

**Campbellsville University**

**Mathematics Division**

**MTH 550**

**METHODS AND MATERIALS OF TEACHING MATHEMATICS**

**FALL, 2015 – 3 Semester Hours**

**Professor: Janet Miller, Ph.D.**

***Office*** - Carter Hall,

***Office hours*** - MWF 12-2 p.m., and TTh 10:30-11 a.m., and T 2-3 p.m. or by appointment

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**Conceptual Framework of Teacher Education:**

**THEME: “EMPOWERMENT FOR LEARNING”**

**Empowerment processes:**

**Content, process and self-efficacy**

**Model:**

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**MISSION:**

Campbellsville University’s School of Education, in keeping with the spirit of Campbellsville University, seeks to prepare teachers by providing an academic infrastructure based on scholarship, service, and Christian leadership. The primary aim of the program is to advance scholars who are competent and caring educators committed to life-long learning in a diverse society.

**TEXT: *Teaching Secondary and Middle School Mathematics, 4th* edition, Daniel J. Brahier, 2013 ISBN: 978-0-13-269811-5**

**COURSE DESCRIPTION:** Technology and research are combined to help preservice teachers understand curriculum, teaching, and assessment issues and their relationship to middle and high school mathematics. Candidates will acquire 20 field hours during the course.

**STUDENT LEARNING OBJECTIVES:**

Students will:

1) discuss mathematics as a process and discuss learning theories and psychology in mathematics

education.

2) demonstrate knowledge of the curriculum and its development in secondary and middle school

mathematics, as well as the NCTM Curriculum Standards.

3) use materials and model “teaching mathematics”, which includes lesson planning and “mock

classroom” presentations.

4) show knowledge of the role of assessment in mathematics and the NCTM standards associated with

effective assessment.

5) examine the Kentucky Teacher Standards and demonstrate an understanding of each of the ten

standards.

6) do 20 field hours during this semester: observation, tutoring, teaching assisting, individual

instruction, and/or research. Ten of these hours must be turned in after fall break on the Oct. 20,

Tuesday, class meeting. All paper work for these hours must be turned in with the hours. The

remaining ten hours must be turned in after Thanksgiving Break at the Dec. 1, Tuesday, class meeting.

Again, all paper work for these hours should be turned in with the hours.

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|  | **Alignment of Course Performance Assessments with National and State Standards** | | | | |
|  | **Course**  **Performance**  **Assessments** | **Standards for NCTM for Secondary and Middle Grades**  **ILA** | **KY Teacher**  **Standards /**  **AMLE** | **EPSB**  **Themes** | **Conceptual**  **Framework:**  **Theme**  **Model\*** |
| **1.** | Tests | NCTM A/B 1, A/B 2, A/B 3, A/B 4, A/B 5  ILA 1 | KTS  1-Content  2-Assess  AMLE  2, 3 | Diversity Assessment Literacy  Education Closing the achievement gap | **Theme**:  Content Process  **Model:** 1, 2, 3, 6, 8 |
| **2.** | Presentation/  Lesson | NCTM A1-5  B1-5  ELA 2, 3, 4, 5 | KTS  1-Content  2, 4 Plan and Implement  6-Technology  7-Reflect  AMLE 1, 2, 3, 4 | Diversity Assessment Literacy | **Theme**: Content Process Self-Efficacy  **Model:** 1, 2, 3, 5, 6, 8 |
| **3.** | Presentation:  Website | NCTM A1-5  B1-5  ILA 5 | KTS  1-Content  2-Design  4-Implement  5-Assess  6-Technology  AMLE 4 | Diversity Literacy Closing the achievement gap | **Theme**: Content Process Self-Efficacy  **Model:** 1, 2, 3, 4, 5, 6, 8 |
| **4.** | Presentations | NCTM A1-5, B1-5  ILA 1, 6 | KTS  1-Content 2-Design 4-Implement 5-Assess 6-Technology 7-Reflect 9-Professional Growth 10-Leadership  AMLE  1, 2, 3, 4 | Diversity Assessment  Closing the Achievement Gap | **Theme**: Content Process Self-Efficacy  Model: 1, 2, 3, 4, 5, 6, 8 |
| **5.** | Field Experiences | NCTM A1-5, B1-5  ILA 1, 2, 3, 4, 5, 6 | KTS  1-Content  2-Design  3-Climate  4-Implement  5-Assess  6-Technology  7-Reflect  8-Collaboration  10-Leadership  AMLE  1-5 | Assessment | **Theme**:  Content  Process  Self-Efficacy  **Model**: 1, 3, 4, 6, 7, 8 |
| **\* Model**: **1**-Student Learning; **2**-Learning Theory; **3**-Pedagogy; **4**-Technology; **5**-Assessment;  **6**-Diversity; **7**-Partnerships/Learning Community; **8**-Knowledge, Skills, Dispositions | | | | | |

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| **C. KTS Diversity Indicators** | | |
|  |  | Course Assignments |
| **KTS 1.2** | Effectively connect content to students’ life experiences including, when appropriate, prior learning in the content area or other content area. | 2, 5 |
| **KTS 1.4** | Regularly guide students to understand content from appropriate diverse, multicultural or global perspectives. | 2, 5 |
| **KTS 2.1** | Develop challenging and appropriate learning objectives that are aligned with local/state/national standards and are based on students’ needs, interests and abilities. | 2, 5 |
| **KTS 2.2** | Plan and designs instruction that is based on significant contextual and pre-assessment data. | 2, 5 |
| **KTS 2.3** | Plans a learning sequence using instructional strategies and activities that build on students’ prior knowledge and address learning objectives. | 2, 5 |
| **KTS 3.3** | Values and supports student diversity and addresses individual needs: Consistently uses appropriate and responsive instructional strategies that address the needs of all students. | 2, 5 |
| **KTS 4.2** | Implements instruction based on diverse student needs and assessment data: Implements instruction based on contextual information and assessment data, adapting instruction. | 2, 5 |
| **KTS 5.4** | Consistently describes, analyzed and evaluates student performance data to determine student progress, identify differences among student groups and inform instructional practice. | 2, 5 |
| **KTS 6.1** | Uses appropriate technology to design and plan instruction that supports and extends learning of all students. | 2, 5 |

**COURSE REQUIREMENTS:**

***NOTE: All assignments are the same for the traditional candidates and the Option 6 candidates except field hour assignments.***

**1) Attendance:** Each student is expected to attend *every* class meeting. The University’s Undergraduate Student Attendance Policy will be followed.

**2) Tests:** There will be four one-hundred point exams. The first will be over Chapters 1 and 2, Test #2 – Chapters 6, 7, 8 and 9, Test #3 – Chapter 3, 4, and 5, and Test #4 – Chapters 10 – 13 (Final Test).

**3)** **Five classroom presentations** will also be required with different teaching strategies involved.

#1 – **Chap. 2** – 10-15 min. Website Presentation - 40 points

#2 – **Chap. 7** – 20 min. Manipulatives – 40 points

#3 - **One the following five Math conceptual categories**: 1) number and quantity, 2) algebra,

3) functions, 4) geometry, and 5) probability and statistics and should include cooperative group

work, manipulatives, and/or technology. This presentation should be approximately 25-30

minutes in length and require a Lesson Plan with the Kentucky Academic Standards (KAS) for

Mathematics specified. This presentation with the written Lesson Plan will be worth 50 points

with the points being assigned using the 10 Kentucky Teacher Standards included in a scoring

rubric. Lesson plans must also include the literacy standards for reading and writing.

#4 - **Topics specified in Chapter 8 and 9**, and should be a different strand than the third presentation.

A shortened lesson plan is required with this presentation and 50 points will be assigned using the

10 Kentucky Teacher Standards included in a scoring rubric.

#5 - **The final presentation will involve** **teaching Chapters 10-13**. This can be done by PowerPoint

presentation, lecture, etc. The student will select 10 M/C questions and 1 essay question from his

chapter for the final test. – 50 points

**Participation:** There will be 1.5 participation points given during each day of student presentations to

total 15 points. To receive the 1.5 points you must be in attendance the day of the presentation and

participate as appropriate.

**4. Field Hours:** 100 points will be given for completion of the 20 field hours by the date specified (two points per hour completed, three points for a thorough analysis of each field hour including proper grammar and sentence structure). Field hours should include a combination of observation, tutoring, assisting, and instruction and should include at least one lesson that is aligned with the ELA standards for reading and writing and that includes the KAS math standards. Field hours tied to specific assignments, key assessments, and School of Education Field Experience Forms are required of both the traditional and Option 6 candidates, Field Experience forms must be submitted to the course professor and the School of Education.

**5. Conceptual Map: Chapter 6**: 25 points

It is possible to earn 770 points during the semester:

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| **Course Requirement** | **Possible Points** |
| 4 Tests @ 100 points each | 400 points |
| 20 Field Hours with reflections and lesson | 100 points |
| 3 presentations @ 50 pts. | 150 points |
| 2 presentations @ 40 pts. each | 80 points |
| Attendance @ other presentations @ 1.5 pt. per day | 15 points |
| 1) Web-Site – Sept. 3 (1 day) |  |
| 2) Manipulatives – Oct. 1, 6 (2 days) |  |
| 3) Math Topic – Oct. 20, 27, Nov. 3 (3 days) |  |
| 4) Chapter 8,9 topic – Nov. 10, 17 (2 days) |  |
| 5) 1 Chapter 10-13 – Nov. 24, Dec. 1 (2 days) |  |
| Chap. 6 – Conceptual Map – Sept. 22 | 25 points |
| **TOTAL** | **770 points** |

The grading scale is as follows:

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| 690 – 770 points | A | 90 - 100 |
| 613 – 689 points | B | 80 - 89 |
| 536 – 612 points | C | 70 - 79 |
| 459 – 535 points | D | 60 – 69 |
| Below 458 points | F | 0 - 59 |

**Electronic Devices:**  Any electronic device must be silenced during class time. No keyboard or programmable device will be permitted on exams or tests. Scientific calculators may be used at all times.

**4) Teaching Methods:** Students will be taught through class participation, presentation, class discussion, lecture, group work, assigned written work, and problem solving.

**COURSE OUTLINE:** I. Nature of mathematics education: Chapters 1 and 2

II. Teaching mathematics

A. Planning for Instruction – Chapter 6

B. Teaching tools and strategies – Chapter 7

C. Teaching specific math content

i) Number Sense and Algebra – Chapter 8

ii) Geometry, Statistics/Probability, Discrete Mathematics – Chapter 9

III. Learning theories and psychology in math – Chapter 3

IV. The mathematics curriculum – Chapters 4 and 5

V. Assessment in mathematics – Chapters 10-11

VI. Meeting Individual Student and Teacher Needs – Chapter 12-13

**Policies**

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| **Policy #1 CU Disability Statement:**  Campbellsville University is committed to reasonable accommodations for students who have documented learning and physical disabilities, as well as medical and emotional conditions. If you have a documented disability or condition of this nature, you may be eligible for disability services. Documentation must be from a licensed professional and current in terms of assessment. Please contact the Director of Disability Services at 270-789-5192 to inquire about services. |
| Policy #2 CU Plagiarism Policy:   * Campbellsville University’s policy on Academic Integrity states: “Each person has the privilege and responsibility to develop one’s learning abilities, knowledge base, and practical skills. We value behavior that leads a student to take credit for one’s own academic accomplishments and to give credit to others’ contributions to one’s course work. These values can be violated by academic dishonesty and fraud.” (2015-2017 Bulletin Catalog). * Plagiarism and cheating are examples of academic dishonesty and fraud and neither will be tolerated in this course. Plagiarism is quoting or paraphrasing a phrase, a sentence, sentences, or significant amounts of text from a web or print source, without using quotation marks and without a citation. The plagiarist submits the work for credit in a class as part of the requirements for that class. Examples of cheating include cheating on a test (copying off someone else’s paper) or an assignment (e.g., development of a lesson plan) and submitting the work as your own. * If a student commits plagiarism or cheats in this course, the professor will decide on one of two penalties: (a) an F on that assignment or (b) an F in the course. The student’s Dean and the Vice-President for Academic Affairs will be notified of either consequence. |
| **Policy #3 Progress:**   * Students are expected to complete all assignments in a professional manner. * All course information and grades will be added to TigerNet LMS. * Students will not be assigned a final grade until all course requirements, including field experiences are submitted. |
| **Policy #4 Incomplete Statement**  A grade of “I” is assigned to a student when the course requirements are not completed due to illness, accident, death in the immediate family, or other verifiable, extenuating circumstances. The course requirements to change the “I”; grade must be completed within 12 months from the time awarded. It is the student’s responsibility to complete requirements within the 12 month period. It is the professor’s responsibility to change the grade by filling out the proper forms in the Office of Student Records.  **Policy #5 Title IX Statement**  Campbellsville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires all responsible employees, which includes faculty members, to report incidents of sexual misconduct shared by students to the University's Title IX Coordinator.  Title IX Coordinator: Terry VanMeter; 1 University Drive; UPO Box 944; Administration Office 8A; Phone – 270-789-5016; Email – [twvanmeter@campbellsville.edu](mailto:twvanmeter@campbellsville.edu)  Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: [www.campbellsville.edu/titleIX](http://www.campbellsville.edu/titleIX)  **Policy #6 Student Academic Progress (SAP)**  Department of Education federal regulations require Campbellsville University to monitor its student's academic progress to ensure that they maintain a minimum standard GPA and make steady progress toward degree completion. Students who do not meet the SAP requirements may lose their financial aid eligibility.  All students that were enrolled during the current school year and those who have submitted a FAFSA for the upcoming year will be evaluated for SAP at the end of each term including summer. See your Student Handbook for specific details and/or discuss with your advisor.  **Communication Requirement**  Students are expected to activate and regularly use the university provided email domain (studentname@stu.campbellsville.edu) for all email communication for this class. |

**SECURITY CONTACTS:**

Security cell phone: 270-403-3611

Security office phone: 270-789-5556

**References:**

Arem, C. (2003). Conquering Math Anxiety, Brooks/Cole/Thomson Learning.

Charles. C. M. (2000) The Synergetic Classroom: Joyful Teaching and Gentle Discipline. Addison Wesley

Longman, Inc.

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Lott, J. & Lott, C. (2015) Mathematics Lessons Learned from Across the World 7-12. NCTM.

Nakamura, R. M. (2000) Healthy Classroom Management: Motivation, Communication, and Discipline*,*

Wadsworth.

Teaching Math in Middle School:

<http://www.nctm.org/publications/mathematics-teaching-in-the-middle-school/>

Wallace, F. & Evans, M. A. (2012). [Mathematical Literacy in the Middle and High School Grades: A Modern Approach to Sparking Student Interest, 1](http://www.amazon.com/Mathematical-Literacy-Middle-School-Grades/dp/0132180979/ref=sr_1_2?ie=UTF8&qid=1447705165&sr=8-2&keywords=teaching+math+in+middle+and+high+schools" \o "Mathematical Literacy in the Middle and High School Grades: A Modern Approach to Sparking Student Interest)[st](http://www.amazon.com/Mathematical-Literacy-Middle-School-Grades/dp/0132180979/ref=sr_1_2?ie=UTF8&qid=1447705165&sr=8-2&keywords=teaching+math+in+middle+and+high+schools" \o "Mathematical Literacy in the Middle and High School Grades: A Modern Approach to Sparking Student Interest) [Edition. Pearson.](http://www.amazon.com/Mathematical-Literacy-Middle-School-Grades/dp/0132180979/ref=sr_1_2?ie=UTF8&qid=1447705165&sr=8-2&keywords=teaching+math+in+middle+and+high+schools" \o "Mathematical Literacy in the Middle and High School Grades: A Modern Approach to Sparking Student Interest)