REQUEST FOR NEW COURSE

1.	**General Information.**	
a.	Submitted by the College of: Education	Today's Date: 11.06.09
b.	Department/Division: Curriculum & Instruction	

c.	Contact person name: Jana Bouwma-Gearhart	Email: jana.bouwma-gearhart@uky.edu	Phone: 257.2629

d.	Requested Effective Date: ☒ Semester following approval OR ☐ Specific Term/Year[1] : ____

2.	**Designation and Description of Proposed Course.**
a.	Prefix and Number: EDC 706
b.	Full Title: Research In STEM Education
c.	Transcript Title (if full title is more than 40 characters): ____
d.	To be Cross-Listed[2] with (Prefix and Number): N/A

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.

____ Lecture	____ Laboratory[1]	____ Recitation	2 Discussion	____ Indep. Study
____ Clinical	____ Colloquium	____ Practicum	1 Research	____ Residency
____ Seminar	____ Studio	____ Other – Please explain: ____		

f.	Identify a grading system: ☒ Letter (A, B, C, etc.) ☐ Pass/Fail
g.	Number of credits: 3

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:	Students will have the opportunity to learn about the research paradigms guiding STEM education research throughout history with critical analysis of those most utilized across the modern STEM education research communities. Students will acquire knowledge and skills that allow them to develop a research proposal with explicit discussion of their research assumptions and that targets meaningful and timely research questions in STEM education.

j.	Prerequisites, if any: EDL 651, or EDP/EPE 557 and EPE 570, or EDP/EPE 660 or permission of instructor
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

---

[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.

Rev 8/09

REQUEST FOR NEW COURSE

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: The course will be offered every 3rd semester.		

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? 15		

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 in STEM Related Fields		

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: _____		
b.	Will this course be a new requirement[5] for ANY program?	YES ☒	NO ☐
	If YES[5], list affected programs: Master of Science in STEM Education		

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.

REQUEST FOR NEW COURSE

Signature Routing Log

General Information:

Course Prefix and Number: EDC 706

Proposal Contact Person Name: Jana Bouwma-Gearhart   Phone: 257.2629   Email: jana.bouwma-gearhart@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
Curriculum & Instruction	1/30/10	Mary Shake / 257.5676 / mcshak1@email.uky.edu	Mary C. Shake
Courses + Curricula	1/26/10	Jeff Reese 257-4909 jeff.reese@uky.edu	Jeff R
College of Education	2/9/10	Robert Shapin 257-1795 rshap01@uky.edu	Robert Sh
		/ /	
		/ /	

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.

EDC 706: Research in STEM Education
SYLLABUS

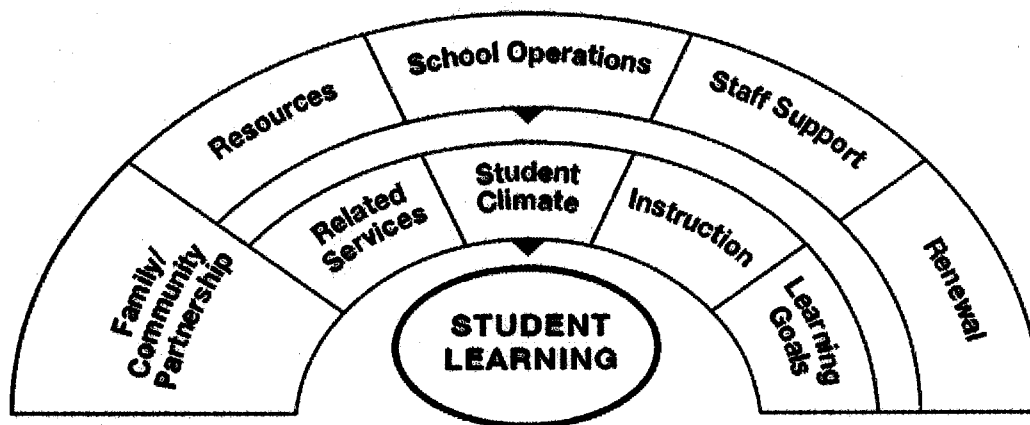### "Research and Reflection for Learning and Leading"

Instructor:	Jana Bouwma-Gearhart
Office Location	112 TEB
Phone Number	257.2629
Email	Jana.bouwma-gearhart@uky.edu
Office Hours	Arranged individually through email; Skype and iChat access also available
Technological Requirements	Computer with internet access or access to UK computer facilities. Access to digital video devices (digital camera, digital video recorder, laptop webcams)
For Technological assistance	Contact TASC at or call 859.257.8272 Contact Information Technology Customer Service Center 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	
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	

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.

Leadership, and specifically Teacher Leadership, within our framework of *Research and Reflection for Learning and Leading*, is informed by the "Framework for School Leadership Accomplishments" (Bellamy, Fulmer, Murphy, & Muth, 2007, p. 34). In this framework, *student learning* is the central objective and it is accomplished through nine interactive, collaborative efforts by diverse stakeholders (see Figure 1 below). Permission to use this model was granted by Bellamy and his colleagues.

Figure 1. Framework for School Leadership Accomplishments[1]

This framework is designed to help actualize the theme, *Research and Reflection for Learning and Leading*, and thus prepare a skilled and influential group of leaders who will work as members of learning communities focused on the essential goal of schools: student learning.

---

[1] Bellamy, T., Fulmer, C., Murphy, M., & Muth, R. (2007). *Principal accomplishments: How school leaders succeed.* New York: Teachers College Press.

Course Overview/Objectives:

Prerequisites:
EDL 651, or EDP/EPE 557 and EPE 570, or EDP/EPE 660 or permission of instructor

Course Overview:
EDC 706 will give students the opportunity to learn about the research paradigms guiding STEM education research throughout history with critical analysis of those most utilized across the modern STEM education research communities. Through reading of primary research literature documenting key findings in STEM education, students will compare various research paradigms, and associated philosophical assumptions and methods, utilized in STEM education research, specifically with respect to diverse STEM education environments and audiences. Students will acquire knowledge and skills that allow them to develop a research proposal with explicit discussion of their research assumptions and that targets meaningful and timely research questions in STEM education.

Course Objectives/Student Learning Outcomes:
- Students will study STEM research paradigms and related assumptions and methodologies through reading of primary research articles chosen to document STEM education research history and key findings.
- Students will evaluate the advantages and disadvantages of a variety of STEM education research paradigms and related assumptions and methods.
- Students will learn how to conduct a literature review leading to meaningful and timely research questions and justification of a relevant research design.
- Students will design a STEM education research project that demonstrates strong knowledge of their paradigm and methodologies of choice, understanding of relevant literature to pose meaningful and timely questions, and an overall strong research design, including proposed instruments and methods and tools for data analysis and presentation.
- Students will use and analyze STEM qualitative and quantitative research technologies.
- Students will evaluate a variety of STEM education research conclusions for validity, reliability, and generalizability with respect to diverse STEM education environments and audiences.
- Students will learn about research-confirmed best STEM teaching, learning, and research practices.

Course Delivery
This proposed course is designed as a hybrid course. Course participants will attend class on campus for the first half of the semester. Thereafter, online distance learning instruction will be conducted throughout the second half of the semester. During this time students will work in on independent literature reviews and the development of a research proposal and students will meet virtually with the instructor at least once a week or as needed. Students will also participate in online discussions during the distance learning segment of the course. Class

participants will meet on campus two times during the second part of the semester to present progress on their research project designs and their final research proposals.

Software (to be provided on 4 class computers for students' use)
QSR NVivo
Diction
Microsoft Excel/Analysis ToolPak
SPSS

Grading Scale
100 – 91: A   90 – 81: B   80 – 71: C   70 and below: E

Course Assessment Tasks:

Assignments must be submitted on or before the due dates given in the course schedule. **Five percent will be deducted from the value of an assignment for each day it is late,** unless prior arrangements have been made with the instructor. Full descriptions of these assignments and evaluation rubrics for each are appended to this syllabus.

Task	Task Description	Standards Alignment
Research Proposal	Students will participate in a semester-long research project design, resulting in a well-developed proposal, complete with discussion of guiding paradigm, methodologies, literature review, meaningful and timely research questions, and proposed research instruments. Students will also propose how they intend to address the reliability, validity, and generalizability of their research and how they will collect and analyze their data/observations and present their research findings and conclusions. Students will present/share their status with peers and instructor throughout the semester.	KTS 1, 2, 3, 4, 5, 6, 10
Reflections	Students will write critical and reflective responses regarding their reading of primary research and other class readings; write reflections on their progress on their research proposal and in-class discussions and activities; participate in oral discussion, in person and virtually; and present their proposal progress and final project both orally and through writings to the rest of the class.	KTS 7, 8, 10

Data Analysis Technology Use and Evaluation	Students will write an analysis of a particular technology for use in performing STEM education research. Students will discuss the relevant merits of the various technologies with the rest of the class.	KTS 1, 3, 5, 6, 7, 8, 10
Research Journal	Students will maintain a reflective journal concerning the semester-long research proposal project.	KTS 1, 5, 10

Course Outline

Topic 1: Key research findings regarding STEM student learning	Ontological assumptions in STEM education research
Topic 2: Key research findings regarding STEM educator professional development	Epistemological assumptions in STEM education research
Topic 3: Key research findings regarding STEM education history and policy	Methodological assumptions in STEM education research
Topic 4: Key research findings regarding STEM education culture and sociology	The research methods of STEM education research
Topic 5: Key research findings regarding STEM education research	The research tools and technologies of STEM education research

Course Policies

Addressing Themes of Diversity, Assessment, and Technology

All UK professional education programs address and affirm the value of diversity in education, the use of technology to support all aspects of instructional programming, and the importance of attaining high levels of skill in assessing the outcomes of instruction. This course will provide students an opportunity to demonstrate attention to these themes and reflect on the mechanisms that this course has provided to demonstrate improved skills in these areas.

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

Evidence of professional dedication will be expected throughout this course and in all course-related interactions. Credit for participation and professionalism will be part of the evaluation. This means, in part, that we expect your regular, punctual attendance and participation. If you miss a class for any reason, it is **your** responsibility to contact the instructor and to make up any work.

Attendance, Participation, and Professionalism together

1. Students will attend all class meetings and field placement sessions.
2. Students will complete all assignments prior to scheduled discussions and due dates (see course calendar).
3. Students will attend all class meetings and be active participants.
   a. Active participation may include: verbal participation in discussions, asking questions or responding to peers or instructor in constructive ways, clearly demonstrating active listening (taking notes, paying attention, etc.), and communicating with the instructor via office meetings and/or email.
4. Absences will be communicated in advance and in writing to the instructor, or will do so as soon as possible.
   a. It is the **student's** responsibility to pursue make-up work and collect materials and information from missed class meetings.

   Students will conduct themselves in a professional and ethical manner.
   b. They will be punctual, presentable, respectful of peers and instructors, and they will be honest in their academic efforts.
   c. They will attend to and engage course materials to learn and improve their knowledge, understanding, and practice as teachers.
5. Attendance, participation, and professionalism will be assessed holistically based on the above criteria, and will be used to determine the outcome of borderline grades.

6. Students are encouraged to communicate regularly with the instructor so that they are aware of their standing.
7. Students who fail to attend class, participate as expected, and/or conduct themselves professionally or ethically will be required to meet with the instructor to set improvement goals.
8. Poor conduct or lack of participation may negatively affect their course grades.
9. 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.
10. In non-emergency situations, late work will not be accepted without <u>prior</u> arrangements with the instructor.
    a. The instructor reserves the right to refuse late work or to accept late work for reduced credit unless the student has made prior arrangements with the instructor.

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.

Classroom Behavior, Decorum, and Civility (aka, Ethics Statement)
This course and its participants will not tolerate discrimination, violence, or vandalism. EDC 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 graduate students, future teachers, and ambassadors for the University of Kentucky.   Any unethical behavior in class may result in failure for the course and/or expulsion from the 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 the instructor 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

The UK Department of Curriculum and Instruction 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 instruction in Kentucky's secondary schools is directly and indirectly affected by this department'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 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 students 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.

Commitment to Addressing the Achievement Gap

The UK Department of Curriculum and Instruction aligns itself with the positions of the NCTM, NCSS, NSTA, and NCTE regarding cultural and linguistic diversity. The program seeks to underscore that cultural and linguistic diversity should be treated as integral components of public education, and that the failure to accommodate such diversity in curriculum and instruction contributes to disparities in student achievement across racial populations—a phenomenon popularly referred to as "the achievement gap."

Commitment to Technology

The UK Department of Curriculum and Instruction is committed to teaching students so they use technology as a personal and professional tool. Our program is guided by NCATE standards, UK College of Education Technology Standards, EPSB Teacher Standards, and SPA Standards as they relate to technology. Students are required to use technology for a majority of their classes. Students use technology for class assignments, lesson plan design and preparation, class presentations, record keeping, and data analysis. Students are required to successfully complete course work focusing on using technology. Our students 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 students 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 students access to "smart" classrooms and technology labs in order to further facilitate their use of technology.

List of References

The following texts align with the Kentucky Teacher (Initial) Standards, NCATE/NCTM Standards, NCATE/NSTA Standards, Common Core Standards, Proposed Kentucky Teacher Leader Standards, ISTE, and EPSB theme.

KY Learner Goals and Expectations, Program of Studies and Core Content – online documents
        (or their replacements as they become available)

Subject-area Professional Association (SPA) K-12 standards.

Common Core Standards (as they become available) and their related documents
        (www.commoncore.org)

American Psychological Association. (2009*). Publication manual of the American psychological association (6th ed.).* Washington D.C.: American Psychological Association.

Gay, L.R., Mills, G.E. and Airasian, P. (2006*). Educational Research: Competencies for Analysis and Application (8th. ed.).* Upper Saddle River, NJ: Prentice Hall.

Additionally, the following list reflects suggested readings that would guide the curriculum of the course

Abell, S.K. & Lederman, N.G. (2007). *Handbook Of Research On Science Education,* Lawrence Erlbaum Associates

American Educational Research Association. (1992). Ethical standards of the American Educational Research Association. *Educational Researcher*, 21(7), 23-26.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1985). *Standards for educational and psychological testing.* Washington, DC: Authors.

Atkinson, P., & Hammersley, M. (1994). Ethnography and participant observation. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 248-261). Thousand Oaks, CA: Sage.

Baer, D.M. (1977). Reviewer's comment: Just because it is reliable doesn't mean that you can use it. *Journal of Applied Behavior Analysis*, 10, 117-119.

Bogdon, R.C., & Biklen, S.K. (1992). *Qualitative research for education: An introduction to theory and methods (2nd ed.)*. Boston: Allyn & Bacon.

Borrego, M. (2007). Development of engineering education as a rigorous discipline: A study of the publication patterns of four coalitions. *Journal of Engineering Education*, 96(1), 5-18.

Bransford, J.; Brown, A.L.; & Cocking, R.R. (2000). *How people learn: Brain, mind, experience, and school*, Expanded Edition. Arlington: NSTA Press.

Carver, R. (1993). The case against statistical significance testing, revisited. *Journal of Experimental Education*, 61(4), 287-292.

Charmaz, Kathy C. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: Sage.

Creswell, J.W. (2002). *Educational research: planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Prentice Hall.

Creswell, J.W. (1994). *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage Publications.

Daniel, D., C. Fauske, P. Galeno and D. Mael (2001). *Take charge of your writing: Discovering writing through self-assessment*. Boston: Houghton Mifflin.

Denzin, Norman K., & Lincoln, Yvonna S. (Eds.) (2007). *Collecting and interpreting qualitative materials* (3rd ed.). Thousand Oaks, CA: Sage.

DeBoer, G. (1990). *A history of ideas in science education*. New York: Teachers College Press.

Dunkin, M.J. (1996). Types of error in synthesizing research in education. *Review of Educational Research*, 66, 87-98.

Educational Resources Information Center (1982). *ERIC processing manual (Section 5: Cataloging)*. Washington, DC: Author.

English, L. (2002) (Ed.), *Handbook of international research in mathematics education* (219-240). Mahwah, NJ: Lawrence Erlbaum Associates.

Federal Register. (1991). Federal policy for the protection of human subjects; notices and rules, Part II. *Federal Register*, 56, 28001-28032.

Fielding, A. (2006). *Discovering statistics using SPSS* (2nd ed.). Thousand Oaks, CA: Sage.

Flagg, B. N. (1990). *Formative evaluation for educational technologies*. New Jersey: Lawrence Erlbaum Associates Publishers.

Fowler, F.J. (1993). *Survey research methods.* Newbury Park, CA: Sage.

Fraenkel, J.R., & Wallen, N.E. (2003). *How to design and evaluate research in education (5th ed.).* New York: McGraw-Hill.

Girden, E. R. (2001). *Evaluating research articles: From start to finish* (2nd ed.). Thousand Oaks, CA: Sage.

Howe, K., & Eisenhart, M. (1990). Standards for qualitative (and quantitative) research: A prolegomenon. *Educational Researcher,* 19(5), 2-9.

Hinkle, D.E., Wiersma, W., & Jurs, S.G. (2003). *Applied statistics for the behavioral sciences, Fifth Edition.* Boston, MA: Houghton Mifflin.

Hubbard, R.H., & Power, B.M. (2003). *The art of classroom inquiry: A handbook for teacher-researchers.* Portsmouth, NH: Heinemann.

Kazdin, A.E. (1982). *Single-case research designs: Methods for clinical and applied settings.* New York: Oxford University Press.

Kilpatrick, J. (2001). Where's the evidence? *Journal for Research in Mathematics Education.* 32(4): 421-427.

Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge University Press, UK.

Lohmann, J. R. (2008). *Advancing the global capacity for engineering education research (AGCEER): A year of international dialogue.* In Proceedings of the 2008 American Society for Engineering Education Annual Conference, Pittsburgh, PA, June 22-25, 2008.

Marshall, C., & Rossman, G.B. (1995). *Designing qualitative research (2nd ed.).* Thousand Oaks, CA: Sage.

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach. (2nd Ed.)* Thousand Oaks, California: Sage.

Mordock, J.B. (1995). Institutional review boards in applied settings: The role in judgements of quality and consumer protection. *Psychological Science,* 6, 320-321.

National Council of Teachers of Mathematics. (1994). *Assessment standards for school mathematics.* Reston, VA: NCTM.

National Research Council (1999). *How people learn: Brain, mind, experience, and school.*
        National Academy Press, Washington, D.C.

Salkind, N. J. (2000). *Statistics for people who (think they) hate statistics.* Thousand Oaks, CA:
        Sage.

Schmuck, R. (2006). *Practical action research for change.* Arlington Heights, IL: Skylight.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in
        education and the social sciences (3rd ed.).* New York: Teachers College.

Schoenfield, A.H. (2000). Purposes and methods of research in mathematics education. *Notices
        of the American Mathematical Society.* June/July (2000): 641-649.

Shaver, J. (1993). What statistical significance testing is, and what it is not. *Journal of
        Experimental Education*, 61(4), 293-316.

Smith, J.K. (1983, March). Quantitative versus qualitative research: An attempt to clarify the
        issue. *Educational Researcher*, 6-13.

Tawney, J.W., & Gast, D.L. (1984). *Single subject research in special education.* Columbus,
        OH: Merrill.

Wicklein, R. S., & Schell, J. W. (1995). Case studies of multidisciplinary approaches to
        integrating mathematics, science and technology education. *Journal of Technology
        Education*, 6(2).

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).

Course Number and Prefix: EDC 706   Date: 11/6/09

Instructor Name: Jana Bouwma-Gearhart   Instructor   Email: jana.bouwma-

gearhart@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 is through electornic discussion boards and online chat, class materials are avialable from the download sites, and assignments are distributed and collected online. Students in the course will

Abbreviations: TASC = Teaching and Academic Support Center   DL = distance learning   DLP = Distance Learning Programs
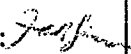
Revised 3/09

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!**

		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 an advanced graduate class, course assessment 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. Final student presentations will be given in the final class face-to-face meeting on campus.
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? Yes.
		If yes, which percentage, and which program(s)? *Fifty-percent of the Master of Science in STEM Education will be delivered through distance learning.* *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 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 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 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

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

Revised 3/09

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!

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:
	○ "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)
	○ Carla Cantagallo, DL Librarian
	○ Local phone number: 859 257-0500, ext. 2171; long-distance phone number: (800) 828-0439 (option #6)
	○ Email: dllservice@email.uky.edu
	○ 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: Jana Bouwma-Gearhart Instructor Signature: