NEW COURSE FORM

1.	**General Information.**			

a.	Submitted by the College of:	Education	Today's Date:	02/22/2011

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:	☒ Semester following approval OR ☐ Specific Term/Year[1] : _____

2.	**Designation and Description of Proposed Course.**

a.	Prefix and Number:	SEM 110

b.	Full Title:	Introduction to STEM Education

c.	Transcript Title (if full title is more than 40 characters):	Intro to STEM Education

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.

1 Lecture	_____ Laboratory[1]	_____ Recitation	_____ Discussion	_____ Indep. Study
_____ Clinical	_____ Colloquium	3 Practicum	_____ Research	_____ Residency
_____ Seminar	_____ Studio	_____ Other – Please explain: _____		

f.	Identify a grading system:	☒ Letter (A, B, C, etc.) ☐ Pass/Fail

g.	Number of credits:	2

h.	Is this course repeatable for additional credit?	YES ☐	NO ☒
	If YES: Maximum number of credit hours: _____		
	If YES: Will this course allow multiple registrations during the same semester?	YES ☐	NO ☒

i.	Course Description for Bulletin:	Through campus and school-based experiences, students will learn how to engage adolescents in learning mathematics, science, computer science, and engineering. This course will introduce the foundations of STEM Education, learning environments, curriculum and instruction, standards and assessment, as well as contemporary issues related to the field. The roles, responsibilities and daily life of teachers, schools and students will be examined. This course includes 30 hours of experience in the field.

j.	Prerequisites, if any:	_____

k.	Will this course also be offered through Distance Learning?	YES[4] ☒ NO ☐

l.	Supplementary teaching component, if any:	☐ Community-Based Experience ☐ Service Learning ☐ Both

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[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.

NEW COURSE FORM

3.	**Will this course be taught off campus?**			YES ☐		NO ☒

4.	**Frequency of Course Offering.**		

a.	Course will be offered (check all that apply):	☒ Fall	☒ Spring	☐ Summer	
b.	Will the course be offered every year?		YES ☒		NO ☐
	If NO, explain:	_____			

5.	**Are facilities and personnel necessary for the proposed new course available?**	YES ☒		NO ☐
	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 ☒		NO ☐
b.	Will it be of interest to a significant number of students outside the degree pgm?	YES ☒		NO ☐
	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:**
	☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere
	☐ Relatively New – Now Being Widely Established
	☒ 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 ☒		NO ☐
	If YES, name the proposed new program:	STEM Education Major		
b.	Will this course be a new requirement[5] for ANY program?	YES ☒		NO ☐
	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 ☐		NO ☒
	If YES, the *differentiation for undergraduate and graduate students must be included* 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 *SR 3.1.4*.)			
b.	☒	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.

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Signature Routing Log

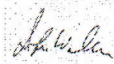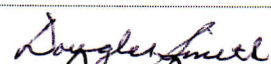**General Information:**

Course Prefix and Number: SEM 110

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	*signature*
C+C Comm	3/28/11	Doug Smith / 7-1824 / desmit@uky.edu	*Douglas Smith*
College of ED	4/18/11	Steve Parker / 7-5443 / spark0@uky.edu	*signature*
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision[6]
Undergraduate Council	11/8/2011	Sharon Gill	
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

The Board of Trustees approved the Department of Science, Technology, Engineering, and Mathematics (STEM) Education on February 22, 2011. The department will fiscally begin on July 1, 2011.

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[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 <u>every</u> 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!**

<u>Introduction/Definition</u>: 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).
Error! Hyperlink reference not valid.

Course Number and Prefix: SEM 110	Date: 2/22/2011
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 ☐　　　Interactive Video ☐　　　Hybrid ☒

	Curriculum and Instruction
1.	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?
	Timely and appropriate interaction will be assured through weekly use of asynchronous and synchronous online discussion groups. Discussions will be faciliated 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.
2.	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.
	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 avialable 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.
3.	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.
	The integrity of student work is ensured by requiring the same requirements as a face-to-face class. As a pracitcum class, course assessments are based on developed projects rather than examinations. The security of student work is facilitated by the security affordanced of UK's Blackboard and SharePoint course system.
4.	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? No

Abbreviations: TASC = Teaching and Academic Support Center　　DL = distance learning　　DLP = Distance Learning Programs

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	If yes, which percentage, and which program(s)? *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.
5.	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? Course readings will be avialable 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 suppport and library support.
Library and Learning Resources	
6.	How do course requirements ensure that students make appropriate use of learning resources? 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.
7.	Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program. 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.
Student Services	
8.	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/)? Students are informed in the actual syllabus as well as in orientation letters emailed to the students.
9.	Will the course be delivered via services available through the Teaching and Academic Support Center? Yes ☒ No ☐ 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.

Distance Learning Form

This form must accompany <u>every</u> 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!**

10.	Does the syllabus contain all the required components, below? ☒ Yes
	☐ Instructor's *virtual* office hours, if any.
	☐ The technological requirements for the course.
	☐ 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).
	☐ Procedure for resolving technical complaints.
	☐ Preferred method for reaching instructor, e.g. email, phone, text message.
	☐ Maximum timeframe for responding to student communications.
	☐ Language pertaining academic accommodations:
	o "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."
	☐ Information on Distance Learning Library Services (http://www.uky.edu/Libraries/DLLS)
	o Carla Cantagallo, DL Librarian
	o Local phone number: 859 257-0500, ext. 2171; long-distance phone number: (800) 828-0439 (option #6)
	o Email: dllservice@email.uky.edu
	o DL Interlibrary Loan Service: http://www.uky.edu/Libraries/libpage.php?lweb_id=253&llib_id=16
11.	I, the instructor of record, have read and understood all of the university-level statements regarding DL.
	Instructor Name: Margaret Mohr-Schroeder Instructor Signature:

Margaret Mohr-Schroeder

SEM 110: Introduction to STEM Education
Syllabus

"Research and Reflection for Learning and Leading"

Instructor:	Dr. Margaret Mohr-Schroeder or Dr. Jana Bouwma-Gearhart
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

Through campus and school-based experiences, students will learn how to engage adolescents in learning mathematics, science, computer science, and engineering. This course will introduce the foundations of STEM Education, learning environments, curriculum and instruction, standards and assessment, as well as contemporary issues related to the field. The roles, responsibilities and daily life of teachers, schools and students will be examined. This course includes 30 hours of experience in the field.

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
Describe the teaching and learning of adolescent American education settings in STEM Education. • **Become aware of the roles, responsibilities, and daily experiences of teachers** • **Become aware of foundations of STEM Education** • **Become aware of significant contemporary issues**	Funds of Knowledge (Summative)
Self-assess dispositions and standards related to effective teaching and develop personal goals for growth • **Characteristics of Highly Effective Mathematics Teaching (http://www.education.ky.gov/KDE/Instructional+Resources/Highly+Effective+Teaching+and+Learning/Characteristics+of+Highly+Effective+Mathematics+Teaching+and+Learning.htm)** • **Kentucky Teacher (Initial) Standards**	Self-assessment (Formative)

(http://www.kyepsb.net/documents/EduPrep/Kentuckyteacherstandards.doc) • **Appropriate content area standards**	
Participate in, observe, and reflect upon a variety of education settings.	30 hours of field experience (Formative) Reflections (Formative)
A basic understanding of curriculum and assessment	In class activities (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).

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)

Recommended Texts

Donovan, M. S., & Bransford, J. D. (eds.). (2005). *How students learn.* Washington, DC: The National Academies Press.
Wong, H. K., & Wong, R. T. (2001). *The first days of school: How to be an effective teacher*. Harry K. Wong Publications.

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 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](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 or 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.

Legal Action
STEM PLUS students charged with violations of criminal law will be suspended immediately from the Teacher Education Program and/or field experiences until the case is settled. Students are responsible for reporting such charges to the Program Faculty Chair.

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.

- ✓ Due throughout the semester:
    - o **Homework problems:** Write-ups of work done in class and home related to curriculum and assessment issues in today's classrooms. All homework problems should be typed and submitted properly unless otherwise noted.
    - o **Participation:** Each class period all students are required to actively participate in class (see above for participation guidelines). Failure to participate will result in a 5% deduction from your overall, final grade.
    - **(KTS-I 1, 2-5, 7, 8; NCATE/NCTM 1-15; Diversity, Assessment, Literacy/Reading, Closing the Achievement Gap)**

- ✓ **Funds of Knowledge Digital Reflection Project**
    One of our primary themes is that teachers must help students learn "academic literacy" by drawing on the "funds of knowledge" they bring with them from outside of school. Teachers must use that assessment data to make school work relevant and easier for students to understand. Each subject area represents a unique discipline with its own vocabulary, its own concepts, and its own ways of communicating knowledge and understanding, and it's our job to teach high school students how these disciplines work.
    Using a digital camera, collect data about students' funds of knowledge (home, community, school, culture, informal activities, formal activities, and popular cultures). Develop a series of images that represent the sources of knowledge your students have access to, and create a photo-essay that documents your understanding of those funds as they relate to your subject area. Use the following essential questions to guide you:
    - o *What funds of knowledge do students have access to in their daily lives?*

- *What kinds of activities and skills must students be able to engage in to be successful in school (including non-academic aspects)?*
- *What kinds of work do students and their families do? What do they learn in this work?*
- *What beliefs, practices, and knowledge do students learn in their homes and with their families (i.e., family life, religion, diet, economics, ethnic practices)?*
- *What roles do students' cultures play in their daily lives, and what sorts of knowledge do they gain from those cultures?*
- *What community practices seem prevalent in your students' lives, and what do they learn from community interactions?*
- *What informal activities do students engage in, and what might they learn from these ("hanging out," "messing around")? What might they learn from more formal activities (playing sports, participating in art and theater, other more organized hobbies outside of school)?*
- *What kinds of popular culture do they use every day, and what do they learn from doing so (film, television, radio, Internet, magazines, music, books, etc.)?*
  - *What can you use to help students make the most of ALL their funds of knowledge so they can be successful in your subject area?*
  - *What does learning and teaching (in your subject area) mean in the world today?*
  - *What does learning look like in school and life?*

Take pictures of the school and community environments that will help you and your audience understand where your students come from, what they know, do, and value most in their daily lives, and how their environments might shape their behaviors and engagement at school. The more pics you take, the more you will have to work with. You do not have to use every picture that you take in your digital presentation; rather, carefully choose images that help you create a portrait of your students, their knowledge, and potential teaching resources. Save all your images in an electronic folder (and create a backup copy!). You may not take direct face shots or create any photos where students can be identified.

Using your image bank, document your SEM 110 experiences as they relate specifically to your subject area teaching. Consider prospective students and new teachers at your school as your audience. Create a 5-10 minute multimedia presentation using a program such as Photostory, MovieMaker, PowerPoint, or a similar application that allows you to arrange images to clearly tell a story about your students' knowledge base.
Your responsibility may be as "creative" or straightforward as you feel is appropriate based on what you wish to say about your learning. Avoid going for the easy joke or the tear-jerker. Say something real, and if humor and sentimentality are appropriate, use them.

You may utilize voice recordings to narrate your presentation, as well as text, music, color, and other elements if they will enhance the messages you wish to send to your audience. These are not required. Do not feel you have to use every bell and whistle your software has to offer, but DO create a multi-modal text that strategically communicates a thoughtful and engaging message.
(KTS 2,3,5,6,7,9; NCATE/NCTM 1-16; Diversity, Assessment, Literacy/Reading, Closing the Achievement Gap)

✓ **Field Experiences:** You will be expected to complete a minimum of 30 hours of field experience in an adolescent classroom in your content area(s) of interest. This will be completed between XXX and XXX. The placement will be made for you at the beginning of the semester. It is your responsibility to communicate with your supervising teacher the expectations and needs of your placement. You are not to just observe in the classroom. Rather, you will be given a specific task to focus on each week. Below is a list of core activities you should focus on during your field experience:
1. Observe classroom teaching.
    a. Students should regularly spend time observing classrooms in action. They have been prepared to conduct observations in a focused manner, including observing and analyzing teacher actions and behaviors, and observing/interpreting student responses, behaviors, and learning. Focused observation is a key activity in learning to teach at this phase of their development.
2. Discuss classroom episodes with the cooperating teacher.
    a. Learn about rationales, teacher decision-making, classroom management techniques, instructional methods, etc., by talking with the cooperating teacher. Discussions may be as brief as 5 minutes.
3. Analyze the cooperating teacher's lesson plans.
    a. When possible, please share samples of your lesson and unit planning with the cohort student so s/he can use them as models for his/her own planning.
    b. It is also valuable for students to study and review building and district level curriculum guides. Please give students access to any curriculum documents available: scope/sequence guides, etc.
4. Co-plan lessons with the cooperating teacher when possible/appropriate.
5. Co-teach lessons with the cooperating teacher when possible.
6. Teach mini-lessons on skills and strategies related to a lesson or unit, with the supervision of the cooperating teacher.
7. Lead/coach selected cooperative/small learning groups.
8. Assist with class discussions and activities.
9. Lead class discussions with the supervision of the cooperating teacher.
10. Assist students with seatwork by circulating during class.
11. Tutor students, including both struggling students and students in need of enrichment.
12. Explain assignments to the class.
13. Develop assessment rubrics with cooperating teacher supervision.

14. Supervise classroom routines.
15. Use/assist with technology in the classroom.
16. Review and prepare instructional materials.

✓ **Classroom Reflections:** After completing a classroom observation, you will reflect on the observation. These will be in the form of a blog posted to the secure course website. The focus of your reflection should be the observation focus of the week although you may reflect on additional experiences as you see fit. You will be expected to comment on at least one other blog/reflection each week in order to help facilitate an online discussion.

✓ **Self-Assessment:** You will complete a self-assessment of your dispositions and knowledge of standards as related to teacher education. You will evaluate your strengths and weaknesses and create dispositional goals. You will then reflect on your progress towards these goals and complete an online dispositions self-assessment at the end of the semester.

Professional Development Pass/Fail Components
There are aspects of this course that you will be expected to complete prior to receiving your grade for this course. *Failure to satisfactorily complete any **one** of these components will result in the lowering of your final grade by 1 letter grades.*

• **Professional Development:** Learning to be a STEM education teacher cannot be accomplished within one semester; it is an ongoing, lifelong endeavor. Throughout the semester, each student is expected to demonstrate evidence of willingness to become a lifelong learner. Several opportunities are available, including (but not limited to): (1) joining and attending BBCTM or UK NSTA Meetings, (2) joining the NCTM or NSTA through a regular student membership, (4) observing secondary mathematics, science, and/or computer science teachers outside of the assigned placement, (5) reading a book or series of articles on STEM education other than those required for class, (6) conducting Web searches of teaching resources, compiling, and submitting a bibliography, (7) attending a campus technology training session, (8) attending conferences and so on. For this course you are required to **attend two professional development session**s as deemed above or other opportunities presented by the Instructor. You will be required to turn in a 2-3 page reflection on the PD overall and how it helped you grow as a future secondary mathematics teacher. **(KTS-I 6-10; NCATE/NCTM 7; Diversity, Assessment, Closing the Achievement Gap)**

✓ **Department Meeting:** You will need to attend at least one department meeting at your placement school. Write a summary and reflection about this department meeting. **(KTS-I 6-10; NCATE/NCTM 7; Diversity, Assessment, Closing the Achievement Gap)**

BREAKDOWN OF POINTS FOR COURSE

Assignment	Points
Funds of Knowledge	100
Field Experience Hours	P/F – Will receive an "I" until the hours are completed. An "I" converts to an "E" if not completed within one calendar year.
Reflections	25
Self Assessment	50
In Class Work	10 points each
Participation	Could result in 5% overall deduction
Professional Development	Failure to complete will result in one letter grade lower
Department Meeting	Failure to complete will result in one letter grade lower
TOTAL POINTS	**200**

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	*Welcome!* • Go over Syllabus • Class Opener • Hopes, fears, orientations • Feiman-Nemser, S., & Buchman, M. (1985). Pitfalls of experience in teacher preparation. *Teachers College Record*, 87(1), pp. 53-65. • Requirements and scheduling of field experience hours
Class 2	*Observation Skills* • Lortie, D. (1975). Chapter 2, Recruitment and re-affirmation. *Schoolteacher: A sociological study*. Chicago: University of Chicago Press, pp. 25-54. • How to observe and reflect
Class 3	*Dispositions* • Lortie, D. (1975). Chapter 3, The limits of socialization. *Schoolteacher: A sociological study*. Chicago: University of Chicago Press, pp. 55-81. • Complete self-assessment
Class 4	*The Teaching Profession* • Is teaching a profession? • Teacher Organizations • Educational Reform and Teacher Empowerment
Class 5	*Culture, Socialization, and Education* • Funds of Knowledge Assignment • Sex Roles and Sex Differences • Adolescents and Youth Problems • Agents of Socialization
Class 6	*Social Class, Race, and School Achievement* • Social Class and success in school • Race, ethnicity, and school success • Reasons for low achievement • Do schools equalize opportunity?
Class 7	*Equal Educational Opportunity* • Multicultural Education • Education for students with disabilities • Males vs. Females in STEM Education • Who is the disadvantaged student? • At risk students and Dropouts • Algebra as the gatekeeper?
Class 8	*Purposes of STEM Education* • Read *A Nation at Risk* and *Rising above the Gathering Storm* • Establishing goals and objectives • The call for excellence in STEM

Class 9	*Curriculum and Instruction* • Curriculum Organization • Issues in Curriculum Development • Instructional Approaches • Emerging Curriculum Trends
Class 10	*Assessment* • Assessment Literacy • Assessment *for* Learning
Class 11	*International Education* • Read recent *TIMSS* Study • Commonalities in Educational Systems • Differences in Educational Systems and Outcomes • Mathematics and Science learning in International Settings
Class 12	*Characteristics of Highly Effective Teaching and Learning* • Effective Teaching and Instruction • Effective Schools
Class 13	*Funds of Knowledge*
Class 14	*Funds of Knowledge* wrap-up and reflection
Class 15	*Funds of Knowledge* wrap-up and reflection • Next steps in STEM PLUS Program
Class 16	*Final Exam – online Self-Assessment*

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