) Reflections (Formative)
Uses data to reflect on and identify areas for professional growth	Field Experience Analysis of Assessment (Summative) Reflections (Formative) Diagnostic Interviews (Formative) Technology Assessment (Formative)
Analyzes data to evaluate the outcomes of collaborative efforts	Field Experience Analysis of classroom explorations (Formative) Analysis of Case Studies (Formative) Analysis of Assessment (Summative) International comparisons (Formative) Diagnostic Interviews (Formative) Reflections (Formative)
Identifies leadership opportunities that enhance student learning and/or professional environment of the school	Professional Development Reflection (Formative) Analysis of Case Studies (Formative) Diagnostic Interviews (Formative)

Course Delivery

This proposed course is designed as a **hybrid course**. Approximately 30% of the class meetings will occur face to face; the rest will be conducted in an online format. During this time, students will participate in class discussions and present projects. Students will meet face to face at the beginning, middle and end of the semesters. Students are expected to complete reflections, discussions, and finalize their funds of knowledge via an online format. Where an online

discussion is utilized, discussions will take place using a Learning Management System such as Blackboard or NING (www.ning.com) or Second Life.

Senate Bill 1 Initiatives

This course will provide students an opportunity to advance their knowledge and mastery of the “tools” associated with Kentucky education reform, including the Kentucky Core Academic Standards (as they become available), assessment literacy – assessment *for* learning, and the new accountability system as it becomes available. As students carry out projects and complete assignments that involve instructional activities for P-12 students in Kentucky schools, they will address one or more components of the Senate Bill 1 initiatives.

Required Texts

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: NCTM. Or you may use your NCTM membership to access the standards online for free.

National Science Teachers Association Standards Framework for Science Education Standards (as they become available).
Articles Assigned (Available online)

Grades

Grades will be assigned as follows:

90%-100% A; 80%-89% B; 70%-79% C; 60-69% D; <60% E

Completeness and Promptness

Only assignments submitted complete and on time will be considered for full credit. **All assignments must be typed unless otherwise instructed.**

Assignment Format

All assignments will be submitted via **SharePoint/coursewebsite** unless otherwise indicated or stated. It is highly recommended you save all your work electronically and also a hardcopy for your records before turning it in. The following format is required for every assignment submitted. Deviating from the format may result in reduced points, returned paper, or rejection of the assignment completely. All submissions must be typed, in 12-point Times New Roman or Garamond or similar font, with 1” margins all the way around. A **cover page** specifying the assignment, due date, instructor’s name, and student’s name must be included. Please name your files as follows: **lastname.assignment name** (example: schroeder.article2). Assignments are **due by 11pm the day they are due** unless otherwise noted by the instructor.

Late Assignments

Only assignments submitted complete and on time will be considered for full credit. Any assignments turned more than one week late will receive zero points.

Attendance

Attendance of individuals in the class is required, and university rules regarding absences will be followed. Exchange of ideas is essential for the learning that occurs in this class. In most class meetings, students work in pairs and/or in groups. The absence of one individual affects the performance of all persons working in the group. If you are absent, it is each student's responsibility to make up the work and provide evidence that the absence was excused. Without this evidence, the absence will be considered unexcused. Two tardies, whether arriving late or leaving early, equals one unexcused absence. I reserve the right to lower your final grade one letter grade your grade for each unexcused absence.

Excused Absences: S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences:

- 1) serious illness;
- 2) illness or death of family member;
- 3) University-related trips;
- 4) major religious holidays;
- 5) other circumstances you find to be "reasonable cause for nonattendance."

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day for adding a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (257-2754).

In the case of an excused absence, it is the student's responsibility to inform the instructor of the absence, preferably in advance, but no later than one week after it. Opportunities for make-up will be discussed then.

Participation and Professionalism

The STEM PLUS program is a teacher preparation program, and as such expects you to work and to transition into the teaching profession. This entails both mature personal behavior and professional conduct based on the College of Education's Functional Skills and Dispositions (see Student Handbook at <http://education.uky.edu/AcadServ/content/student-handbook-education-programs>). These include 1) communicating appropriately and effectively, 2) demonstrating constructive attitudes, 3) demonstrating the ability to conceptualize key content, 4) interacting appropriately with diverse groups in educational settings (including colleagues and students), and 5) demonstrating a commitment to professional ethics and behavior.

You are expected to be on-time, present at classes and at all school observations related to this course and in the program overall. If you must be absent for a legitimate reason it is **your responsibility** to contact instructors/supervisors and make up any missing class work. Since class work is often in groups or pairs, the absence of one individual affects the total class experience. You must provide evidence that your absence is excused. Two tardies equals one unexcused absence. S.R. 5.2.4.2. defines acceptable reasons for excused absences as "serious illness, illness or death of a family member, university related trips, major religious holidays or

other circumstances you find to be reasonable cause for nonattendance.” Decisions on the acceptance of late work are at the discretion of the instructor.

You are expected to be an active participant in this class, and to demonstrate participation in a variety of ways in accordance with a student seeking to become a professional teacher. Participation may include: Contributing in discussions, asking constructive questions or responding to peers or instructor, demonstrating active listening (taking notes, paying attention, etc.), and communicating with the instructor via office meetings and/or email. Attendance, participation, and professionalism will be assessed holistically based on the above criteria, and will be used to determine the outcome of borderline grades. In cases of extreme or frequent misconduct, the instructor reserves the right to dismiss a student from class and notify the department and college for potential disciplinary action.

In relation to participation and expectations for student behavior, cell phones need to be kept off during class meetings. If you are on call for emergency reasons please alert the instructor. Note taking and in-class work via laptop computers is acceptable. Social networking, writing e-mails, texting, or reading sources unrelated to class content is unacceptable.

Students who fail to attend class on a regular basis, participate as expected, and/or conduct themselves professionally or ethically will be required to meet with the instructor to set improvement goals, and may face failure or expulsion based on due process policies set by the College of Education and Teacher Education Preparation program.

You are encouraged to communicate regularly with the instructor so that you are aware of your standing. This may be accomplished via face-face meetings during office hours and via email.

Field Experience

The schools you will be working and learning in count on you to behave professionally and ethically. If an emergency prevents or delays your attendance at school, you must notify the school, all cooperating teachers, and Dr. Schroeder or Dr. Bouwma-Gearhart. Absences must be made up before the end of the fall semester. Failure to make up absences will result in an incomplete grade for the course.

Students with Special Needs

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protections for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides a reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please notify your instructor and contact the Disability Resource Center (Mr. Jake Karnes, jkarnes@uky.edu) 257-2754, room 2 Alumni Gym.

The course will be conducted with openness and respect to all individuals' points of view and experience. The activities and discussions will not tolerate discrimination or prejudice toward any person or group's religion, ethnicity, disability, gender, or sexual orientation.

Ethics Statement

This course and its participants will not tolerate discrimination, violence, or vandalism. STEM Education is an open and affirming department for all people, including those who are subjected to racial profiling, hate crimes, heterosexism, and violence. We insist that appropriate action be taken against those who perpetrate discrimination, violence, or vandalism. The University of Kentucky is an Affirmative Action and Equal Opportunity institution and affirms its dedication to non-discrimination on the basis of race, color, religion, gender, age, sexual orientation, domestic partner status, national origin, or disability in employment, programs, and services. Our commitment to non-discrimination and affirmation action embraces the entire university community including faculty, staff, and students.

All students are expected to conduct themselves in an appropriate and ethical manner during their UK classes and related field placements, as befitting students, future teachers, and ambassadors for the University of Kentucky. Any unethical behavior in class or during your field placements may result in failure for the course and/or expulsion from the STEM PLUS program, determined on a case-by-case basis. Faculty will follow all university due process procedures in cases of academic or ethical misconduct. Please consult Dr. Schroeder or Dr. Bouwma-Gearhart if you have questions regarding this requirement.

Statement on Plagiarism

All materials generated for this class (which may include but are not limited to syllabi and in-class materials) are copyrighted. You do not have the right to copy such materials unless the professor or assistant expressly grants permission. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have permission of that person. Plagiarism is one of the worst academic violations, for the plagiarist destroys trust among others.

Commitment to Diversity & Equity

The STEM PLUS Program is committed to: making diversity central to policies, decisions, and practices; evaluating progress toward diversity in the program; disseminating results widely; and using these results to strengthen diversity for the Commonwealth.

Equitable access to high quality mathematics instruction in Kentucky's secondary schools is directly and indirectly affected by UK's STEM PLUS program's beliefs in and support for social diversity in schools. Moreover, the Commonwealth is directly affected by the ability of its youth to acquire high levels of skill in mathematics that can then be used by them as citizens to enhance their communities and participate in the state's ongoing progress and prosperity in local, regional, national, and global contexts. Therefore, it is essential for our teacher candidates to understand issues related to social diversity and make a commitment to value diversity as they engaged in teaching, research, reflection, learning, and leadership. By valuing diversity, our program is committed to enabling and empowering all people in educational contexts regardless of their race, ethnicity, gender, social class, sexual orientation, domestic partner status, and so forth.

Students who speak a first language other than English or have related cultural differences must not face special barriers to learning mathematics, science, and computer science. Every student's cultural heritage should be accepted and celebrated for the diversity that it brings to the learning environment. Expanded opportunities should be available to English language learners (ELL students) who need them to develop mathematical and scientific understanding and proficiency. Mathematics, Science, and Computer Science teachers should have knowledge of content and pedagogy that support ELL students, including an understanding of the role of the first language. (NCTM, 2008)

Excellence in mathematics, science, and computer science education rests on equity—high expectations, respect, understanding, and strong support for all students. Policies, practices, attitudes, and beliefs related to mathematics teaching and learning must be assessed continually to ensure that all students have equal access to the resources with the greatest potential to promote learning. A culture of equity maximizes the learning potential of all students. (NCTM, 2008)

Commitment to Addressing the Achievement Gap

The UK STEM PLUS Program aligns itself with the positions of the National Council of Teachers of Mathematics regarding cultural and linguistic diversity in STEM education. The program seeks to underscore that cultural and linguistic diversity should be treated as integral components of STEM education, and that the failure to accommodate such diversity in curriculum and instruction lies at the heart of disparities in mathematics achievement between Caucasian and Minority racial populations—a phenomenon popularly referred to as “the achievement gap.” The NCTM (2005) offers the following belief statement that underscores our program’s commitment to diversity in education:

Every student should have equitable and optimal opportunities to learn mathematics free from bias—intentional or unintentional—based on race, gender, socioeconomic status, or language. In order to close the achievement gap, all students need the opportunity to learn challenging mathematics from a well-qualified teacher who will make connections to the background, needs, and cultures of all learners. (¶ 2)

Commitment to Technology

The Initial Preparation Certification Program in STEM Education is committed to teaching candidates so they use technology as a personal and professional tool. Our program is guided by NCATE standards and EPSB Kentucky Teacher Standards as they relate to technology. Candidates are required to use technology for a majority of their classes. Candidates use technology for class assignments, lesson plan design and preparation, class presentations, record keeping, and data analysis. Candidates are required to successfully complete course work focusing on using technology. Our candidates are required to communicate via electronic mail, use list serves, access the Internet and online databases, and use digital texts and modes for research projects and presentations. Our candidates use Microsoft Word, Excel, Access, and PowerPoint. They are given multiple opportunities during student teaching to videotape their

teaching for use in self-analysis toward professional development. Our program offers candidates access to “smart” classrooms and technology labs in order to further facilitate their use of technology.

In addition to its alignment with NCATE standards, EPSB themes, and UK College of Education Technology Standards, the UK STEM PLUS Program aligns itself with the position of the National Council of Teachers of Mathematics regarding the use of technology and media in STEM education. NCTM’s (2008) statements underscore our program’s commitment to technology as follows:

Technology is an essential tool for learning mathematics in the 21st century, and all schools must ensure that all their students have access to technology. Effective teachers maximize the potential of technology to develop students’ understanding, stimulate their interest, and increase their proficiency in mathematics. When technology is used strategically, it can provide access to mathematics for all students. ...

Programs in teacher education and professional development must continually update practitioners’ knowledge of technology and its classroom applications. Such programs should include the development of mathematics lessons that take advantage of technology-rich environments and the integration of technology in day-to-day instruction, instilling an appreciation for the power of technological tools and their potential impact on students’ learning and use of mathematics. All teachers must remain open to learning new technologies, implementing them effectively in a coherent and balanced instructional program. These tools, including those used specifically for teaching and learning mathematics, not only complement mathematics teaching and learning but also prepare all students for their future lives, which technology will influence every day.

Course Components

Note: course readings and assignments have been selected and arranged in compliance with policies set forth by Senate Bill 1 (March 2009), the Kentucky Education Professional Standards Board (EPSB) themes of Diversity, Assessment, Literacy, and Closing the Achievement Gap, and the National Council for the Accreditation of Teacher Education Standards.

Task	Task Description	Standards Alignment (Kentucky Teaching Standards)
Evaluate current issues and research related to assessment.	Students will write critical and reflective responses to primary readings dealing with the latest research on assessment.	Standard 1

Explore ways to develop appropriate assessment strategies for students of diverse backgrounds.	Students will write an analysis of classroom explorations; participate in role play, simulations, or cooperative learning tasks.	Standard 5
Analyze classroom applications of assessment.	Students will write an analysis of case studies and/or video footage.	Standard 5
Analysis of Assessment	Assessment is a vital part of teaching. Analyzing and being able to interpret and apply assessment results is even more important! In this assignment you will design a pre- and post-assessment (entrance and exit slips are most commonly used) for one unit. You will analyze the results and write them up. This assignment will follow the KTIP format.	Standard 2
Design assessment pieces (either formative or summative) that incorporate technology.	Students will design several forms of assessment (formative or summative) that utilizes existing technologies (i.e. applets, diagnostic software) to provide immediate learner feedback.	Standard 6
Compare US students STEM understanding with other countries.	Students will conduct a comparative analysis of Kentucky and US students' science and mathematics achievement with those students from other countries.	Standard 1
Conduct diagnostic interviews	Students will explore children's thinking and assess their understanding (diagnosing misconceptions) by conducting a clinical interview. This interview will be videotaped, analyzed, and presented to peers in class.	Standard 1

THE INSTRUCTOR RESERVES THE RIGHT TO CHANGE ANY PART OF THIS SYLLABUS DURING ANYTIME IN THE SEMESTER. STUDENTS WILL BE ADEQUATELY NOTIFIED WHENEVER CHANGES OCCUR.

Course Schedule and Outline

Class Number and Date	Topics, Agenda, and Readings
Class 1	<p><i>Welcome!</i></p> <ul style="list-style-type: none"> • Go over Syllabus • Class Opener • Hopes, fears, orientations • Requirements of course during student teaching
Class 2	<i>Observation Skills</i>
Class 3	<p><i>Current Issues in Assessment</i></p> <p>Suggested readings:</p> <p>Black, P., & William, D. (1998, October). Inside the black box: Raising standards through classroom assessment. <i>Phi Delta Kappan</i>, 140-148.</p> <p>Bryant, D. & Driscoll, M. (1998). <i>Exploring classroom assessment in mathematics: A guide for professional development</i>. Reston, VA: National Council of Teachers of Mathematics.</p>
Class 4	<p><i>Achievement and Opportunity Gaps in STEM</i></p> <p>Suggested readings:</p> <p>Ripley, A. (2005, March 7). Who says a woman can't be Einstein? <i>Newsweek</i>, 51-60.</p> <p>Rodriguez, A.J., & Kitchen, R.S. (Eds.) (2005). <i>Preparing mathematics and science teachers for diverse classrooms: Promising strategies for transformative pedagogy</i>. Mahwah, NJ: Lawrence Erlbaum Associates.</p> <p>Tobias, S. (1990). <i>They're not dumb. They're different</i>. Tucson, AZ: Research Corporation.</p>
Class 5	<p><i>Assessment Standards</i></p> <p>Suggested readings:</p> <p>Linn, R.L., Baker, E.L., Dunbar, S.B. (1991, November). Complex, performance-based assessment: Expectations and validation criteria. <i>Educational Researcher</i>, 15-21.</p> <p>National Research Council. (1996). <i>National Science Education Standards</i>. Washington, D.C.: National Academy Press.</p> <p>Next Generation Science Standards (as they become available).</p> <p>Common Core State Standards for Mathematics (2011) and its Appendix A. National Council of Teachers of Mathematics. (2000). <i>Principles and Standards for School Mathematics</i>. Reston, VA: National Council of Teachers of Mathematics.</p>
Class 6	<p><i>Exploring Student Thinking</i></p> <p>Suggested readings:</p> <p>Heman, J. L., Aschbacher, P. R., & Winters, L. (1992). <i>A practical guide to alternative assessment</i>. Alexandria, VA: Association of Supervision and Curriculum Development.</p>

<p>Class 7</p>	<p><i>Essential Elements of Assessment</i> Suggested readings: Enger, S. K. & Yager, R. E. (2001). <i>Assessing student understanding in science: A standards-based K-12 handbook</i>. Thousand Oaks, CA: Corwin Press.</p>
<p>Class 8</p>	<p><i>Knowing, Not Knowing, and Children's Understanding</i> Suggested readings: Bransford, J.; Brown, A.L.; & Cocking, R.R. (2000). <i>How people learn: Brain, mind, experience, and school</i>, Expanded Edition. Arlington: NSTA Press. Bush, W. S. (Ed.) (2000). <i>Mathematics assessment: Cases and discussion questions for grades 6-12</i>. Reston, VA: National Council of Teachers of Mathematics.</p>
<p>Class 9</p>	<p><i>Assessment for Learning</i> Suggested readings: Dodge, D., Heroman, C., Charles, J., & Malorca, J. (2004). Beyond outcomes: how ongoing assessment supports children's learning and leads to meaningful curriculum. <i>Young Children</i>, 59 (1): 20-28. Harcourt, M. (2003). <i>Great expectations: Creating a welcoming classroom environment for ALL students</i>. University of Hawai'i – Manoa.</p>
<p>Class 10</p>	<p><i>Assessment for Learning</i> Suggested readings: Campbell, B. & Fulton, L. (2003). <i>Science notebooks: Writing about inquiry</i>. Arlington: NSTA Press. Gutstein, E. (2006). <i>Reading and writing the world of mathematics: Toward a pedagogy for social justice</i>. New York, NY: Routledge.</p>
<p>Class 11</p>	<p><i>Designing Assessments</i> Suggested readings: Hammerman, E. (2005). Linking classroom instruction and assessment to standardized testing. <i>Science Scope</i>, (Jan. 2005):26-32. Wiggins, G. (1998). <i>Educative assessment: Designing assessments to inform and improve student performance</i>. San Francisco, CA: John Wiley & Sons.</p>
<p>Class 12</p>	<p><i>Diagnostic Interviews and Effective Questioning</i> Suggested readings: Huinker, D. (1993). Interviews: a window to students' conceptual knowledge of the operations. In N.L. Webb (Ed.), <i>Assessment in the mathematics classroom</i> (pp. 80-86). Moyer, P.S., & Milewicz, E. (2002). Learning to question: categories of questioning used by preservice teachers during diagnostic mathematics interviews. <i>Journal of Mathematics Teacher Education</i>, 5 (4): 293-315.</p>
<p>Class 13</p>	<p><i>Analysis of Assessments</i> Suggested readings: Hein, G. E. & Price, S. (1994). <i>Active assessment for active science: A guide for elementary school teachers</i>. Portsmouth, NH: Heinemann.</p>

<p>Class 14</p>	<p><i>Curriculum Issues and Grading</i> Suggested readings: Wiggins, G. & McTighe, J. (2001). <i>Understanding by design</i>. Prentice-Hall, Inc.: Upper Saddle River, New Jersey. Tate, W.F. (2005). <i>Access and opportunities to learn: Engineering mathematical progress in your school</i>. Greensboro, NC: SERVE Lewin, K.M. (2000). <i>Mapping science education policy in developing countries</i>. Washington, D.C.: The World Bank</p>
<p>Class 15</p>	<p><i>Changing the System</i> Suggested readings: Duckworth, E. (1996). <i>The having of wonderful ideas and other essays on teaching and learning</i>. New York, NY: Teachers College Press. Fullan, M. G. (1993). Why teachers must become change agents. <i>Educational Leadership</i>, 50 (6), pp. 12-18. Rodriguez, A.J. (2004). <i>Turning despondency into hope: Charting new paths to improve students' achievement and participation in science education</i>. Greensboro, NC: SERVE.</p>
<p>Class 16</p>	<p><i>Final – Analysis of Assessment Due</i></p>

THIS SCHEDULE IS SUBJECT TO CHANGE WITH PRIOR COMMUNICATION TO STUDENTS.