OFFICE OF CHIEF OPERATIONS OFFICER Summary of State Board of Education Items June 19-20 2014

OFFICE OF EDUCATOR LICENSURE

36. <u>Approval of request from the University of Southern Mississippi for a degree in</u> <u>Instructional Technology/Business Technology Education Concentration with the</u> <u>added supplemental endorsements 405 Business Management and 411 Business</u> <u>Technology as recommended by the Commission on Teacher and Administrator</u> <u>Education, Certification and Licensure and Development</u>

Background Information:

Currently, students at the University of Southern Mississippi (USM) earn a 105 Business Education endorsement after successful completion of the following: (1) Instructional Technology (Business Technology Education) emphasis IHL program, (2) Praxis II: Business Education and (3) Praxis II: Principles of Learning and Teaching.

USM is proposing to include 405 Business Management and 411 Business Technology to the list of approved supplemental endorsements that students can qualify for after completion of the program.

The Commission on Teacher and Administrator Education, Certification and Licensure and Development approved the request on May 13, 2014.

Recommendation: Approval

Back-up material attached

 TO: Ms. Cerissa Neal, Bureau Director Educator Licensure Mississippi Department of Education
 VIA: Mr. Mike Mulvihill Bureau Director for Compliance and Reporting
 FROM: Diane J. Fisher, Ph.D., Coordinator Instructional Technology—Business Technology Education emphasis The University of Southern Mississippi
 DATE: January 8, 2014

SUBJECT: License # 405 and 411

We request that the degree in Instructional Technology/Business Technology Education (BTE) emphasis be approved with the added supplemental endorsements of 405 Business Management and 411 Business Technology.

Students at The University of Southern Mississippi currently earn a 105 license after successful completion of the Instructional Technology (Business Technology Education emphasis) IHL program, Praxis II in Business Education, and Principles of Learning and Teaching. In addition to the 105 license, the Mississippi Department of Education has approved the following add-on endorsements for students completing the methods courses in the Business Technology Education curriculum.

License 111, Computer Applications License 193, Economics License 917, Career Pathway Experience License 952, Finance and Accounting Pathway License 955, Business Management Pathway License 956, Marketing Pathway License 981, Information and Communication Technology (ICT) I License 982, Information and Communication Technology (ICT) II License 984, Technology Foundations

We are proposing to include Endorsement 405 Business Management and Endorsement 411 Business Technology to the list of approved add-on endorsements. The requirements for these endorsements will be satisfied as follows:

405 Business Management

- 1. Students will hold a license in 105 Business Education.
- 2. Students will satisfy the Internet and Computing Core (IC³) requirement by successfully completing IT 451, Teaching Skill-Based Subjects in Business Education. (This has already been approved by MDE).
- 3. Students will satisfy the online learning requirement by successfully completing IT 456, Methods in General and Career/Technical Business Education. (This has already been approved by MDE).
- 4. Students will complete the following three methods courses: IT 456, Methods in General and Career/Technical Business Education, IT 451, Teaching Skill-Based Subjects in Business Education, and IT 453, Techniques of Coordination.

411 Business Technology

- 1. Students will hold a license in 111 Computer Applications.
- 2. Students will satisfy the Internet and Computing Core (IC³) requirement by successfully completing IT 451, Teaching Skill-Based Subjects in Business Education. (This has already been approved by MDE).
- 3. Students will satisfy the online learning requirement by successfully completing IT 456, Methods in General and Career/Technical Business Education. (This has already been approved by MDE).
- 4. Students will complete the following three methods courses: IT 456, Methods in General and Career/Technical Business Education, IT 451, Teaching Skill-Based Subjects in Business Education, and IT 453, Techniques of Coordination.

A degree plan listing all courses in the Instructional Technology/Business Technology Education degree is attached.

INSTRUCTIONAL TECHNOLOGY (BUSINESS TECHNOLOGY EDUCATION) BS

Degree Plan (ITBTEBS)

Берес	(11) 1200)
GENERAL EDUCATION CURRICULUM	GEC 06. Computer Competency Requirement 01. Successful completion of the BTLE or IC ³ certification
GEC 01. Written Communication (6 hours)	
01. ENG 101	GEC 07. Writing-Intensive Requirement (Major Area)
02. ENG 102	01. IT 380 (WI)
GEC 02 Natural Salance and Mathematica (11 hours minimum)	ENG 101 & ENG 102 prerequisites
GEC 02, Natural Science and Mathematics (11 hours minimum)	GEC 08 Speaking Intensive Decuirement (2 hours)
Science Requirement (8 nours minimum)	OLC US. Speaking-intensive requirement (5 hours)
01. Select 2 courses with labs:	01. CIVIS 111 (SI)
AST III/L	GEC 09, Capstone Requirement (Major Area)
AST 112/L	01. IT 493 (Capstone)
BSC 103/L	Must be taken Senior Year; ENG 101 & ENG 102 prerequisites
BSC 110/L	*This course estisting both the GEC requirement and a program requirement for this major
BSC 111/L	**This GEC course is recommended by this major.
BSC 250/L	***This course does not satisfy prerequisites for any other math course.
BSC 251/L	0 GEC restrictions apply; see page XXX.
CHE 104/L	GEC 06- GEC 09 courses are specific to the major.
CHE 106/L	For full description of the GEC, see page XXX.
CHE 107/L	PROCEAM CURRICULUM
GHY I04/L	TROUCHIN CORRECTION
GRY 105/L	DEG 01. Major Area of Study Requirements (33 hours)
GLY 101/L	Minimum grade of "C" required in all Major Area of Study courses.
GLY 103/L	01. IT 102
MAR 151/I	02. IT 200
	03.1T 361
	04. IT 363
	05 TT 375
	06 TT 380 (WD
PHY 201/L	07 IT 395
PHY 202/L	08 IT 452
PSC 190/L	00. TT 452
Mathematics Requirement (3 hours)	10 TT 469
02. Select 1 course:	10, 11 408
MAT 100**	(11, 11, 40)
MAT 101*	DEG 02. Additional Requirements (18 nours)
Higher-level MAT course	01 ACC 200
	01. ACC 200
GEC 03. Humanities (9 nours)	02. ACC 220
01. ENG 203	03. BA 200
02. Select 2 courses, 1 History required:	04. ECO 201.
HIS 101*	05. MG1 300
HIS 102*	06. MKT 300
PHI 151	DEG 03. Teacher Licensure Requirements (35-50 hours)
PHI 171	Certain courses are restricted; Gold Card required. Minimum grade of "C" required in all Teacher Licensure courses.
REL 131	01 Select 1 courses
GEC 04 Aesthetic Values (3 hours)	4 NT 101 ar GUV 101 ar SOC 101 ar
01 Select 1 course:	
APT 120	02. CIS 302
ARI 150 DAN 120	03. CIS 313
DAIN 130 MILIS 145	04, HIS 101*
MUS 103	05. HIS 102*
THE TOO	U6.11.451
GEC 05. Social and Behavioral Sciences (6 hours)	0.11400/L
01. Select 2 courses:	00. 11 473 (Capsione) (12 nouis) 00. NAT 101*
ANT 101*	10 DOV 110*
COH 100	10, PST 110*
ECO 101	11. PSY 3/4
GHY 101*	12. REF 469
PS 101	13. SPE 400
DOV 110*	14. Teacher education majors are required to take Praxis II
	content and PL1 tests and have scores reported to Southern
SUC 101*	Miss (code #14/9) prior to graduation.

HOURS TO DEGREE

124 hours are needed to graduate with a BS in Instructional Technology with an emphasis in Business Technology Education. At least 50 percent of the hours applied to a degree at The University of Southern Mississippi must be earned from a senior college, and 45 of these hours must be in courses numbered 300 or above. The last 25 percent of course work must be earned from Southern Miss. The student must earn at least 12 hours in the major area of study from Southern Miss.

- 3. The Annual Texas PDE Seminar, Texas A&M University, April 1988.
- Conference on Nonlinear Analysis and Partial Differential Equations, New Brunswick, NJ, May 1990.
- 5. Conference on Mathematical Approaches to the Study of Nonlincar Materials, Fayetteville, Arkansas, March, 1994.
- New Directions Short Course on Cellular Physiology, June 16-27, 2003. Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota.
- 7. The Annual Joint meeting of the AMS and the MAA, Phoenix, Arizona, January 2003. . (This was funded by the IMA including local and travel expenses.)
- 8. Mathematics Meets Biology: Epidemics, Data Fitting, and Chaos, May 26 through May 29, 2004, University of Louisiana at Lafayette. (This had a \$200 travel grant attached to it.)

TEACHING EXPERIENCE

At the undergraduate level I have taught ordinary differential equations, the entire calculus sequence, linear algebra, business calculus I and II, finite mathematics, precalculus, college algebra, foundations of mathematics, modern algebra (group theory, mostly),advanced calculus I and II, quantitative reasoning, geometry, mathematics for elementary school teachers, and, a reading course on Judaism for the Department of Philosophy and Religion. At the graduate level I have taught applied complex variables, introduction to partial differential equations, partial differential equations, integral equations, foundations of applied mathematics, introduction to probability, numerical analysis I and II, operational mathematics, and linear algebra.

AWARDS AND HONORS

- 1. Selected as one of the best teachers at Mississippi State University by the graduating seniors in Industrial Engineering in 1992.
- 2. Certificate of Merit for Outstanding Service in Academic Advising. February, 2000
- Certificate of Merit for Outstanding Service in Academic Advising. February, 2001

SERVICE CONTRIBUTIONS

- 1. Organized and lectured in the weekly Sobolev space seminar at Mississippi State University, 1989–1990 academic year.
- 2. Attending and presenting seminars in the Department of Mathematics and Statistics at Mississippi State University throughout my employment.

- Served as judge for the Region 5 Science and Engineering Fair since 1989. Served as judge for the State (Mississippi) Science and Engineering Fair 1990-1993 and 1995.
- 4. Represented the Department of Mathematics and Statistics at the 1990 and 1994 MSU Discovery Days.
- 5. Represented the General Liberal Arts at the 1995 and 1996 MSU Discovery Days, as well as setting up the Mathematics and Statistics table.
- Chaired the session "Partial Differential Equations II" at the 97th Annual Joint meeting of the AMS and the MAA, San Francisco, California, January 1991.
- Served as faculty advisor to the student war gaming club, The Mississippi State Gaming Association 1991–1994.
- 8. Served as the representative of the Mathematics and Statistics Department to the 1991, 1993, and 1995 MSU Scholar Recognition Days.
- Chaired a session at the Southeastern Atlantic Regional Conference on Differential Equations as well as helping with local travel arrangements, Starkville, Mississippi, October, 1991.
- 10. Mathematics and Statistics Department representative to the Federal Funding Opportunities Conference, Tuscaloosa, Alabama, August 1992.
- 11. Involved in the writing and grading of graduate core exams.
- 12. Coached the 1993 Mississippi State University Mathematics team for the 1993 Mississippi-Louisiana section Mathematical Association of America mathematics competition. The team was awarded first place.
- Chaired a session at the Mississippi State Annual Conference on Differential Equations and Computational Simulations as well as helping with local travel arrangements, Starkville, Mississippi, March, 1993.
- 14. Chaired a session at the Differential Equations Conference sponsored by Ohio University, Athens, Ohio, August, 1993.
- Coached the Mississippi State University Putnam Competition team 1993– 1997.
- 16. Coached the 1994 Mississippi State University Mathematics teams for the 1994 Mississippi-Louisiana section Mathematical Association of America mathematics competition. The teams took first and third place.
- 17. Supervised a Combination of Institutions Star-Search Scholar in her undergraduate research project during the summer of 1994.

- Chaired a session at the Southeastern Atlantic Regional Conference on Differential Equations, Knoxville, Tennessee, October, 1994.
- Worked with the Health-Science Enrichment Program since 1993, including giving summer 1994 and 1995 workshops on biological modeling using difference equations and Mathematica for rising 10th graders with Bonnie L. Oppenheimer.
- 20. Introduced the principal speaker at the 1995 Mississippi-Louisiana Section Mathematical Association of America meeting.
- 21. Coached the 1995 Mississippi State University Mathematics team for the 1995 Mississippi-Louisiana Section Mathematical Association of America mathematics competition. The team took first place
- 22. Introduced the principal speaker at the Mississippi State Second Conference on Differential Equations and Computational Simulations as well as helping with local travel arrangements, Starkville, Mississippi, March, 1995.
- 23. Coached the 1996 Mississippi State University Mathematics team for the 1996 Mississippi-Louisiana section Mathematical Association of America mathematics competition.
- 24. A model for batch tests, a talk for the Society of Black Engineers of Mississippi State University, Fall, 1996.
- 25. Coached the 1997 Mississippi State University Mathematics team for the 1997 Mississippi-Louisiana section Mathematical Association of America mathematics competition.
- 26. Co-coached the 1998 Mississippi State University Mathematics team for the 1998 Mississippi Louisiana section Mathematical Association of America mathematics competition. The team took third place.
- 27. Chaired a session at the Southeastern Atlantic Regional Conference on Differential Equations, Nashville, Teunessee, October, 1997.
- 28. Judged the 1997 Outstanding Instructional Paper Competition for the College of Engineering, Mississippi State University.
- 29. Named to the swine waste management research team, Fall, 1997.
- 30. Chaired a session at the Southeastern Atlantic Regional Conference on Differential Equations, Auburn, Alabama, October, 1998.
- Introduced the principal speaker at First Southern Symposium On Computing, University of Southern Mississippi, Hattiesburg, Mississippi, December 4-5, 1998.

- 32. Introduced the principal speaker Mississippi State Fourth Conference on Differential Equations and Computational Simulations as well as helping with local travel arrangements and chairing two paper sessions, Starkville, Mississippi, May, 1999.
- Chaired a session at the Southeastern Atlantic Regional Conference on Differential Equations, University of Richmond, Richmond, Virginia, October, 1999.
- 34. Faculty advisor for Mississippi State University College Democrats since Spring, 2001.
- Gave the Invocation at the Spring, 2001 Mississippi State University Graduation.
- 36. Mentored a summer undergraduate research student.
- 37. Taught at the MUW summer 2002 math camp middle and high school students.
- 38. Project NEXT consultant 2002-2004, 2006-2008
- 39. Since 2002, along with Donna Reese of Computer Science, I have reviewed and arranged reviews for mathematics and computer science proposals for the Ralph E. Powe Junior Faculty Award.
- 40. Served on a panel on the education of mathematics teachers at the MΛΛ Louisiana/Mississippi Section meeting, Clinton, MS March 2003.
- 41. Spoke at Sonya Kovalevsky High School Mathematics Day, 2003.
- 42. Gave lectures to the Summer, 2003 and 2004 REU students at Mississippi State University.
- 43. Taught at the MUW summer 2004 math camp middle and high school students.
- 44. Chaired a session at the Southeastern Atlantic Regional Conference on Differential Equations, Murray, KY, October 2007.
- 45. Introduced the principal speaker at the Mississippi State-UAB Seventh Conference on Differential Equations and Computational Simulations, Birmingham, AL, November 2007.
- Chaired a session at DIFFERENTIAL EQUATIONS WEEKEND, November 7, 2009, Memphis, Tennessee
- 47. Introduced the principal speaker at the Mississippi State-UAB ninth Conference on Differential Equations and Computational Simulations, Mississippi State University and served on the local organizing committee, October 2012.

REFEREEING AND REVIEWING

- Referee for the journals Applied Mathematics and Computation, The Journal of Hydraulic Engineering, The Electronic Journal of Differential Equations, Dynamic Systems and Applications, The Journal of Toxicology, Journal of Mathematical Analysis and Applications, and The Journal of Solar Energy Engineering. Discrete and Continuous Dynamical Systems, Applied Mathematics Letters, SIAM Journal of Math. Analysis, Applied Mathematics and Optimization, Nonlinear Analysis, and Natural Resource Modeling. I have also done refereeing work for The Water Resources Institute.
- 2. Serve as a reviewer for The Mathematical Reviews.
- 3. Serve as a textbook reviewer for publishers.

MEMBERSHIPS

- 1. American Mathematical Society
- 2. Society for Industrial and Applied Mathematics
- 3. Graduate Faculty at Mississippi State University
- 4. Mathematical Association of America (Mississippi vice-Chair for the Louisiana-Mississippi section 2004-2006, section chair 2006-2007)
- 5. Society for Mathematical Biology
- 6. OHALAH: Association of Rabbis for Jewish Renewal (Member of the finance committee since 2012)

COMMITTEES

- 1. Mississippi State University
 - (a) Departmental Committees
 - i. Undergraduate Curriculum Committee 1994 1996, and since 1999 (Chair 1994-1995, and 1999-2002)
 - ii. Graduate Student Recruiting Committee–I have traveled to various schools in order to recruit students. I have also obtained extradepartmental University funding for recruiting.
 - iii. Differential Equations Committee (including writing and grading graduate qualifying exams), since 1988
 - iv. Analysis Committee (including writing and grading graduate qualifying exams), since 1995–1999
 - v. Trigonometry Committee, Spring 1989
 - vi. Colloquium Committee, 1990-1994

- vii. Departmental Evaluation of Classroom Teaching Committee, 1995– 1998, 2002-2004.
- viii. Tenure and Promotion Committee, 1997-2000, 2003-2006 (chair, including rewriting the departmental document), 2006-to date (chair for three of those years).
- ix. Department Head search Committee, 1999-2000, 2006-2007
- x. Internal self-study committee, 2000-2001.
- xi. Screening Committee, since 2001.
- xii. Committee on the first two years, Fall, 2001-Spring 2003.
- xiii. Numerical Analysis Committee
- xiv. Linear Algebra Committee, (including writing and grading graduate qualifying exams), since 2003.
- xv. Assessment Committee, 2005-2009, 2013 to date
- xvi. Internal self-study committee, 2007-2008.
- committee on the Masters of Arts in Interdisciplinary Science, spring 2008 -2010(chair)
- (b) College Committees
 - i. College Ad Hoc Committee on Assessment
 - ii. Academic Excellence Committee 1996-1999
 - iii. Council of Advisors, since 1996. Vice-Chair 1999-2000, chair 2000-2001.
 - Search Committee for Dean of The College of Arts and Sciences, 2007-2008.
 - v. Founding member for the still being established Center for Earth Systems, Education, and Society, C(CS)².
- (c) University Committees
 - i. Steering Committee of the Mississippi Alliance for Minority Participation, for which I have designed and taught a summer bridge course for entering freshmen on finite difference equations, contributed to the tutoring program for MAMP students, and attended a two-day cultural diversity workshop in September, 1992.
 - ii. Speakers Series Advisory Committee, 1993-1994.
 - iii. Committee on the Masters of Arts in Teaching program.
 - iv. Committee for the Health/Science Enrichment Program, 1993-1995.
 - v. Founding Member of the Asian Studies Committee, Fall, 1996.
 - vi. Arts and Sciences Senator to the Holland (University-wide) Faculty Senate, 1997–2000, Chair of the Student Affairs Committee, 1998–2000.
 - vii. SACS subcommittee on admissions, Spring, 2001-Spring 2003
 - viii. Ad Hoc committee to select the university candidates for the 2005 Ralph E. Powe Junior Faculty Award.

- Search Committee for Graduate Dean and Associate Vice-President for Graduate Studies, 2006-2007.
- x. Search Committee for Dean of Students, 2009.
- xi. Committee on Undergraduate Research and Creative Discovery, since 2013.
- xii. Search Committee for joint Honors-Philosophy position, 2013-2014
- 2. Other Committees
 - (a) Steering Committee for the Southeast Atlantic Differential Equations Meeting, 1998-2001.
 - (b) Program Committee for the First Southern Symposium On Computing, University of Southern Mississippi, Hattiesburg, Mississippi, December 4-5, 1998.

ADVISING

- I have been advising undergraduate students at Mississippi Statc since 1988.
- My duties as ombudsman at The University of Texas included undergraduate advising.
- Helen Yang (Examination)-MS
- Charles Leslie Stewart (Project: The controllability of a batch test with competitive adsorption)-MS
- A. Sunshine Smith-Carroll (Project: A discrete predator-prey model)-MS
- Mark Riggs (Project: Recovery of a heat flux from a temperature profile)-MS
- Tess Weir Creel- MS (Project: A Discrete Spatially Varying Population Model, 2004)
- Sirisha L. Kala-MS (Doblurring images via partial differential equations, 2004)
- Ashley Gilliland-MS (A fisheries model, 2004)
- Jay Solavaram Srinivasan-MS (finite difference approach to a class of elementary optimal control problems, 2005)
- Jennifer Bell-MS (Kernel Integration Method for the Heat Equation, 2008)
- Yangyang Deng-MS (A PBPK model with feedback). 2010
- Bonnie Roberson (a nonlinear population model) 2013.

• Serve on several master's and Ph.D. committees in Mathematics and Statistics, various areas of Engineering, and Education, including several times as minor professor.

Rebecca Anne Wood

100 Little John Lane

Starkville, MS 39759

662-323-9295

RAnneWood@aol.com

Objective:

Seeking instructor position in lower Mathematics and Statistics courses

Education:

B. A. in Mathematics - Mississippi State University

M. A. in Statistics - Mississippi State University

Relative Experience:

Teaching Assistant – Mississippi State University (1989-1991)

- College Algebra
- Intermediate Algebra

Mathematics Instructor – East Mississippi Community College at Mayhew (1993-1994, full-time; 1996-1997, part-time)

- College Algebra
- Trigonometry
- Intermediate Algebra

Statistics Lecturer – Mississippi State University (Fall/Spring 2008-2009, part-time; Fall/Spring 2009-2010, part-time; Fall/Spring 2011-2012, part-time)

Introduction to Inferential Statistics

Statistics/Mathematics Lecturer – Mississippi State University (Fall/Spring 2012-2013, full-time; 2013-2014, full-time)

- Introduction to Inferential Statistics
- Structure of Real Numbers

Department service/ course committees

- Intro to Stats, Intro to Stat Inference(Chair); 2012-2013; 2013-2014
- Structure of Real Numbers, Problem Solving, Informal Geometry & Measure; 2012-2013; 2013-2014

Private Tutoring

College Algebra

Other Experience:

The Little Dooey Restaurant of Columbus, MS

• Manager with husband/owner

Volunteer Experience:

Junior Auxiliary of Starkville, MS

- Committee Chair
- Board member Finance Chair

Starkville Academy

- Treasurer for Starkville Academy Patrons Association (SAPA)
- Homeroom Mother

Social (college years):

- Kappa Delta Sorority Mississippi State University
- Pi Kappa Alpha Fraternity Little Sister Mississippi State University

Personal Information:

- Married to Barnett H. "Bart" Wood II
- Children Cole, age 19; Carter, age 15; Caroline, age 10
- Member of New Covenant Church of Starkville- Sunday School Teacher, Worship Team, Pianist, Children's Music, Women's Bible Study
- Resident of Starkville for 22 years



Mississippi University

for Women

A Tradition of Excellence for Women and Men

February 10, 2014

College of Education and Human Sciences Department of Education 1100 College St. MUW-1637 Columbus, MS 39701-5800 (662) 329-7175

> (662) 329-8515 Fax www.muw.edu

Mississippi Educator Licensure Commission C/O Gail Gettis Mississippi Department of Education P.O. Box 771 Jackson, MS 39205

Dear Educator Licensure Commission Members:

Please find enclosed a proposed listing of required courses for a Mississippi University for Women Institutionally Approved Supplemental Endorsement in Secondary Mathematics. This program has been developed by the mathematics faculty in collaboration with the education faculty, and in alignment with MAMTE recommendations. It was reviewed and approved by the MUW Department of Science and Mathematics faculty, and by the MUW Teacher Education Council.

We will be glad to provide additional information as needed.

Sincerely,

nefely Suth

Sue Jolly-Smith, PhD Dean, College of Education and Human Sciences

tem Micha

Thomas C. Richardson, PhD Dean, College of Arts and Sciences

muel

Bonnie Oppenheimer, PhD Professor of Mathematics & Associate Chair, Department of Science & Mathematics

Dionne Fortenberry, PhD Professor and Chair, Department of Science & Mathematics

Nou

Monica Riley, PhD Professor and Chair, Department of Education



Office of Teacher and Administrator Preparation Mississippi Department of Education 359 N. West Street/P.O. Box 771 Jackson, MS 39205-0771 601.359.3631

EDUCATION PROGRAM APPROVAL REQUEST FORM

 Institution:
 Mississippi University for Women
 Date Submitted:

 Submitted by:
 Sue Jolly-Smith, PhD
 Commission Approval Date:

 Dean, College of Education and Human Sciences
 State Board Approval Date:

Proposed Date of Program Implementation: Academic Year 2014-2015

Proposal Request and Support Materials are provided for the approval to implement: _____New Program _____X__Modifications to Existing Program _____Licensure Requirement

In addition to your <u>current education program course list/description</u>, you must provide: 1) a copy of the <u>proposed new program</u>; 2) the current program with <u>clear indication of proposed</u> <u>modifications</u>; 3) any <u>evidence of</u> institutions (state, regional or national) with the <u>same or a</u> <u>similar course of study</u>; 4) evidence of <u>qualified faculty</u>; and 5) any other documentation that further supports the proposal.

Please state your specific request:

Mississippi University for Women requests approval to offer an institutionally approved Secondary

Mathematics Supplemental Endorsement (Endorsement code 154)

Education majors often work toward additional certifications while they are working toward initial licensure, especially the Elementary Education candidates who earn coursework in two concentration (add-on endorsement) areas. The proposed program of study would ensure that those seeking an add-on endorsement to teach high school mathematics would have the advanced mathematical training required to meet the expectations of the *Common Core State Standards for Mathematics*. Our proposed

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 1 of 12

6-08

program is in line with the recommendations of the Mississippi Association of Mathematics Teacher Educators (MAMTE).

This program also aligns with the recently amended MDE policy for the Secondary Mathematics Supplemental Endorsement. The new program of study will include a specified 21 hours in mathematics rather than allowing candidates to select any 21 hours with a MA prefix. This revised program of study will better prepare teachers to present the mathematical concepts required in the Common Core State Standards for Mathematics which in turn will help Mississippi high school students be prepared for college or career.

NOTE: Program approval is subject to standard review procedures that involve several entities and, therefore, timelines for final approval by the Office of Teacher and Administrator Preparation (TAP) may vary. After TAP approves the program, if it is a new or modified program or requires licensure changes, it may then be subject to approval by the Licensure Commission on Teacher and Administrator Education, Certification and Licensure and Development and the State Board of Education before candidates are eligible for Mississippi Teacher Licensure.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 2 of 12

94



Request for Approval

Mississippi University for Women Institutionally Approved Secondary Mathematics Supplemental Endorsement

CONTENTS

- 1. Proposed New Program of Study
 - Proposed Program Requirements
 - Course Descriptions
- 2. The Current Program & Comparison with the Proposed Modifications
 - Current 21 Hour Add-On
 - Rationale for New Course Selection
 - MAMTE Recommendations
 - Summary Comparison of Proposed Program and MAMTE Recommendations
- 3. Other Similar Programs
 - Other Mississippi programs
 - Requirements for some other states within region
- 4. Evidence of Qualified Faculty
 - Listing of Mississippi University for Women Mathematics Faculty
- 5. Supporting Documentation
 - Course Syllabi
 - Vitae for Faculty
 - NCTM NCATE Standards
 - CBMS Recommendations

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 3 of 12

1. Proposed New Program of Study

The Mississippi University for Women A Tradition of Excellence for Women and Men

Mississippi University for Women Institutionally Approved Secondary Mathematics Supplemental Endorsement

Proposed Program Requirements

21-hour program of study requiring the following:

- Calculus
 - MA 181 Calculus I
 - o MA 182 Calculus II
- Advanced-Level Algebra

 MA 305 Linear Algebra
- Statistics
 O MA 123 Statistics
- Geometry
 - MA 112 Elementary Mathematics II
- Other Mathematical Training (Choose 6 credit hours from the following)
 - o MA 130 Precalculus
 - o MA 318 Mathematics for Secondary School Teachers
 - o MA 319 Materials and Methods in the Teaching of Secondary Mathematics

Note: All current Mississippi University for Women transfer equivalency agreements will be honored as they relate to this program of study.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 4 of 12

COURSE DESCRIPTIONS (full syllabi are included in section 5)

MA 112 - Modern Elementary Mathematics II (Credits: 3)

Statistics, probability, measurement, informal geometry including congruence, constructions, similarity, transformations, and coordinate geometry.

Note: Required of all majors in elementary or special education.

MA 123 – Statistics (Credits: 3)

An introduction to basic applications of descriptive and inferential statistics: organizing data, mean, median and mode, and standard deviation, boxplots, probability and discrete random variables, the binomial distribution, the normal distribution, sampling distribution of the mean, confidence intervals and hypothesis tests for one population mean, the chi-square distribution.

MA 130 – Precalculus (Credits: 3)

Prerequisite: ACT math subscore of 22 or higher, or MA 113 with C or better.

This course will cover functions and their graphs, including polynomial and rational functions, trigonometric functions, and exponential and logarithmic functions; systems of equations; and sequences and series. Emphasis will be placed on knowledge, skills, and techniques needed in higher level mathematics courses such as Calculus I.

MA 181 - Calculus I (Credits: 3)

Prerequisite: ACT Math Subscore of 24 or higher, or MA 113 and 114 with C or better.

A thorough treatment of differential calculus including the concepts of limits, continuity, derivatives, and applications of derivatives.

MA 182 - Calculus II (Credits: 3)

Prerequisite: MA 181

A thorough treatment of integral calculus including Riemann sums, applications of integrals, and techniques of integration, as well as the calculus of transcendental functions.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 5 of 12

MA 305 - Linear Algebra (Credits: 3)

Prerequisite: MA 182 with a C or better

Systems of linear equations, vectors, matrices, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, and applications.

MA 318 - Mathematics for Secondary School Teachers (Credits: 3)

Prerequisite: MA 113 and one additional mathematics course numbered above MA 113.

To prepare education majors to teach mathematics at the middle school or secondary level, this problem-based course will examine topics from the secondary school mathematics framework from an advanced perspective.

Note: This course is required for the mathematics secondary education major and cannot be used as an upper-level elective for the mathematics major or mathematics minor.

MA 319 - Materials and Methods in the Teaching of Secondary Mathematics (Credits: 3)

Prerequisite: Admission to Teacher Education Program Required of all mathematics majors who will be licensed in secondary mathematics

Brief history of mathematics, objectives of the teaching of mathematics, consideration of topics that are or should be included in mathematics courses for junior and senior high school, a survey of instruction and technology in mathematics, and the use of these teaching techniques in specific teaching-learning activities. A minimum of ten hours of field experience beyond observation is required.

Note: This course is required for the mathematics secondary education major and cannot be used as an upper-level elective for the mathematics major or mathematics minor.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 6 of 12

2. The Current Program & Comparison with the Proposed Modifications

Previous MDE approved 21 hour add-on supplemental endorsement:

According to previous MDE guidelines, a teacher candidate was required to take and pass with a C any 21 hours of mathematics courses, including mathematics methods courses offered in the education department. Teacher candidates in the MUW Elementary Education Program are required to take:

MA 111 Modern Elementary Mathematics I MA 112 Modern Elementary Mathematics II ED 305 Teaching Mathematics in Elementary and Middle Schools

Candidates could select any additional 4 courses to complete the 21 required hours and often chose:

MA 113 College Algebra MA 114 Trigonometry MA 123 Statistics MA 130 Precalculus

Thus, candidates under the previous guidelines could be licensed to teach 9-12 mathematics without ever encountering a course in calculus. We are recommending that the previous plan (any 21 hours of mathematics credit, including ED 305, MA 111 and 112) earn licensure to teach mathematics up to 8th grade, without institutional recommendation, as set forth by MDE, and that the MUW Institutionally Approved Secondary Mathematics Supplemental Endorsement be used for licensure 9-12.

Rationale for New Course Selection

The courses in the Mississippi University for Women Program of Study for the Secondary Mathematics Supplemental Endorsement were chosen in order to provide preservice teacher candidates with the mathematical content knowledge necessary to be effective secondary mathematics teachers. These courses are in line with recommendations from the **Mississippi Association of Mathematics Teacher Educators** (MAMTE) and the **National Council of Teachers of Mathematics** (NCTM) NCATE Standards, (A copy is attached in section 5, and can also be found on the NCTM website: <u>http://www.nctm.org/uploadedFiles/Math_Standards/NCTM%20NCATE%20Standards%202012%20</u> <u>Mathematics%20Content%20-%20Secondary03.06.13.pdf</u>). The courses also align with the recommendations outlined by the **Conference Board of the Mathematical Sciences** (CBMS), also provided in section 5 of this document.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 7 of 12

MAMTE Recommendations for Secondary Mathematics Supplemental Endorsement from the MAMTE Symposium May 2012 (as revised by the MDE Licensure Subcommittee July 2012)

Hours	Course Type	Notes		
6 Calculus		Minimum number of hours: MAMTE strongly suggests that these hours not include precalculus		
3	Geometry			
3	Statistics			
3	Advanced Algebra course	Linear Algebra Abstract Algebra		
6	Electives (300+ level: Calculus III, Calculus IV, Elementary Functions/Precalculus; or Secondary Mathematics Methods Course)	Suggestions: MAMTE strongly suggests a Foundation of Math course and a Methods course		

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 8 of 12

Summary Comparison of the Proposed MUW Supplemental Endorsement for Mathematics for Secondary School Teachers with the MAMTE Recommendations.

MUW Proposed Course Requirements		MAMTE	MAMTE Course Type	Notes
MUW Courses	MUW Credit Hours	Recommended		
		Credit Hours		
Calculus:			Calculus	Minimum number of
 MA 181 Calculus I 	3			hours: MAMTE
MA 182 Calculus II	3			strongly suggests that
				these hours not
and the second sec	6 (calculus total)	6		include precalculus
Geometry	3	3	Geometry	
 MA 112 Elementary Mathematics II 				
Statistics	3	3	Statistics	
MA 123 Statistics				
Advanced-Level Algebra	3	3	Advanced Algebra	Linear Algebra
 MA 305 Linear Algebra 			course	Abstract Algebra
Other Mathematical Training (Choose 6 credit	6	6	Electives (300+ level:	Suggestions:
hours from the following)			Calculus III, Calculus	MAMTE strongly
 MA 130 Precalculus 			IV, Elementary	suggests a
 MA 318 Mathematics for Secondary 			Functions/Precalculus;	Foundation of Math
School Teachers			or Secondary	course and a Methods
• MA 319 Materials and Methods in the			Mathematics Methods	course
Teaching of Secondary		00	Course)	
Mathematics				
Total Credit Hours	21	21		

Special notes regarding comparison:

MUW has both a Secondary Mathematics Content (MA318) course, and a Secondary Mathematics Materials and Methods (MA 319) course. These are offered in alternating fall semesters. MA 318 Mathematics for Secondary School Teachers has a MA 113 College Algebra prerequisite. This prerequisite would be changed to allow for any two mathematics classes, MA 113 or higher, to count as the prerequisite for any students working towards the Secondary Mathematics Supplemental Endorsement. However, the methods course is restricted to those students who have been accepted to the Teacher Education Program. Requiring both of these courses might delay graduation of transfer students by a full year. Hence, a candidate may use whichever one fits best into the student's schedule, with precalculus (with its three-week section of trigonometry) as an alternative. The precalculus course may also help students who may not be prepared to enter MA 181Calculus I. Our MA 303 Modern Geometry course is mostly non-Euclidean geometry, and hence not suitable for high school geometry instruction. The MA 112, however, presents the geometry concepts most critical for high school teachers.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 9 of 12

3. Other Similar Programs

The University of Mississippi, Delta State University, and Mississippi Valley State University are among recently approved universities offering the new Secondary Mathematics Supplemental Endorsement.

For example, this is the program of study for the University of Mississippi:

21-hour program of study requiring the following:

- Calculus (choose 6 credit hours from the following):
 - MATH 261 Unified Calculus and Analytic Geometry I
 - MATH 262 Unified Calculus and Analytic Geometry II
 - o MATH 263 Unified Calculus and Analytic Geometry III
- Advanced-Level Algebra

 MATH 319 Introduction to Linear Algebra
- Statistics
 - MATH 115 Elementary Statistics
- Geometry
 - o MATH 390 Techniques in Teaching Secondary Level Math
- Trigonometry • MATH 123 Trigonometry
- Discrete Mathematics
 MATH 301 Discrete Mathematics

Note: All current University of Mississippi transfer equivalency agreements will be honored as they relate to this program of study.

Listed following are the Secondary Mathematics Supplemental Endorsement criteria for some other states in the Southeastern United States.

Arkansas

(http://arkansased.org/educators/licensure/adding_licensure.html)

- o Passing content area Praxis score, AND;
- University program of study (For example: University of Arkansas (<u>http://coehp.uark.edu/Mathematics ALP.pdf</u>)
 - 21 hours in math including
 - College algebra

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 10 of 12

- Calculus
- Geometry
- 2 math electives (any level)
- 2 math electives (3000-4000 level)

South Carolina

(http://ed/sc/gov/agency/se/Educator-Certificatioh-Recruitment-and-Preparation/Certification/documents/TeacherCertificationManual.pdf)

- o Passing content area examination score, AND;
- o 26 hours in math outlined by state department including:
 - o 6 hours of algebra (abstract, matrix, and linear)
 - o 3 hours of geometry
 - o 8 hours of calculus
 - 9 hours of math electives (probability, statistics, applied math, discrete math, number theory, analysis, advanced algebra, advanced geometry)

Tennessee

(http://www.tn.gov/education/lic/add.shtml)

- Passing content area Praxis score AND completion of a university program (For example: Tennessee Technical University <u>http://www/tntech.edu/files/teachered/math_add.pdf</u>)
 - o 22 hours in math including:
 - Calculus
 - Matrix algebra
 - Concepts of math
 - Geometry
 - Statistical methods
 - History of math
- OR Passing Praxis content area examination score (only for those teacher who currently hold a 7-12 license in another area)

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 11 of 12

4. Evidence of Qualified Faculty

The Mississippi University for Women Department of Sciences and Mathematics employs qualified full-time faculty to teach the mathematics courses outlined above. Currently, these faculty members include:

- Dr. Agnes Carino, Assistant Professor of Mathematics (Ph.D. Mississippi State University) Dr. Carino is a full-time member of the Department of Sciences and Mathematics. She is likely to teach MA 130, MA 181, MA 182, or MA 305.
- **Dr. Susan Ficken**, Assistant Professor of Mathematics (Ph.D. Northern Illinois University) Dr. Ficken is a full-time member of the Department of Sciences and Mathematics. She is likely to teach MA 130, MA 181, MA 182, or MA 305.
- Dr. Joshua Hanes, Assistant Professor of Mathematics (Ph.D. University of Mississippi) Dr. Hanes is a full-time member of the Department of Sciences and Mathematics. He is likely to teach MA 130, MA 181, MA 182, or MA 305.
- **Dr. Dorothy Kerzel**, Professor of Mathematics (Ph.D. Washington State University) Dr. Kerzel is a full-time member of the Department of Sciences and Mathematics. She is likely to teach MA 123, MA 130, MA 181, MA 182, or MA 305.

Dr. Bonnie Oppenheimer, Associate Chair of the Department of Sciences and Mathematics, Professor of Mathematics (Ph.D. University of Texas at Austin)

Dr. Oppenheimer is a full-time member of the Department of Sciences and Mathematics. She is likely to teach MA 112, MA 123, MA 130, MA 181, MA 182, MA 318, or MA 319.

5. Supporting Documentation

Syllabi for the courses in the **MUW Secondary Mathematics Supplemental Endorsement** and 2page vitae for the faculty members in the Department of Sciences and Mathematics are included. The NCTM and CBMS recommendations are also provided in this section.

MUW Proposal for Supplemental Endorsement for Mathematics for Secondary School Teachers Page 12 of 12

MA 112 Modern Elementary Mathematics II

Dr. Bonnie Oppenheimer Office: 106B Parkinson Hall Spring Phone: 329-7239 2014 E-mail: boppenheimer@as.muw.edu 3 semester hours Section 001: 8-8:50 a.m. Section 002: 9-9:50 a.m. Parkinson Hall 216

Office Hours

My office hours will be held in Parkinson 216 on Mondays, Wednesdays, and Fridays 10:00-11:00 a.m.; and Tuesdays and Thursdays from 9:00-10:00 a.m. If my announced office hours are not convenient for you, feel free to call or e-mail me to arrange an appointment at our mutual convenience, or stop by my office to see if I am in. (I keep my office door closed; you can't tell I am in my office unless you knock loudly.) If I am already working with another student, let me know that you wish to speak with me. If your needs mesh, I might want to work with both of you at the same time. We can usually find a time to meet that will suit both of our busy schedules. I should always be the first person you come to with your questions. The Center for Academic Excellence will provide a free tutor for this class (Jenna Petrel), but you must go to the Center in Reneau and sign up for tutoring first. The review session schedule will be announced shortly. Victoria Richardson will also tutor for pay; contact her directly at 356-9022 or creaturebond25@yahoo.com.

Nature of Course Content/Course Description

MA 112 is designed to give students a survey of the mathematics that will be needed in order to teach in elementary school or in special education classes, and is required of all majors in elementary or special education. Modern Elementary Mathematics II studies geometric figures, measurement, geometric transformations, congruence, constructions, similarity, statistics, probability, and coordinate geometry as time permits. This course is a survey of these topics, but sufficient time is spent on each topic to ensure that the student can teach the basics. This is not a methods course, but different methods for teaching these topics will be discussed. Students will be encouraged to analyze the material to make it fit the needs of each particular age group. A positive attitude towards mathematics is stressed. Teachers need to understand mathematics, see how useful and practical it can be, and enjoy it.

Textbook, Lecture Manual, and Manipulative Kit

There are three required components for this course, two of which are available in the bookstore:

- 1) Mathematical Reasoning for Elementary Teachers, 6th Edition by Calvin T. Long, Duane W. DeTemple, and Richard S. Millman, Addison Wesley. (Chapters 9-14 will be covered as time permits.)
- 2) The lecture manual is required for this course, and is posted on Blackboard. All homework assignments, vocabulary, writing assignments, and journal prompts may be found in your lecture manual or in Blackboard.
- 3) Purchase of the manipulative kit is a class requirement. You may not purchase this kit from some other student. I will assume you have this kit available when I

choose homework assignments. This kit will be used in MA 111, MA 112, and ED 305 as well. You can use the materials when you set up an activity center during your field experiences, when you tutor, and when you student teach. Keep your manipulative kit at home, to use for homework assignments. You will be asked to bring your percent protractors, and compasses to class at various times this semester.

Other Required Material

We have scissors, tape, and markers for the lab, but if you can bring your own scissors, and colored pencils or markers to class every day, the activities we do that need those supplies will be expedited.

Journals: You will need a small notebook to use as a journal for me. Please, no three-ring binders. (You may continue to use the one from last semester, if you still have room.) You will be handing this journal in once every week, so it needs to be separate from your class notes and homework papers. The day your journal is due each week is stated in the tentative schedule for the course, in the lecture manual. I will show you where to turn in your journal in Parkinson 216, in class. If you forget to turn in your journal during class, I will still accept it without penalty anytime that calendar day. Otherwise, wait until your next journal turn-in day. Put your journal in the file holder on the top shelf of the bookcase outside my Parkinson 106B office, if you didn't turn it in during class. (Please don't try to make your journal fit under my office door.) Journals will be graded solely on timely responses, not on content, grammar, or correctness of responses. Please put no more than 2 entries per page, so I have room to respond to your thoughts. All journal prompts are in your lecture manual. Every student responds to every prompt.

Assigned Readings

Your lecture manual lists the day(s) we will be discussing a particular section in your text. Please read the section and fill in definitions for the vocabulary words BEFORE coming to class for the discussion of that section. You will also have three articles from recent issues of *Teaching Children Mathematics* to read and respond to in some fashion.

Writing Assignments

The best way to show you how "Writing Across the Curriculum" works is to demonstrate it in a mathematics class. Plagiarism will be discussed in class. Please be sure you know what plagiarism is, and avoid it at all costs. The writing assignments should be in your own words. If you'd like to use the author's words, use quotation marks around them and cite the page number where you found those words. Tutors are in the Writing Lab (or ask me) if you are not sure how to reference words that are not yours. I will notify the Early Alert Coordinator if you fail the first Writing Assignment, or if you plagiarize on it. Tentative due dates are listed on the tentative schedule. Writing assignments will be accepted all day long on the due dates:

Writing Assignment #1 due 2/14/14 Writing Assignment #2 due 3/14/14 Writing Assignment #3 due 4/16/14

Desired Student Goals and Outcomes InTASC Model Core Teaching Standards: April 2011

The goals for this course are linked to the InTASC Standards, which may be found in their entirety at the end of this syllabus.

Standard #4: Content Knowledge: The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

All students must take mathematical content tests over central concepts and mathematical structures. Save your tests to use as artifacts for this standard.

Extra Credit

There will be no extra credit in this course. This is not to say that a test may not have extra credit questions on it. Work hard to achieve and maintain the grade you want out of the course through the regular assignments and tests that are given. Please be sure that you understand any corrections that are made to your homework before the test over that material. Please make sure you understand corrections to your test responses before the final exam. Feel free to discuss with me any questions you may have in my office hours or make an appointment with me at our mutual convenience. Knock when you arrive. (I keep the door closed because my back is to the door.)

Homework

Homework will be assigned at each class meeting. In the lecture manual, the homework is listed on the day it is assigned. Homework will be collected at the next class meeting, and will be graded on the effort shown. (4 = all problems attempted; 3 = almost all problems attempted; 2 = about half done; 1 = just started; 0 = no paper) Homework is DUE at the beginning of each class and WILL NOT be accepted after the class time for any reason. Homework will never be accepted late, even if you were absent the day it was due. I will be happy to review a missed assignment for you, so that you are sure you understand the material you missed. There will be three drop homework grades to account for any emergencies. If you miss a class, all assignments for Spring 2014 are in the lecture manual. Please come prepared with the assigned homework from the class day you missed. I will notify the Early Alert Coordinator after your fourth missing assignment through midterm.

Requirements of the Course/Method of Evaluation/Makeup Policy

Four tests (50%), a journal (5%), homework (10%), three writing assignments (10%), and a comprehensive final exam (25%) will determine your semester grade. A tentative schedule is included in your lecture manual. You must meet the Department of Sciences and Mathematics' attendance policy (detailed in its own section). There will be no makeup tests: A grade of zero will be assigned for each missed test. If you need to leave a test for any reason, the test will be turned in and scored as is. I will notify the Early Alert Coordinator if you fail the first and/or the second test. The final exam percentage may be used to replace your lowest test score, if it helps you to do so. **Homework will never be** <u>accepted late, even if you were absent the day it was due</u>. I will drop your three lowest homework grades. You must have a C or above in this class and in MA 111, and be admitted to the Teacher Education Program, before you may take ED 305.

Attendance Policy

Students must attend at least 70% of the classes in a Department of Sciences and Mathematics course. This means you may have a maximum of 12 absences. I will notify the Early Alert Coordinator after your third absence until midterm. In order to receive credit for this course, a student must have at least a 65 average, and must have attended at least 70% of the classes. The Teacher Education Program requires at least a 74 in this class and in MA 111 (and admittance to the TEP) before you may take ED 305. (You do not need to pass MA 112 before taking MA 111. You do not need to pass MA 111 before taking MA 112.)

Cultural Diversity

Mathematics is the great equalizer. It is the belief of the National Council of Teachers of Mathematics that all students can learn mathematics.

Disabilities Statement

It is the responsibility of students who have professionally diagnosed disabilities to notify the instructor so that necessary and appropriate modifications can be made to meet any special learning needs.

Early Alert Program

As one part of the academic early-alert program, students who perform poorly at midterm (falling below a midterm semester GPA of 2.0) will have holds placed on their accounts. The early-alert holds for poor midterm performance serve, not as a punitive measure, but rather as an opportunity for students to seek the advice of their faculty advisors at a crucial moment in the semester. Students who have early-alert holds on their accounts for poor midterm performance should schedule meetings with their faculty advisors, who will work with the students to draw up action plans for academic success. Once those plans are in place, the early-alert holds for poor midterm performance will be released.

Academic Dishonesty

Please check the Student Handbook sections on "Academic Information" and "Student Rights and Responsibilities." MUW is known for its high academic standards, ideals, and traditions. Each student in MA 112 is expected to uphold this code: "I pledge myself to uphold the highest standards of honesty in all phases of university life both alone and with many and accept my responsibility for helping others to live up to such standards. All this I will do that my University may become greater, better, and more beautiful than when I entered it."

Grading Scale

A 92-100 B 83-91 C 74-82 D 65-73 F Below 65

Topics in the Order They Will be Covered; Tentative Test Dates and Topics **Geometric Figures** Figures in the Plane Curves and Polygons in the Plane Figures in Space Networks Test #1: Friday, January 31, 2014 Measurement: Length, Area, and Volume The Measurement Process Area and Perimeter The Pythagorean Theorem Volume Surface Area Test #2: Friday, February 21, 2014 Transformations, Symmetries, and Tilings **Rigid Motions and Similarity Transformations** Patterns and Symmetries Tilings and Escher-Like Designs Congruence, Constructions, and Similarity Congruent Triangles **Constructing Geometric Figures** Similar Triangles Test #3: Friday, March 28, 2014 Statistics: The Interpretation of Data Organizing and Representing Data Measuring the Center and Variation of Data Statistical Inference Probability **Experimental Probability** Principles of Counting Permutations and Combinations Theoretical Probability Test #4: Wednesday, April 30, 2014 Final Exam: 8-11 a.m. Thursday 5/8/14 for the 8:00 class (MA 112-001) 8-11 a.m. Tuesday 5/6/14 for the 9:00 class (MA 112-002)

Technology

Manipulatives of all kinds may be used in this course, including graphing calculators. We use a classroom set of Math Explorer calculators. We will spend a day in the computer lab, using *Geometer's Sketchpad*. Appendix C in your text is an introduction to *Geometer's Sketchpad*. You may take the opportunity to become familiar with the software before the activity. Look under Applications for a program called GSP.

Educator as Reflective Decision Maker

Every attempt will be made to approach this course in such a way that the students see the types of decisions required to choose between different teaching techniques. Students

109

should become familiar with the common manipulatives used in the topics in this course, and be able to justify using one over another for a particular topic. Hence, this course is congruent with University goals and the theme of the teacher education unit: "The Educator as a Reflective Decision Maker."

A Brief Bibliography for Knowledge that Supports this Conceptual Framework

Burbaker, D. & Simon, L. (1993). Teacher as decision maker. Newbury Park, CA: Corwin Press, Inc.

National Council of Teachers of Mathematics. (2000). Principles and standards for school mathematics. Reston, VA: NCTM.

These and other NCTM Yearbooks:

Multicultural and Gender Equity in the Mathematics Classroom (1997); Mathematics in the Middle Grades (5-9). (1982); Calculators in Mathematics Education (1992); Computers in Mathematics Education (1984); Teaching Statistics and Probability (1981); Learning and Teaching Geometry, K-12 (1987)

NCTM and AMTE Journals

Teaching Children Mathematics Mathematics Teaching in the Middle School Journal for Research in Mathematics Education Journal of Mathematics Teacher Education

InTASC Model Core Teaching Standards: April 2011

Standard #1: Learner Development: The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive. linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard #2: Learning Differences: *The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.*

Standard #3: Learning Environments: The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.

Standard #4: Content Knowledge: The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5: Application of Content: *The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.*

Standard #6: Assessment: The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Standard #7: Planning for Instruction: The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Standard #8: Instructional Strategies: The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Standard #9: Professional Learning and Ethical Practice: *The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.*

Standard #10: Leadership and Collaboration: The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

Dr. Oppenheimer's Philosophy About MA 112

Nationwide, there has been a debate in the mathematical community to explain the general lack of enthusiasm that occurs when one mentions mathematics. Three groups of people have been identified to help students regain an enthusiasm for mathematics: elementary teachers, secondary mathematics teachers, and the college faculty who train the preservice teachers at both levels. (Recognize yourself in that list? I do!)

Teachers who cannot answer "Why?" about the mathematics they are presenting, teachers who themselves make mistake after mistake in their board work in front of their students, and teachers who lecture and pass out worksheets as the sole way mathematics is presented are listed among the top reasons why students have lost their innate fascination with mathematics. Elementary school teachers who are math anxious also have been found to create students with math anxiety.

If you recognize yourself as being math anxious, this course is designed to help you feel comfortable with the material you will be presenting as you join the teaching profession. We will always explore the "Why?" for each topic we encounter, and we will usually take the topics a little beyond what you would actually need at the K-8 level. You need to know the subject matter well yourself to be able to present it understandably to children who are hearing it from you for the very first time. A deeper understanding of mathematics beyond the grade level you teach will help you choose among the approaches you can use to clarify misunderstandings.

Practice being precise in your thinking – a single word can make a difference in how the children perceive the information you present. Everything you turn in to me will be thoroughly examined for the slightest misunderstanding that should be corrected before you stand in front of your own classroom. You won't have to wonder if you are saying things correctly; you'll know you are!

Write in complete sentences that are grammatically correct and have correct capitalization and correct punctuation, in your homework and on tests, and strive to do so in your journal responses. Please feel free to discuss this requirement with me during office hours or at your convenience. Common usage mistakes can be corrected by a visit or two to the Writing Lab (so you don't lose points for that kind of mistake again).

I should always be the first person you come to for help in MA 112, but if my office hours are not compatible with your schedule, please make an appointment outside of my office hours for additional help. You can also take advantage of the Center for Academic Excellence in Reneau (sign up now for free tutoring help) or pay a tutor.

My goal is to have you become the best elementary teacher you can possibly be. I would hope that would also be your goal as you work through these two mathematics content courses. I want to support you in your effort to achieve that goal with all the help I can possibly give. Please let me know if I'm not giving you the kind of support or feedback that you need. Good luck this semester and here's to your best effort!

Dr. Oppenheimer

112
Math 123 Statistics / Sections 001, 002, 003 / Spring 2014

Dr. Dorothy Kerzel Office: Parkinson Hall 201A Phone: 329-7330 E-mail: dakerzel@muw.edu

8

Class times:	MA 123-001	Mon & Wed	2:00-3:15	Parkinson 104
	MA 123-002	Tues & Thur	8:00-9:15	Parkinson 104
	MA 123-003	Tues & Thur	9:30-10:45	Parkinson 104

Office hours: Monday 12:30-1:30 Tuesday 2:00-3:30 Wednesday 11:00-1:00 Thursday 2:00-3:30

Feel free to drop by my office at other times, as I am in or around my office more than just during office hours. Also, I am always willing to arrange appointments.

- Text: Elementary Statistics, by Neil Weiss, 8th edition (printed textbook is optional) MyStatLab access (required)
 - 1. You must purchase the MyStatLab (or MyMathLab) access for this course. It is your choice whether you purchase a printed textbook or not. Problems and figures from the textbook will be referenced during class. But you have access to the entire textbook from within MyStatLab.
 - 2. Note that if you cannot immediately purchase your access, then you can obtain a temporary access to MyStatLab via the Pearson website which will allow you to use MyStatLab for a short time (2 weeks, I think) until you purchase your own access.
 - 3. If you have previously used MyStatLab for MA 123 Statistics, then you should be able to use your previous MyStatLab account.

4. If you have used MyMathLab in a course other than MA 123, you will need a new access code, since your registration is course specific.

Prerequisite: None, though basic mathematics skills and calculator use will be needed.

Other required materials: Access to a computer with internet and a calculator

Content: Organizing data, descriptive measures, probability, normal distributions, sampling distribution of the mean, confidence intervals, hypothesis tests for population means, Chi-square hypothesis tests, regression lines, and correlation coefficients will be covered. This will be the following chapters, covered in the order listed:

- Chapter 1 The Nature of Statistics
- Chapter 2 Organizing Data
- Chapter 3 Descriptive Measures
- Chapter 5 Probability and Random Variables
- Chapter 6 The Normal Distribution
- Chapter 7 The Sampling Distribution of the Sample Mean
- Chapter 8 Confidence Intervals for One Population Mean
- Chapter 9 Hypothesis Tests for One Population
- Chapter 12 Chi-Square Procedures
- Chapter 4 Descriptive Measures in Regression and Correlation

Desired Student Goals and Outcomes: After successful completion of the course, the student should be able to:

- 1. distinguish between descriptive and inferential statistics;
- 2. understand and distinguish between sample and population;
- 3. understand and describe basic sampling methods;
- 4. use and create charts, tables, diagrams, and graphs summarizing information;
- 5. understand and calculate the descriptive summary statistics;
- 6. understand and apply basic probability concepts and rules;
- 7. understand and apply z-scores and the standard normal distribution;
- 8. understand and use the sampling distribution of the sample means;
- 9. use the Central Limit Theorem;
- 10. understand and calculate confidence intervals for means;
- 11. understand and apply hypothesis tests for means (z-test, t-test);
- 12. understand and perform Chi-square goodness-of-fit and Chi-square independence test;
- 13. understand and calculate regression lines and correlation coefficients; and
- 14. use of technology appropriately.

My Philosophy on Learning Mathematics:

The primary goal in this course is for you, the student, to learn. I will work hard to help you learn, but the key ingredient needed for success is your own hard work. Here are some thoughts to keep in mind:

- Mathematics is not a spectator sport. You will not learn to do mathematics by merely watching someone else do mathematics. You must be active yourself, asking questions, working problems, and understanding concepts.
- Learning mathematics requires more than just doing problems and getting the "right" answer. You need to understand the concepts and methods, as well as when and why to use them, and how to put them together to solve complicated problems.
- Asking questions about mathematics is a useful skill to develop. Ask yourself questions when you are studying, ask your classmates questions when you study together, and ask me questions in class or in my office.
- Reading a mathematics book is not like reading a history book or a piece of literature. It is slow reading, often requiring several tries before it starts to make sense. Reading with paper and pencil (and using them to work out examples) is usually more effective than without.
- Working carefully all the time will reduce careless errors. Work carefully the first time on a problem and don't rely on MyStatLab to tell you if you need a second try. You will only have one shot on the exams.
- Practice with concepts and methods is an essential component for successfully completing this course. Various assignments will be made through out the semester. The goal is for you to learn by doing and to keep up with your work, as it is very difficult to catch up on a large block of material in a short period of time, such as before an exam.
- To be successful in this course you will need to work hard. Along the way, I will work hard, you will learn a lot, and you will get lots of help if you seek it out.

Course Requirements: The student is expected to:

- attend and participate in all class meetings (there is no substitute for being in class, hearing and seeing);
- read the text (either printed or online in MyStatLab);
- complete all assignments;
- take all quizzes;
- take and pass all scheduled exams and the comprehensive final exam.

Methods of Evaluation and Grading Information:

3 exams	_	45%
Homework		25%
Quizzes		5%
Comprehensive final		25%

Exam dates are

Section 001: Feb 12, Mar 12, Apr 23; final Wednesday, May 7, 3:00-6:00 Section 002: Feb 11, Mar 13, Apr 24; final Wednesday, May 7, 8:00-11:00 Section 003: Feb 11, Mar 13, Apr 24; final Monday, May 5, 8:00-11:00 Exams will include the material covered up to the exam date. The final exam is comprehensive and under no circumstances will the final exam be given at an earlier time.

• Homework assignments will typically be given for each section covered and there will be periodic quizzes, with most (but not all) homework and quizzes in MyStatLab. It is the student's responsibility to purchase an access code and register for the appropriate section within MyStatLab. It is also the student's responsibility to frequently check MyStatLab for assignments and quizzes, as they will be posted throughout the semester.

• Assignments in MyStatLab will be due at the times designated for each assignment in the software. Allow yourself sufficient time to complete your work before the deadline. Any written assignments are due at the beginning of class on the table at the front of the room, stapled if there are multiple pages. All work that you complete must be your own work. I encourage you to study and work with your classmates as you do homework and learn. What you submit needs to be your own effort. That means that you do not just look at someone else's work, say "oh yeah", and copy it. That is plagiarism which will be reported and go on your record. Remember that your instructor is your best resource for assistance with this class. All assignments will be graded for correctness, completeness, and presentation.

- No late assignments will be accepted for any reason. Due dates are firm for all assignments, including those in MyStatLab. If you must miss class, your assignment still needs to be submitted on time. There will be no make-up quizzes or exams. Any missed assignment, quiz, or exam will be recorded as a zero. Your final exam score can replace one exam score in the case that your final exam score is higher than your lowest exam score (zeros for missed exams included; zeros for cheating excluded).
- Final grades will not be stricter than the common 90-80-70-60 scale, so A 90-100; B 80-89; C 70-79; D 60-69; F 0-59.

<u>Calculators</u>: You will need a calculator for basic calculations. But you may *not* use a calculator with symbolic capabilities (such as the TI-89 or TI-NSpire) nor calculators on cell phones or PDAs.

<u>Classroom Behavior</u>: All cell phones, iPods, and other electronic devices must be turned off during class and be put out of sight in your backpack, purse, etc. Your phones or other electronic devices cannot be out on your desk and you definitely are not to be texting under the desk. Any students violating these rules will be asked to leave the class for the remainder of the day and counted absent, including while taking an exam. You are expected to arrive on time, be ready to begin class at the specified class time, and not be disruptive during class.

Attendance, Tardiness, and Drop Dates: An attendance rate of 70% is required to receive a passing grade, meaning that you may miss at most nine classes. This is a policy of the Department of Sciences and Mathematics. Repeated late arrivals to class are a distraction to the instructor and other students. If lateness is a persistent problem, then I will lock the classroom door at the start of class. Please be aware of important dates on the Academic Calendar, including the drop deadlines of February 10 (last day to drop without penalty grade) and April 15 (last day to drop with WP or WF). Note that failure to attend class does not constitute withdrawal from a course.

<u>Use of Blackboard and MyStatLab</u>: Homework and quizzes are planned to be in MyStatLab. You are required to purchase the appropriate access code and "register" for the appropriate section in MyStatLab. Information on accomplishing this will be provided in class. Some information related to the course will be posted in Blackboard throughout the semester. This will include the syllabus, information on registering in MyStatLab, exam solutions, and other information as necessary. It is each student's responsibility to check Blackboard on a regular basis.

<u>Early Alert Program</u>: As one part of the academic Early Alert Program, students who perform poorly at midterm (falling below a midterm semester GPA of 2.0) will have holds placed on their accounts. The early alert holds for poor midterm performance serve, not as a punitive measure, but rather as an opportunity for students to seek the advice of their faculty advisors at a crucial moment in the semester. Students who have early alert holds on their accounts for poor midterm performance should schedule meetings with their faculty advisors, who will work with the students to draw up action plans for academic success. Once those plans are in place, the early alert holds for poor midterm performance will be removed.

<u>Disability Statement</u>: The university does not discriminate on the basis of disability. Reasonable accommodations will be made for any student with a documented disability. Students in need of special accommodations due to a disability are encouraged to speak with me as soon as possible, so that I can ensure all student needs are met. The student should also contact the Disability Services Coordinator in the Center for Academic Excellence.

<u>Academic Dishonesty</u>: A last topic, which I hope does not arise in this course, is that of academic dishonesty. Academic dishonesty includes unfairly advancing one's own academic performance or the performance of another, as well as intentionally limiting or impeding the academic performance of a fellow student. Penalties will depend on the situation, ranging from a zero on the paper to failing the course. (See MUW Student Handbook)

Tentative Schedule (not counting holidays and exam days)

Chapter 1	sections 1-4	1 week
Chapter 2	sections 1-5	1 week
Chapter 3	sections 1-4	1 week
Chapter 5	sections 1-3	1 week
Chapter 6	sections 1-4	2 weeks
Chapter 7	sections 1-3	1 week
Chapter 8	sections 1-4	1 week
Chapter 9	sections 1-5	2 weeks
Chapter 12	sections 1-4	2 weeks
Chapter 4	sections 1-4	1 week

The instructor reserves the right to make changes on the syllabus if it is absolutely necessary to accommodate unexpected circumstances. In such a case, the students will be notified of any changes in class and/or through Blackboard.

A last piece of advice: Some students feel that completing their homework is enough studying for an exam. This is <u>not</u> true. You must know the material well enough to solve problems and answer questions <u>without</u> notes or books or friends. Historically, some students have done very well on homework (over 90%), yet earned failing scores on exams. This is not because exam questions are any harder than homework questions. Rather students have not prepared themselves for the exam environment. Taking a test with only you and the questions is not the same as doing homework with the use of notes and book and classmates. Be sure to study and prepare for the exam setting throughout the semester.

MA 130 PRECALCULUS SECTION 001 MWF 10:00-10:50 PH 104

Instructor: Agnes M. Carino Phone: 662-329-7236 Office: Parkinson Hall 120 E-mail: amcarino@muw.edu

Office Hours: MW 11 AM -12:30 PM, T 12:30 -2:00PM, TR 1:00-2:30PM or by appointment

Software Requirement : *MyMathLab associated with the textbook, Precalculus by Lial, Hornsby, Schneider,* 5th Edition, CourseID: carino37493. Textbook is optional.

Other Required Material: You must have a graphing calculator in class. I will be using a TI-83 for classroom demonstrations. You may not share calculators in class. You may not use a calculator with symbolic capabilities (TI-89/NSpire or similar) nor cellphones or similar devices.

Prerequisites: MA 113 or or three years of high school mathematics, including two years of algebra. A knowledge of trigonometry will be VERY helpful.

Nature of Course Content/Course Description: This course will cover functions and their graphs, including polynomial and rational functions, trigonometric functions, exponential and logarithmic functions, and conics. **Emphasis will be placed on knowledge, skills, and techniques needed in higher-level mathematics courses such as Calculus I.**

Topics in the Order They Will be Covered (subject to change):

Preliminaries, Sections 2.6 -- 2.8 Graphs of Basic Functions, Graphing Techniques, Function Operations and Composition

Sections 3.4 – 3.6 Polynomial and Rational Functions: Graphs, Applications, and Models, Variations

Sections 4.1 – 4.6 Exponential Functions, Logarithmic Functions, Exponential and Logarithmic Equations, Exponential and Logarithmic Models

Sections 5.1 – 5.4 Angles, Trigonometric Functions, Evaluating Trigonometric Functions, Solving Right Triangles

Sections 6.1 – 6.5 The Circular Functions and Their Graphs, The Unit Circle and Circular Functions, Graphs and Translations

Sections 7.1 – 7.7 Trigonometric Identities and Equations, Fundamental, Sum-Difference, Double-Angle and Half-Angle Identities

Additional topics as time permits: Applications of Trigonometry, Matrices, Conic Sections, Limits

Tentative Quiz Dates: Jan 24, Feb 7(Online), Feb 21, Feb 28(Online), Mar 14, Apr 5 (Online), Apr 11, May 2(Online). Test #1: Friday February 14 Test #2: Friday March 28 Test #3: Wednesday April 30

FINAL COMPREHENSIVE EXAM: MAY 8 WEDNESDAY, 11:30AM - 2:30PM

Desired Student Goals and Outcomes: In Precalculus, the goal is to create a firm foundation of mathematical knowledge on which the students may build in future courses. After completing the course, students should be able to:

- 1. solve polynomial, rational, trigonometric, exponential, and logarithmic equations;
- evaluate and graph polynomial, rational, trigonometric, exponential, and logarithmic functions;
- work with functions: finding inverses, operations and compositions of functions, finding domain and range;
- 4. solve word problems;
- 5. relate circular and triangle approach to trigonometry and prove trigonometric identities;
- 6. have some intuitive understanding of limits.

Homework and Quizzes: All homework will be submitted online through your MyMathLab account which you will create when you self-enroll in

<u>http://www.pearsonmylabandmastering.com/northamerica/mymathlab/</u> For your username: Enter your first and middle initial and last name followed by the last 3 digits of your NetID, for example, amcarino766. If you have an existing account enter as usual using your username and password. Refer to the last page of the syllabus for detailed instructions. The due dates may change depending on what has been covered in class. The lowest 5 homework will be dropped. There will be 4 online guizzes which will be timed.

Grading Scale: A : 90-100 B : 80-89 C : 70-79 D : 60-69 F : Below 60 (Any adjustments will be made at the discretion of the instructor.)

Grading System:

Homework	15%
Quizzes (4 in-class and 4 online)	15%
3 Tests (15% each)	45%
Comprehensive Final Exam	25%

Academic Dishonesty: All of your graded work should be your own effort and no one else's. The Academic Dishonesty section under Academic Information in the MUW Student Handbook clearly defines cheating and plagiarism. You will be held to the Academic Standards described under Student Rights and Responsibilities.

Attendance Policy: The Department of Sciences and Mathematics requires that you attend at least 70% of the classes in order to be eligible to earn a passing grade in a course. This means that you must have no more than **12** absences, excused and unexcused. Leaving before the class period ends without permission will be considered an absence. It is your responsibility to sign-in your name every class meeting.

118

Electronic Devices: All cell phones, iPods, tablets, and any other electronic devices must be turned off and stowed away out of sight. Any students violating this rule will be counted absent for that day without warning to avoid disrupting the class. If your cell phone rings, or creates any alert sound, or vibrates during class, you will be asked to leave class and will be counted absent. If this happens the second time, you will have to leave class and must talk to your instructor before you can return. These devices cannot be used as calculators or for note-taking. You will learn better if you write your notes and transfer them later to your device. During an exam if your device rings, you will be warned the first time and the second time, you will be asked to leave and will be forced to submit your test even if you are not yet finished with it.

Students with Disabilities: It is the responsibility of students who have professionally diagnosed disabilities to notify the instructor so that necessary and appropriate modifications can be made to meet any special learning needs.

Early Alert Program: As one part of the academic early-alert program, the early-alert coordinator will be notified at your 6th missing homework assignment, your third class absence, or your first failed quiz or test, up to the midterm. As another part of the academic early-alert program, students who perform poorly at midterm (falling below a midterm semester GPA of 2.0) will have holds placed on their accounts. The early-alert holds for poor midterm performance serve not as a punitive measure, but rather as an opportunity for students to seek the advice of their faculty advisors at a crucial moment in the semester. Students who have early-alert holds on their accounts for poor midterm performance should schedule meetings with their faculty advisors, who will work with the students to draw up action plans for academic success. Once those plans are in place, the early-alert holds for poor midterm performance will be released.

Important Dates:

January 17	Last day to enter classes for credit and change from grade to pass-fail
February 10	Last day to drop without WP or WF or change from credit to audit
April 15	Last day a course may be dropped
April 15	Last day to withdraw from the university

The instructor of the course reserves the right to make changes on the syllabus if it is absolutely necessary to accommodate unexpected circumstances. In this case, you will be notified of any changes that should take place.

MyStatLab

Welcome Students!

MyStatLab is an interactive website where you can:

- · Self-test & work through practice exercises with step-by-step help to improve your math skills.
- Study more efficiently with a personalized study plan and exercises that match your book.
- Get help when YOU need it. MyStatLab includes multimedia learning aids, videos, animations, and live tutorial help.

Before You Begin:

To register for MyStatLab, you need:

- A MyStatLab student access code (packaged with your new text, standalone at your bookstore, or available for purchase with a major credit card at <u>www.pearsonmylab.com</u>)
- ☑ Your instructors' Course ID: carino37493
- A valid email address

Student Registration:

- Enter www.pearsonmylab.com in your web browser.
- Under Register, click Student.
- Enter your Course ID exactly as provided by your instructor and click Continue. Your course information
 appears on the next page. If it does not look correct, contact your instructor to verify the Course ID.
- Sign in or follow the instructions to create an account. Use an email address that you check and, if possible, use that same email address for your username. Read and accept the License Agreement and Privacy Policy.
- Click Access Code. Enter your Access Code in the boxes and click Next. If you do not have an access code and want to pay by credit card or PayPal, select the access level you want and follow the instructions. You car. also get temporary access without payment for 17 days..

Once your registration is complete, a **Confirmation** page appears. You will also receive this information by email. Make sure you print the Confirmation page as your receipt. Remember to write down your username and password. You are now ready to access your resources!

Signing In:

- Go to <u>www.pearsonmylab.com</u> and click Sign in.
- Enter your username and password and click Sign In.
- On the left, click the name of your course.

The first time you enter your course from your own computer and anytime you use a new computer, click the **Installation Wizard** or **Browser Check** on the Announcements page. After completing the installation process and closing the wizard, you will be on your course home page and ready to explore your MyStatLab resources!

Need help? Contact Product Support at http://www.mystatlab.com/student-support for live CHAT, email, or phone support.

MA 181-001 CALCULUS I SPRING 2014

Instructor: Agnes M. Carino Phone: 662-329-7379

MWF 8:00-8:50

Office: Parkinson Hall 120 E-mail: amcarino@muw.edu

PH 104

Office Hours: MW 11AM -12:30PM, T 12:30 - 2:00PM, TR 1:00 - 2:30PM, or by appointment

Text: Thomas' Calculus. Weir, Hass, and Giordano. Twelfth edition, Addison Wesley.

Prerequisites: MA 113 and MA 114, or MA 130, or high school equivalent

<u>Course Content</u>: A thorough treatment of differential calculus including the concepts of limits, continuity, derivatives, and applications of derivatives. This will be the following chapters, covered in the order listed:

Chapter 2 Limits and Continuity; sections 1-6

Rates of Change and Tangents to Curves; Limit of a Function and Limit Laws; The Precise Definition of a Limit; One-Sided Limits; Continuity; Limits Involving Infinity; Asymptotes of Graphs

Chapter 3 Differentiation; sections 1-9

Tangents and the Derivative at a Point; The Derivative as a Function; Differentiation Rules; The Derivative as a Rate of Change; Derivative of Trigonometric Functions; The Chain Rule; Implicit Differentiation; Related Rates; Linearization and Differentials

Chapter 4 Applications of Derivatives; sections 1-7

Extreme Values of Functions; The Mean Value Theorem; Monotonic Functions and the First Derivative Test; Concavity and Curve Sketching; Applied Optimization Problems; Newton's Method; Antiderivatives

<u>Course Objectives:</u> This course covers differential calculus and meets the University Core learning objective stated as: "Demonstrate fundamental skills and understand mathematical concepts sufficient to do complex computations in Algebra, Trigonometry, Calculus, or Discrete Mathematics." In particular, after successful completion of this course the student should be able to:

- explain and use the concept of limit;
- explain and use the concept of continuity;
- find rates of change and tangent lines;
- understand the various interpretations of the derivative;
- find derivatives of functions defined explicitly or implicitly;
- use the definition to derive basic algebraic and trigonometric derivative formulas;
- apply the product, quotient, and chain rules;
- calculate higher order derivatives;
- understand derivative information as it relates to curve sketching;
- understand and solve related rates problems; and
- understand and solve first-order differential equations.

Course Requirements: The student is expected to:

- attend and participate in all class meetings;
- read the text;
- complete all assignments and quizzes;
- take and pass all scheduled exams and the comprehensive final exam.
- watch the video lectures and take notes.

Tentative Dates of Tests:

Test 1: Wednesday, February 12, 2014 Test 2: Wednesday, March 5, 2014 Test 3: Wednesday, April 9, 2014 Test 4: Wednesday, April 30, 2014

FINAL COMPREHENSIVE EXAM: MAY 8, THURSDAY, 8:00 -- 11:00AM

Grading Scale: A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: Below 60

(Any adjustments will be made at the discretion of the instructor.)

Grading System:

Homework, Quizzes, Maple	25%
4 Tests (12.5% each)	50%
Comprehensive Final Exam	25%

Academic Dishonesty: All of your graded work should be your own effort and no one else's. The Academic Dishonesty section under Academic Information in the MUW Student Handbook clearly defines cheating and plagiarism. You will be held to the Academic Standards described under Student Rights and Responsibilities.

Attendance Policy: The Department of Sciences and Mathematics requires that you attend at least 70% of the classes in order to be eligible to earn a passing grade in a course. This means that you must have no more than **12(8)** absences, excused and unexcused. Leaving before the class period ends without permission will be considered an absence. It is your responsibility to sign-in your name every class meeting.

Electronic Devices: All cell phones, iPods, MP3 players, and any other electronic devices must be turned off and stowed away out of sight. Any students violating this rule will be counted absent for that day without warning to avoid disrupting the class. If your cell phone rings, or creates any alert sound, or vibrates during class, you will be asked to leave class and will be counted absent. If this happens the second time, you will have to leave class and must talk to your instructor before you can return. These devices cannot be used as calculators or for note-taking. You will learn better if you write your notes and transfer them later to your device. During an exam if your device rings, you will be warned the first time and the second time, you will be asked to leave and will be forced to submit your test even if you are not yet finished with it.

Students with Disabilities: It is the responsibility of students who have professionally diagnosed disabilities to notify the instructor so that necessary and appropriate modifications can be made to meet any special learning needs.

Early Alert Program: As one part of the academic early-alert program, the early-alert coordinator will be notified at your 6th missing homework assignment, your third class absence, or your first failed quiz or test, up to the midterm. As another part of the academic early-alert program, students who perform poorly at midterm (falling below a midterm semester GPA of 2.0) will have holds

placed on their accounts. The early-alert holds for poor midterm performance serve not as a punitive measure, but rather as an opportunity for students to seek the advice of their faculty advisors at a crucial moment in the semester. Students who have early-alert holds on their accounts for poor midterm performance should schedule meetings with their faculty advisors, who will work with the students to draw up action plans for academic success. Once those plans are in place, the early-alert holds for poor midterm performance will be released.

Important Dates:

January 17	Last day to add and/or drop via Banner Web
February 10	Last day to drop without WP or WF or change from credit to audit
April 15	Last day a course may be dropped
April 15	Last day to withdraw from the university

The instructor of the course reserves the right to make changes on the syllabus if it is absolutely necessary to accommodate unexpected circumstances. In this case, you will be notified of any changes that should take place.

MA 182-001 CALCULUS II SPRING 2014 TTR 11-12:15PM PH 104

Instructor: Agnes M. Carino Phone: 662-329-7379 Office: Parkinson Hall 120 E-mail: amcarino@muw.edu

Office Hours: MW 11 AM -12:30 PM, T 12:30-2:00PM, TR 1:00-2:30PM, or by appointment

Text: Thomas' Calculus, Weir, Hass, and Giordano, 12th edition, Addison Wesley

Prerequisite: MA 181

Course Content: A thorough treatment of integral calculus.

Preliminaries and Review

Chapter 5 Integration; Sections 1-6 (~3 weeks)

Area and Estimating with Finite Sums; Sigma Notation and limits of Finite Sums; The Definite Integral, The Fundamental Theorem of Calculus; Indefinite Integrals and the Substitution Method; Substitution and Area Between Curves

Chapter 6 Application of Definite Integrals; Sections 1-6 (~3 weeks)

Volumes Using Cross-Sections; Volumes by Cylindrical Shells; Arc Length; Areas of Surfaces of Revolution; Work and Fluid Forces; Moments and Centers of Mass Chapter 7 Transcendental Functions; Sections, 1-8 (~4 weeks)

Inverse Functions and Their Derivatives; Natural Logarithms; The Exponential Functions; Exponential Change and Separable Differential Equations; Indeterminate Forms and L'Hopital's Rule; Inverse Trigonometric Functions; Hyperbolic Functions; Relative Rates of Growth

Chapter 8 Techniques of Integration; Sections 1-7 (~3 weeks)

Integration by Parts; Trigonometric Integrals; Trigonometric Substitution; Integration of Rational Functions by Partial Fractions; Integral Tables and Computer Algebra Systems; Numerical Integration; Improper Integrals

Course Objectives: This course covers differential calculus and meets the University Core learning objective stated as: "Demonstrate fundamental skills and understand mathematical concepts sufficient to do complex computations in Algebra, Trigonometry, Calculus, or Discrete Mathematics." In particular, after successful completion of this course the student should be able to:

- Understand the concepts of antiderivatives and integration;
- Understand the relationship between Riemann sums and definite integrals;
- Use the antiderivative to solve applied problems;
- Use numerical methods to approximate definite integrals;
- · Understand and use the Fundamental Theorem of Calculus;
- Understand and solve integration applications: areas, volumes of revolutions, arc lengths;
- Use logarithmic, exponential, inverse trigonometric, and hyperbolic functions in a calculus setting;
- Understand indeterminate forms and use L'Hopital's Rule;
- · Understand and use various techniques of integration, especially u-substitution; and
- Understand and evaluate improper integrals.

Course Requirements: The student is expected to:

- attend and participate in all class meetings;
- read the text;
- · complete all assignments and quizzes;
- take and pass all scheduled exams and the comprehensive final exam.

Tentative Dates of Tests:

Test 1: Thursday, February 13, 2014 Test 2: Thursday, March 6, 2014 Test 3: Thursday, April 10, 2014 Test 4: Thursday, May 1, 2014

FINAL COMPREHENSIVE EXAM: MAY 8, THURSDAY, 11:30AM - 2:30PM

Grading Scale: A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: Below 60

(Any adjustments will be made at the discretion of the instructor.)

Grading System:	Homework, Quizzes, Maple	25%
Grading System.	4 Tests (12.5% each)	50%
	Comprehensive Final Exam	25%

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the second time, you will be asked to leave and will be forced to submit your test even if you are not yet finished with it.

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FALL SEMESTER 2013

MA 305: Linear Algebra SEC 001 MWF11:00 – 11:50 PH103

INSTRUCTOR: Joshua Hanes 329-7237 jhanes@as.muw.edu PH201C

OFFICE HOURS: 10-11 MWF, 8:30-9:30,12:30-1pm TR and by appointment

Feel free to call or email me if you need to arrange an appointment outside of my normal office hours. I should always be the first person you come to with your questions about course content.

TEXT: Linear Algebra and its Applications (Updated 4th edition). Lay (2011). You may use a calculator but you must have working knowledge of it. You may not share calculators during quizzes or tests. You may not use phones/pagers as calculators.

PREREQUISITE: MA 182 (Calculus II)

NATURE OF THE COURSE CONTENT

This lecture-based course covers systems of linear equations, matrices, vector spaces, vectors determinants, eigenvalues and eigenvectors, orthogonality, symmetric matrices, and applications.

TOPICS AND ORDER COVERED

Weeks 1-4	Chapter 1:	Linear Equations in Linear Algebra
	Systems of line	ear equations; row reduction and echelon forms; vector equations; the
	matrix equation	n; solution sets of linear systems; linear independence
Weeks 4-7	Chapter 2:	Matrix Algebra
	Matrix operation	ons; the inverse of a matrix; characterizations of invertible matrices;
	partitioned mat	rices; subspaces; dimension and rank
Weeks 7-8	Chapter 3:	Determinants
	Determinants p	roperties
Weeks 8-10	Chapter 4:	Vector Spaces
	Vector spaces a	and subspaces; null spaces, column spaces, and linear transformations;
	linearly indepe	ndent; sets and bases; the dimension of a vector space
Weeks 11-12	Chapter 5:	Eigenvalues and Eigenvectors
	Eigenvectors an	nd eigenvalues; the characteristic equation; diagonalization; eigenvectors
	and linear trans	formations; discrete dynamical systems
Weeks 13-15	Chapter 6:	Orthogonality and Least Squares
	Inner Product,	length and orthogonality; orthogonal sets; the Gram-Schmidt process;
	least-squares pi	oblems; inner product spaces

DESIRED GOALS AND OUTCOMES

1. solve a system of equations.	2. exhibit a vector as a linear combination of vectors.
3.determine linear independence or dependence.	4. find the standard matrix for a linear transformation.
5. describe the action of operators.	6. compute the inverse and use a matrix inverse to solve a system of equations.
7. use matrix algebra to solve matrix equations.	8. use the Invertible Matrix Theorem to connect various properties of square matrices.
9. determine if a set of vectors spans.	10. find the bases.
11. find the dimension of a subspace.	12. know the Rank Theorem.
13. compute the determinant.	14. know the properties of determinants with respect to inverses, products, transposes and scalar multiples.
15. use the characteristic polynomial to find eigenvalues of a matrix.	16. determine if a matrix is diagonalizable and be able to diagonalize a matrix.
17. know the significance of a dominant eigenvalue for long-term behavior of a dynamical system.	18. compute the length of a vector.
19. normalize a vector.	20. check a set for orthogonality.
21. know the identities needed to compute the orthogonal complement of a subspace.	22. use the Gram-Schmidt process to obtain an orthogonal basis for a subspace.
23. compute the QR factorization of a matrix and use it to solve linear systems.	24, compute the orthogonal projection of a vector onto a subspace.
25. find a leas squares solution of a system and compute the least squares error.	26. find the least squares line that best fits the given data.
27. find the coordinate vector of a polynomial relative to a given basis.	28. compute the inner product space with respect to the usual integral inner product.
29. compute the best approximation of a function by polynomials and know how this relates to orthogonal projections.	30. diagonalize a given matrix if possible.

After successful completion of the course the student should be able to:

REQUIREMENTS OF THE COURSE:

The student is expected to:

- 1. attend and participate in at least 70% of all class meetings (you can miss up to 13 days);
- 2. read the text and other related reading assignments;
- 3. complete daily homework assignments;
- 4. turn in all assignments when due or receive no credit;
- 5. take and pass the following scheduled tests and a comprehensive final examination.

ASSESSMENT PLAN:

4 Exams	11.25% per exam	45%
Homework/Quizzes		20%
Maple labs		10%
Final Exam	Thursday, December 12; 11:30-2:30	25%

There are NO makeup exams. If under ANY circumstances (excused or unexcused) you cannot come to a test, you will have the option to have the final percentage score count twice. However, this holds for only ONE exam.

Late homework or labwork will NOT be accepted late.

<u>The date and time for the final is SET!</u> You may NOT take the final early or at another time. You must be on time for all tests. Short quizzes may be given throughout the semester. The quizzes will start at the beginning of class and will last 15 minutes. Therefore, tardiness is not acceptable. Be prepared for class by keeping up on your homework assignments and keeping up with Maple assignments.

There will be at least three *Maple* assignments. A working knowledge of *Maple* is expected at this time in your academic career. If you do not know *Maple*, please see me during my office hours. Do not wait until the day before to start the assignment. When turning in a *Maple* assignment, you must write at least a half page report on what the lab was about and what you did. You should write this assignment as if someone is reading it without any knowledge of *Maple* and limited knowledge of Linear Algebra. I want to read what you have learned not just what *Maple* can do.

Grades will be assigned no stricter than the following scale:

A=90-100 B=80-89 C=70-79 D=60-69 F=below 60

Keep all of your returned and graded papers in a folder. These will serve to verify the accuracy of midterm and final grades, as well as help you study for the final. If there are any questions about your final grade, please contact me first so that I may look through my records for accuracy.

CALCULATORS AND ELECTRONIC DEVICES

A scientific calculator is required for this course. We do <u>not</u> allow any symbolic calculators, such as TI-89 and TI-92 (or the equivalent in another brand name; e.g. Sharp, Casio, etc.). If you have questions concerning this requirement, please see the instructor.

All cell phones, iPods, MP3 players, and any other electronic devices must be turned off and stowed away out of sight. Any students violating this rule will be asked to leave the class for the remainder of the class period, and the students will be counted absent for that day.

STUDY HABITS:

Suggested (minimum) out-of-class study time for this class is 10 hours a week. You should read, ponder, and work through examples in the assigned section of the textbook. Then you should work on the assigned practice problems. On the problems you do not understand, you should clarify by means of study groups, tutors, or the instructor.

DISABILITY STATEMENT:

The university does not discriminate on the basis of disability. Reasonable accommodations will be made for any student with a documented disability. Students in need of special accommodations due to a disability are encouraged to speak with me as soon as possible, so that I can ensure all student needs are met. The student should also contact the Center for Academic Excellence Disability Services Coordinator.

ATTENDANCE:

The Division of Science and Mathematics requires that you attend at least 70% of the classes in order to be eligible to earn a passing grade in a course. That means you may miss up to 13 class meetings. If you do miss, it is your responsibility to get the notes from your peers, review the notes, read the book, and try the homework. If you have questions after you have done all of this, then you can come by my office.

ACADEMIC DISHONESTY:

The Academic Dishonesty section under Academic Information in the MUW Student Handbook clearly defines cheating and plagiarism. You will be held to the Academic Standards described under Student Rights and Responsibilities. This includes copying someone's work in *Maple*. A zero will be given on the assignment which will not be dropped and the appropriate administration will be notified.

EARLY ALERT PROGRAM

As one part of the academic early-alert program, students who perform poorly at midterm (falling below a midterm semester GPA of 2.0) will have holds placed on their accounts. The early-alert holds for poor midterm performance serve not as a punitive measure, but rather as an opportunity for students to seek the advice of their faculty advisors at a crucial moment in the semester. Students who have early-alert holds on their accounts for poor midterm performance should schedule meetings with their faculty advisors, who will work with the students to draw up action plans for academic success. Once those plans are in place, the early-alert holds for poor midterm performance will be released.

IMPORTANT DATES

- August 26 Last day to add and/or drop via Banner Web
- October 1 Last day to drop without WP or WF or change from credit to audit
- November 15 Last day a course may be dropped

November 15 Last day to withdraw from the university

Monday	Tuesday	Wednesday	Thursday	Friday	
Aug 19	Aug 20	Aug 21 Class 1.1	Aug 22	Aug 23 Class 1.2, 1.3	
Aug 26 Class 1.4	Aug 27	Aug 28 Class 1.5, 1.6		Aug 30 Class 1.7	
Sep 2 Labor Day	Sep 3	Sep 4 Class 1.8	Sep 5	Sep 6 Class 1.9	
Sep 9 Class 1.10	Sep 10	Sep 11 Class 2.1	Sep 12	Sep 13 Class 2.2	
Sep 16 Class 2.3	Sep 17	Sep 18* Test #1	Sep 19	Sep 20 Class 2.3	
Sep 23 Class 2.4	Sep 24	Sep 25 Class 2.5	Sep 26	Sep 27 Class 3.1	
Sep 30 Class 3.2	Oct 1	Oct 2 Class 3.3	Oct 3	Oct 4 Class 3.3	
Oct 7 Class 4.1	Oct 8	Oct 9* Test #2	Oct 10	Oct 11 Class 4.2	
Oct 14 Fall Break	Oct 15 Fall Break	Oct 16 Class 4.3	Oct 17	Oct 18 Class 4.4	
Oct 21 Class 4.5	Oct 22	Oct 23 Class 4.6	Oct 24	Oct 25 Class 4.6	
Oct 28 Class 4.7	Oct 29	Oct 30 Class 5.1	Oct 31	Nov 1 Class 5.2	
Nov 4 Class 5,2	Nov 5	Nov 6* Test #3	Nov 7	Nov 8 Class 5.3	
Nov 11 Class 5.4	Nov 12	Nov 13 Class 6.1	Nov 14	Nov 15 Class 6,2	
Nov 18 Class 6.2	Nov 19	Nov 20 Class 6.3	Nov 21	Nov 22 Class 6.4	
Nov 25* Test #4 Class 6.4	Nov 26	Nov 27 Thanksgiving Holidays	Nov 28 Thanksgiving Holidays	Nov 29 Thanksgiving Holidays	
Dec 2 Class 6.5	Dec 3	Dec 4 Review	Dec 5	Dec 6 Review	
Dec 9* Final Exams	Dec 10* Final Exams	Dec 11* Final Exams	Dec 12* Final Exams	Dec 13* Final Exams	

Very Tentative schedule for MA 305 Linear Algebra Fall 2013

The instructor reserves the right to make changes on this syllabus should the need arise. You will be given ample notice should any changes take place. Please feel free to ask questions during class and to consult me any time you wish to do so. The best means of contacting me is by email, so please utilize this. It is vital that you do not fall behind.

MA 318 – MATHEMATICS FOR SECONDARY SCHOOL TEACHERS

Dr. Bonnie Oppenheimer F Office: 106B Parkinson Hall Phone: 329-7239 e-mail: boppenheimer@as.muw.edu

FALL 2013

3 semester hours MW 2:00-3:15 p.m. Parkinson Hall 216

Office Hours

My office hours will be held in Parkinson 216 (our classroom) Monday, Wednesday, and Friday 10:00-11:00 a.m.; Tuesday and Thursday from 9:30-10:30 a.m.; and Monday and Wednesday from 1:30-2:00 p.m. If my announced office hours are not convenient for you, feel free to call or e-mail me to arrange an appointment at our mutual convenience, or stop by my office to see if I am in. (I keep my office door closed; you can't tell I am in my office unless you knock loudly.) We can usually find a time to meet that will suit both of our busy schedules. If I am already working with another student, let me know that you wish to speak with me. If your needs mesh, I might want to work with both of you at the same time. At The W, we want to nurture all teacher candidates' individual differences while providing them with development of appropriate depth and breadth in their understanding and experiences. I should always be the first person you come to with your questions.

Textbook and Other Requirements

<u>The Mathematics that Every Secondary School Teacher Needs to Know</u> by Sultan and Artzt, Routledge. A graphing calculator is required. You may use whichever type you already own; I will be using a TI-84 in class. You will eventually need an excellent compass. If you already own one, bring it in and let me see it.

Nature of Course Content/Course Description

MA 318 has a prerequisite of MA 113 College Algebra and one additional mathematics course numbered above MA 113. To prepare education majors to teach mathematics at the middle school or secondary level, this problem-based course will examine topics from the secondary school mathematics framework from an advanced perspective. *This course cannot be used as an upper-level elective for the mathematics major or mathematics minor.*

Desired Student Goals and Outcomes

In Mathematics for Secondary School Teachers, the goal is to create a unified view of the mathematics presented at the middle school and secondary level. Students will analyze alternate definitions, language, and approaches to mathematical ideas; extend and generalize familiar theorems; discuss the historical context in which concepts arose and have changed over time; apply mathematics in a wide range of settings; analyze common problems of high school mathematics with greater depth; demonstrate alternate ways of approaching problems, including ways with and without a calculator and computer technology; connect ideas that may have been studied separately in different courses; and relate ideas studied in school to ideas students may encounter in later study.

Requirements of the Course/Method of Evaluation/Makeup Policy

Rubrics will be used to evaluate group presentations (20%). Every student will do an historical project (10%). Individual homework will be collected for grading (20%). A midterm exam will be given (25%) and a comprehensive final exam (25%) will determine your semester grade. A tentative schedule is included. Attendance policies are stated in their own section. There will be no makeup tests. If you need to leave a test for any reason, the test will be turned in and scored as is. A grade of zero will be assigned for the missed test(s). <u>Homework will never be accepted late, even if you were absent the day it was due.</u> I will drop your lowest homework grade. A graphing calculator is required. I will use a TI-84 in class. You will eventually need a good compass.

Mississippi Council of Teachers of Mathematics Fall Conference

The MCTM Conference will be held September 20-21, in Biloxi. Please consider attending this conference. I will probably be speaking on elementary topics both Friday and Saturday. The registration fee is \$10; lunch will be provided. Attendance at this conference is recommended in this class. Unless you want to ride with me on Friday, we cannot provide transportation. Details will follow

Homework

Homework will be assigned weekly. Homework will be collected the next week, and will be graded on a ten-point scale, based on accuracy of answers. Homework is DUE at the beginning of class and WILL NOT be accepted after the class time for any reason. <u>Homework will never be accepted late, even if you were absent the day it was due.</u> I will be happy to review a missed assignment for you, so you are sure you understand the material you missed. I will drop your lowest homework grade to account for an emergency. You are welcome to work in groups on your homework; however, what you turn in must reflect your own understanding. Presentation is important – all work needs to be shown for the assignment to be judged complete.

Historical Project

Graded with a rubric, each student will choose a famous mathematician, write an essay about that mathematician, and provide a 10-minute PowerPoint presentation. Every student must have a different mathematician, so if you have a favorite, choose early!

Attendance

Students must attend at least 70% of the classes in Department of Sciences and Mathematics course. This means you may have a maximum of 8 absences. If you are absent when your group presents, you will not receive the group grade for the presentation. In order to receive credit for this course, a student must have at least a 60 average and must have attended at least 70% of the classes.

Early Alert

I will notify the Early Alert Coordinator, after your first absence, after your second missing assignment, or if you fail the midterm. As one part of the academic Early Alert Program, students who perform poorly at midterm (falling below a midterm semester GPA of 2.0) will have holds placed on their accounts. The early alert holds for poor

midterm performance serve, not as a punitive measure, but rather as an opportunity for students to seek the advice of their faculty advisors at a crucial moment in the semester. Students who have early alert holds on their accounts for poor midterm performance should schedule meetings with their faculty advisors, who will work with the students to draw up action plans for academic success. Once those plans are in place, the early alert holds for poor midterm performance will be released.

Disabilities Statement

It is the responsibility of students who have professionally diagnosed disabilities to notify the instructor so that necessary and appropriate modifications can be made to meet any special learning needs.

Gra	ding Scale	(no st	ricter than)						
A	90-100	В	80-89	С	70-79	D	60-69	F	Below 60

Academic Dishonesty

Please check the Student Handbook sections on "Academic Information" and "Student Rights and Responsibilities." MUW is known for high academic standards, ideals, and traditions. Each student in MA 318 is expected to uphold this code: "I pledge myself to uphold the highest standards of honesty in all phases of university life both alone and with many and accept my responsibility for helping others to live up to such standards. All this I will do that my University may become greater, better and more beautiful than when I entered it." Cheating earns a zero for the first offense; I will report you to the Academic Standards Board if there is a second occurrence.

Cultural Diversity

Mathematics is the great equalizer. It is the belief of the National Council of Teachers of Mathematics that all students can learn mathematics.

Technology

Manipulatives of all kinds (e.g., compasses) may be used in this course; graphing calculators are required. We will also use a classroom set of Math Explorer calculators. The computer lab will be available in 105/107 Parkinson Hall. Look under Apps for a program called GSP, which is *Geometer's Sketchpad*.

Study Hints

- Read the section we will discuss in class before the lecture. Read any mathematical text slowly, with pencil in hand, working examples as they occur.
- Since later ideas are based on the understanding of earlier material, all questions should be resolved as soon as you can. We offer free tutoring for lower-level classes, but we will not have a tutor assigned for MA 318. Come to office hours as soon as you realize you need help. Feel free to make an appointment at our mutual convenience if you are busy during my posted office hours.
- Do the homework. Be sure you understand any corrections made to your homework before the test over that material.
- Be sure you understand any corrections made to your midterm before the final.

Topics and Order Covered; Tentative Test Dates; Topics

The following sections will be covered as time permits. The midterm test date is firm (Wednesday, October 9th); the exact content of this test will be adjusted as necessary. Intuition and Proof Basics of Number Theory Theory of Equations Measurement: Area and Volume The Triangle: Its Study and Consequences Building the Real Number System Building the Complex Numbers Induction, Recursion, and Fractal Dimension Functions and Modeling Geometric Transformations Trigonometry Data Analysis and Probability Introduction to Non-Euclidean Geometry Three Problems of Antiquity Comprehensive final exam: Tuesday 12/10/13 3:00-6:00 p.m.

Teacher as Reflective Decision Maker

Every attempt will be made to approach this course in such a way that the students see the types of decisions required to choose between different teaching techniques. Students should become familiar with the common manipulatives used in mathematical concept development, and be able to justify using one over another for a particular topic. Hence this course is congruent with University goals and the theme of the teacher education unit: "The Teacher as a Reflective Decision Maker."

InTASC Model Core Teaching Standards: April 2011

Standard #1: Learner Development: The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

The presentations should include activities that could interest students with a variety of learning styles and/or multiple intelligences.

Standard #2: Learning Differences: *The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.*

Standard #3: Learning Environments: The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.

Students will present their solutions in a group environment, and will have to monitor group interactions during their presentations.

Standard #4: Content Knowledge: The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

The midterm and the final will test central concepts and structures in the middle school and secondary mathematics curriculum. There will be two opportunities for groups to create presentations that will make the solution to a problem meaningful for students by using manipulatives, graphing calculators, PowerPoint, and/or *Geometer's Sketchpad*.

Standard #5: Application of Content: The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Instructional strategies will be explored both in classroom demonstrations and in the group presentations, which should include questioning to encourage critical thinking, and should showcase a problem-solving technique.

Standard #6: Assessment: The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Students will be assessed on a rubric for individual presentations, and on a rubric for group presentations.

Standard #7: Planning for Instruction: The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Groups plan their presentations so that the rest of the class will be able to understand the subject matter being addressed.

Standard #8: Instructional Strategies: The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Effective verbal communication will be stressed in the presentations; presentations have to be technology-enhanced.

Standard #9: Professional Learning and Ethical Practice: The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Standard #10: Leadership and Collaboration: *The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.*

Students will work collaboratively with fellow students to plan their presentations.

COURSE REFERENCES

A Brief bibliography for knowledge that supports this conceptual framework Burbaker, D. & Simon, L. (1993). Teacher as decision maker. Newbury Park, CA: Corwin Press, Inc.

National Council of Teachers of Mathematics. (2000). Principles and standards for school mathematics. Reston, CA: NCTM

Various NCTM Yearbooks and journals such as *Mathematics Teaching in the Middle School* and the *Mathematics Teacher*, as well as *Journal for Research in Mathematics Education*

The AMTE Journal: Journal of Mathematics Teacher Education Common Core Standards Mathematics

MA 319 - MATERIALS AND METHODS IN THE TEACHING OF SECONDARY MATHEMATICS

Dr. Bonnie OppenheimerFallOffice:106B Parkinson Hall2012Phone:329-7239E-mail:boppenheimer@as.muw.cdu

3 semester hours Section 001: MW 2:00-3:15 p.m. Parkinson Hall 216

Office Hours

My office hours will be held in Parkinson 216 (our classroom) Monday 1-2 p.m.; Monday 3:30-5:30 p.m.; Wednesday 12:30-2:00 p.m.; and Friday from 1:00-2:30 p.m. (Tuesdays and Thursdays are open to visit my teacher intern.) If my announced office hours are not convenient for you, feel free to call or e-mail me to arrange an appointment at our mutual convenience, or stop by my office to see if I am in. (I keep my office door closed; you can't tell I am in my office unless you knock loudly.) We can usually find a time to meet that will suit both of our busy schedules. If I am already working with another student, let me know that you wish to speak with me. If your needs mesh, I might want to work with both of you at the same time. At MUW, we want to nurture all teacher candidates' individual differences while providing them with development of appropriate depth and breadth in their understanding and experiences. I should always be the first person you come to with your questions.

Course Description

Prerequisite: Admission to the Teacher Education Program

MA 319 is required of all mathematics majors who will be licensed in secondary mathematics. Topics include a brief history of mathematics, including contributions of underrepresented groups and diverse cultures in the development of mathematics, objectives of the teaching of mathematics, consideration of topics that are or should be included in mathematics courses for junior and senior high school, a survey of instruction and technology in mathematics, and the use of these teaching techniques in specific teaching-learning activities. A minimum of ten hours of field experience beyond observation is required.

Educator candidates in the Mississippi University for Women Educator Preparation Program Unit are expected to develop and demonstrate professional competency in the areas represented in the pillars on the model: (a) applying knowledge that is related to content, pedagogy, and content pedagogy; (b) developing self-understanding through guided reflection upon their own practices, beliefs, and skills development; (c)) practicing appropriate teaching, leadership, and professional skills that support positive impact on K-12 student learning; and (d) acquiring and/or refining dispositions that foster learning and positive human relationships, reflect appropriate work and professional ethics, and demonstrate reflection upon their own values and decision making.

Nature of Course Content

MA 319 is designed as a lecture/discussion class that will include lesson demonstrations from the students. Class members will read journals, attend an MCTM conference, prepare two bulletin boards, develop and present a series of lesson plans (called unit portfolios; described below) which demonstrate competency with problem-solving strategies, technology, and manipulatives in classroom presentations and utilizes instructional strategies that facilitate the mathematical learning of diverse (gender,

culture, ethnicity, socioeconomic background, language, special needs, and learning styles) students. All class members must complete a reflective Field Experience Journal in which they describe, analyze and evaluate classroom interactions from their field experiences and reflect on how they would change the experience if it were their classroom or if they were to teach the same activity again. The Professional Portfolio must be presented with at least 8 INT ASC Standards addressed. Class members should be ready for their student teaching experience after this semester.

Grading Scale:

A = 92-100 B = 83-91 C = 74-82 D = 65-73 F = Below 65

Textbooks

Sims, Rod A., and Sims, Charles E. (2002). *Middle School Mathematics: A Survival Guide to Improved Instruction*. The Regency Group. (out of print)

Attendance

Division policy requires that a student attend at least 70% of the classes in any course. This means you may have a maximum of eight absences. In order to receive credit for this course, a student must have at least a 65 average and must have attended at least 70% of the classes. However, you must not earn below a C in this course to remain eligible for licensure.

Cultural Diversity

Mathematics is the great equalizer. It is the belief of the National Council of Teachers of Mathematics that all students can learn mathematics.

Disabilities statement

The university does not discriminate on the basis of disability. Reasonable accommodations will be made for any student with a documented disability. Students in need of special accommodations due to a disability are encouraged to speak with me as soon as possible, so that I can ensure all student needs are met. The student should also contact the Center for Academic Excellence Disability Services Coordinator.

Technology

Manipulatives of all kinds will be used in this course, including graphing calculators. The computer lab will be available to work with sample software programs *(Geometer's Sketchpad)*, and for PowerPoint demonstrations. Educational web sites will be explored and reviewed. Class members will be expected to keep an e-mail journal, which will become the reflective field experiences journal once field placements have been made.

Manipulatives Available

In Parkinson 216: geoboards, two-color counters, pattern blocks, tangrams, pentominoes, color tiles, patty paper, compass and straightedges, MirasTM, geometric solids, Hands-On Equations^C, grouping circles, attribute blocks, Math Explorer calculators, (TI-83 calculators may be loaned to students if they do not yet own their own graphing-capable calculator), Cuisenaire^C rods, fraction circles, base ten (two, three, four, and five) blocks, decks of cards, dice, percent protractors, multilink cubes, Styrofoam balls and pipe cleaners, angle demonstrators, Algeblocks^C, algebra tiles, and the Marilyn Bums video series *Mathematics in the Middle Grades*. In Parkinson 105/107: Geometer's Sketchpad, Maple, Excel, PowerPoint, etc., are available in our computer lab.

Academic Dishonesty

Please check the Student Handbook sections on "Academic Information" and "Student Rights and Responsibilities." MUW is known for high academic standards, ideals, and traditions. Each student in MA 319 is expected to uphold this code: "I pledge myself to uphold the highest standards of honesty in all phases of university life both alone and with many and accept my responsibility for helping others to live up to such standards. All this I will do that my University may become greater, better and more beautiful than when I entered it."

Educator as Reflective Decision Maker: Preparing School Leaders

Every attempt will be made to approach mathematical topics in such a way that the students see the types of decisions required to choose between different teaching techniques. Students should become familiar with common manipulatives used in these topics, and be able to justify using one over another for a particular topic. This course is congruent with the goals of the University and the theme of the teacher education unit: "The Educator as Reflective Decision Maker: Preparing School Leaders." Also, students will show their Certified Background Check cards.

Course Requirements

Students must spend at least 10 hours beyond observation in classrooms. Two tests (a midterm and the final; 25% each) and many projects (discussed below; 50%) will be given during the semester. A tentative schedule is included. There will be no make-up tests. A grade of zero will be assigned for the missed test. Students will join MCTM (\$10), which allows free attendance at the MCTM Conference in Starkville September 14-15, 2012; and students are encouraged to order *Geometer's Sketchpad* directly from the publisher if you wish (just type "geometer's sketchpad" into a search engine); the student edition costs about \$40. Student membership to NCTM is encouraged; this allows on-line access to NCTM's *Principles and Standards of School Mathematics*. Students will show their Certified Background Check cards and proof of liability insurance.

Projects:

Assigned Readings

Your calendar lists the day(s) we will be discussing a particular section in your text. Please read the section BEFORE coming to class for the discussion of that section. You will also have readings from recent issues of *The Mathematics Teacher* or *Mathematics Teaching in the Middle School* to read and respond to in some fashion. These will be discussed in more detail in class, as the semester progresses.

Tutoring

This class has first right of refusal for all tutoring requests. Class members may also tutor for the Center for Academic Excellence. It is assumed that each member will accept at least one such tutoring offer.

Bulletin Boards (5% each)

Each student will prepare two bulletin boards, which will be displayed for two weeks outside our classroom. The topic is open. See the rubric for the required criteria.

Field Experiences (quoting from the *Field Experiences Handbook*) (10%) "Teacher candidates enrolled in MA 319 will spend a minimum of 10 clock hours in a public school classroom performing the tasks outlined below. The 10 hours will be completed over a 10-week period.

1) Teacher candidates will have 10 hours of full classroom teaching experience. The cooperating teacher may help determine how long the student should observe the class before lessons are taught. Teacher candidates may tutor single students, but this will not count towards the 10 required hours of classroom teaching experience. Teacher candidates may grade papers, but this will not count towards the 10 required hours of classroom teaching experience, assist teachers, and then teach lessons.

2) Teacher candidates will give their cooperating teacher a Teaching Evaluation check sheet for assessing the teacher candidate's teaching performance. The completed and signed check sheet will be returned to the university supervisor."

Reflective Field Experiences Journal (10%)

Each class member is responsible for e-mailing <u>boppenheimer@as.muw.edu</u> at least once a week. Your grade here is based simply on whether you managed to maintain contact each week. At first, I will be supplying specific prompts for your thoughts. Once you begin your field experiences, you should describe, analyze and evaluate classroom interactions and reflect on how you would change the experience if it were your classroom or if you were to teach the same activity again.

Unit Portfolio (10%)

Teacher candidates are required to make an instructional portfolio, with objectives keyed to Bloom's Taxonomy, Common Core State Standards, and the NCTM Standards; and instructional procedures linked to one or more multiple intelligence(s). Opportunities for remediation and enrichment must be included. A student survey is required, so that the teacher candidates can get a feeling of the diversity in the mathematics classroom in which they are placed. Concept development with manipulatives is stressed (not just hands-on activities, but minds-on activities are used). Technology usage is encouraged. Secondary majors may do theirs 7-12; mathematics concentration students may do theirs 5-8. The unit portfolio will be graded on a rubric.

Classroom Presentations

Students will prepare a presentation about a mathematical topic from their unit portfolio, from their field experiences, or from other source (e.g., NCTM journals or the Illuminations website). Competency with problem-solving strategies, technology and manipulatives and use of instructional strategies that facilitate the mathematical learning of diverse (gender, culture, ethnicity, socioeconomic background, language, special needs, and learning styles) students should be demonstrated. Lessons will be critiqued.

Professional Portfolio (10%)

Students will present their professional portfolios to be graded on a rubric with 8 INTASC Standards addressed. Possible artifacts from this course are discussed below.

Relationship To Conceptual Framework:

The act of teaching mathematics is a process of decision making that involves interactions with students, parents, and members of the community. This course is designed to acquaint the student with a variety of effective strategies for planning, implementing, and assessing curriculum. Special emphasis is placed on best practices in classroom management.

InTASC Model Core Teaching Standards: April 2011

Standard #1: Learner Development: *The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.*

Either your detailed lesson plan or your unit portfolio may be used here.

Standard #2: Learning Differences: *The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards,*

Either your detailed lesson plan or your unit portfolio may be used here.

Standard #3: Learning Environments: *The teacher works with others to create* environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.

This is best done in ED 409.

Standard #4: Content Knowledge: The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

Either your detailed lesson plan or your unit portfolio may be used here.

Standard #5: Application of Content: The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Either your detailed lesson plan or your unit portfolio may be used here.

Standard #6: Assessment: The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Either your detailed lesson plan or your unit portfolio may be used here, or wait for ED 409.

Standard #7: Planning for Instruction: The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Either your detailed lesson plan or your unit portfolio may be used here.

Standard #8: Instructional Strategies: The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Either your detailed lesson plan or your unit portfolio may be used here.

Standard #9: Professional Learning and Ethical Practice: The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Use evidence from the MCTM meeting for this.

Standard #10: Leadership and Collaboration: *The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.*

Use evidence from the MCTM meeting for this.

Topics & Order Covered; Tentative Test Dates & Topics

The Middle School Math Teacher Creating an Improved Learning Environment Achieving Instructional Success Managing All Those Papers Motivation for Students Who Can-but Won't Know Your Customer Standardized Tests and Other Myths There is No Teaching... Without Discipline The Schizophrenic Mathematics Curriculum

Midterm Wednesday October 3, 2012 How Do You Assign Grades to Students? Cooperative Learning--Paradise Lost or Found? Should I Use Math Manipulatives? Teaching the Gifted and Talented Students Short-Cuts and Time Savers for Teachers Some Final Thoughts About Teaching Final Exam Tuesday 12/04/12 3:00- 6:00 p.m.

MA 319 - projects

- I. Readings:
 - A. Textbooks (the basis for the midterm and final)
 - B. Readings from professional journals

II. Tutoring

- A. College Algebra tutoring through the Center for Academic Excellence
- B. Tutoring community children
- C. AVID tutoring

- III. Bulletin Boards (two) (5% each)
 A. Display on bulletin board outside our classroom in Parkinson Hall
 B. Rubric sheet
- IV. Field Experiences (10%)
 A. At least 10 hours above observation
 B. Evaluation by cooperating teacher and/or university supervisor

V. Unit Portfolio (10%)

A. A one-week set of grade-appropriate lesson plans, complete with pretest, attitude survey, enrichment and remediation, objectives keyed to Bloom's taxonomy, the NCTM *Standards 2000*, the Common Core State Standards, with activities for multiple intelligences, and a test.

VI. Class Demonstrations

A. Lesson plan to be turned in at your presentation

B. 30-minute lesson demonstration with manipulatives and/or graphing calculator

C. Presentation critiqued

VII. Computer Assignment

- A. Geometer's Sketchpad
- B. Finding lesson plans on the Internet
- C. E-mail Reflective Field Experiences Journal (10%)
- VIII. Professional Portfolio (10%)
 - A. Gather artifacts
 - B. Reflection

IX. Other projects

A. Join MCTM (required) and NCTM (optional)

B. Attend the MCTM Conference in Starkville, September 14-15 (one day required)

A Brief Bibliography Of The Knowledge Base That Supports This Conceptual Framework

Burbaker, D. & Simon, L. (1993). Teacher as decision maker. Newbury Park, CA: Corwin Press, Inc

National Council of Teachers of Mathematics. (2000). Principles and Standards for School Mathematics. Reston, VA: NCTM

National Council of Teachers of Mathematics. (1989). Curriculum and Evaluation Standards for School Mathematics. Reston, VA: NCTM.

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). Common Core State Standards Mathematics. Washington D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers

AMTE Journals:

Journal of Mathematics Teacher Education

NCTM Yearbooks:

Multicultural and Gender Equity in the Mathematics Classroom

(1997) Mathematics in the Middle Grades (5-9) (1982)

Teaching Statistics and Probability (1981)

Computers in Mathematics Education (1984)

Learning and Teaching Geometry, K-12 (1987)

.Calculators in Mathematics Education (1992)

The Secondary School Mathematics Curriculum (1985)

The Ideas of Algebra, K-12 (1988)

Teaching and Learning Mathematics in the 1990's (1990)

Discrete Mathematics Across the Curriculum, K-12 (1991)

Assessment in the Mathematics Classroom (1993)

Connecting Mathematics Across the Curriculum (1995)

Communication in Mathematics, K-12 and Beyond (1996)

The Teaching and Learning of Algorithms in School

Mathematics (1998).

etc

NCTM Journals:

Mathematics Teaching in the Middle School; The Mathematics Teacher; Journal for Research in Mathematics Education

PERSONAL INFORMATION

Agnes Miciano-Cariño, Ph.D.

E-mail: <u>amcarino@muw.cdu</u> 600 Cruise St., Starkville, MS 39759, U.S.A. Cellphone: 662-617-0018

EDUCATION

- Ph.D. (Mathematical Sciences), 1995, Mississippi State University, Mississippi State, MS 39762. Dissertation title: Oscillation and asymptotic properties of solutions of higher order delay difference equations.
- M.Sc. (Applied Mathematics), 1990. Mississippi State University, Mississippi State, MS 39762. Thesis: Multiple positive solutions for a class of semi-positone Neumann two point boundary problem.
- **B.Sc. (Statistics)**, 1985. University of the Philippines Los Baños, 4031 College, Laguna, Philippines.

WORK EXPERENCE

- Assistant Professor of Mathematics, Mississippi University for Women, January, 2013 present. Taught Statistics, Intermediate Algebra. Teaching College Algebra, Precalculus, Calculus I and II.
- Adjunct Mathematics Instructor, Mississippi University for Women, August December, 2012. Taught College Algebra.
- Adjunct Mathematics Instructor, Mississippi State University, August, 2012 December, 2012. Taught online classes in Business Calculus and Calculus I and II.
- Freelance tutor, 2001 July, 2012. Tutored a number of students from University of the Philippines Los Banos, Mississippi State University, Starkville School District, Elementary Schools in the Philippines on the following subjects: Elementary Math, Pre-Algebra, Algebra, College Algebra, Trigonometry, CalculusI-IV, Linear Algebra, Differential. Equations, Advanced Calculus, Elementary Statistics.
- Lecturer, Institute of Computer Science, University of the Philippines Los Baños, 11/2000 04/2001. Taught discrete mathematics to computer science majors.
- Head consultant Mathematics Education and Creative Arts, ProTeach Consulting Company, Los Baños, Laguna, Philippines, 2000 - 2001. Responsibilities included conducting short term courses, training and seminar workshops for private and public school teachers and administrators on effective teaching strategies in Math. Taught Math enhancement to preschoolers at the laboratory/pilot school of ProTeach. Was one of the lecturers, facilitators, and organizers at a workshop entitled "The Power and Magic of Storytelling Across the Curiculum" (inspired by the National Storytelling Foundation of USA, Jonesborro, TN) using stories, drama, and music in Math teaching. Taught arts and

crafts at MY BEST SUMMER EVER, a month long summer workshop for children and youth both from the middle class and underserved families with programs on Theater Arts, Creative Visual Arts and Crafts and Speech and Personality Development.

- Resident Mathematician and Office Manager, World Laboratory Research Centre for Fluid Dynamics, University of the Philippines Los Baños, 05/96 - 08/97. Investigated the analytic properties of an integral formulation of hydrodynamics. Helped organize a visit of Nobel Prize Winner Chen Ning Yang and well-known physicist Max Dresden to the Philippines; both of whom delivered lectures to academic constituents and private and business entepreneurs as well. Was involved in a program that recruited special science high school students to pursue a program in engineering. Helped set up a training facility in UPLB for electrical engineering graduates who were recruited, trained, and equipped for a Hongkong-based computer hardware company.
- Graduate Teaching Assistant, Mississippi State University, 08/88 09/95. Taught laboratory class for developmental mathematics, college algebra, trigonometry, finite mathematics, business calculus. Tutored with university-sponsored tutoring sessions for math and non-math majors taking classes in elementary statistics, algebra, trigonometry, Calculus I - IV, differential equations, linear algebra, and Advanced Calculus I & II. Taught algebra for the University Familiarization Program for Minority Engineers during the summer of 1991. Became a representative for the Mathematics and Statistics Department to the Graduate Student Association.
- Instructor of Mathematics, University of the Philippines Los Baños, 11/85 05/88. Taught college algebra, trigonometry, Calculus I II. Served as chairman of socials committee.
- Statistician, National Economic Development Authority, Philippines, 09/85 10/85. Responsible for database management.

AWARDS and **PRIZES**

- Outstanding Teaching Assistant, Department of Mathematics and Statistics Mississippi State University, 1995.
- Best Graduate Student Paper, Annual Meeting of the Louisiana-Mississippi Section of the Mathematical Association of America, Lake Charles, LA, February 22–24,1990.
- Best Graduate Student Paper, Annual Meeting of the Louisiana- Mississippi Section of the Mathematical Association of America, Biloxi, MS, February 24–25, 1989.
- Coconut Farmers Federation of the Philippines Scholarship, 1981–85 (Awarded full scholarship for four-year term of undergraduate degree).

MEMBERSHIPS

- American Mathematical Society (1990 2003).
- Society for Industrial and Applied Mathematics (1995).
- Association for Women in Mathematics (1995).

- Mathematical Association of America (1989 1995).
- Philippine Mathematical Society (1987 1988)

REFEREED FOR THE FOLLOWING JOURNALS

- American Control Conference.
- Proceedings of the First International Conference on Difference Equations.

PUBLICATIONS

- 1. Multiple solutions for a class of semipositone Neumann two-point boundary value problems, with R. Shivaji, Journal of Mathematical Analysis and Applications 178 (1993), 102–115.
- 2. Oscillation and nonoscillation results for nonlinear difference equations with a forcing term, with J.R. Graef, J. Jaros, and P.W. Spikes, Proceedings of the First International Conference on Difference Equations, 1995, 213–222.
- On the asymptotic behavior of solutions of a nonlinear difference equation, with J. R. Graef, P. W. Spikes, P. Sundaram, and E. Thandapani, Proceedings of the First International Conference on Difference Equations, 1995, 223–229.
- 4. (Abstract) A nonoscillation theorem for higher order nonlinear difference equations with a delay, with J. R. Graef, Abstracts of the American Mathematical Society 16 (1995), 114–115.
- 5. Oscillatory and asymptotic behavior of solutions of nonlinear neutral type di?erence equations, with J. R. Graef, P. W. Spikes, P. Sundaram, and E. Thandapani, Journal of the Australian Mathematical Society Series B: Applied Mathematics, 38 (1996), 163–171.
- 6. Classification of nonoscillatory solutions of higher order neutral type difference equations, with J. R. Graef, P. W. Spikes, P. Sundaram, and E. Thandapani, Archivum Mathematicum (Brno) 31 (1995), 263–277.
- 7. Nonoscillation of higher order nonlinear delay difference equations with J. R. Graef, Nonlinear Studies 3 (1996), 173–178.
- Oscillation and nonoscillation results for general nonlinear difference equations with J. R. Graef, J. Jaros, P. W. Spikes, and E. Thandapani, Proceedings of Dynamic Systems and Applications, Volume 2 (1996), 199–206.
- 9. A Sturm type comparison theorem for higher order nonlinear difference equations, with J. R. Graef and C. Qian, Advances in Difference Equations, Proceedings of the Second International Conference on Difference Equations, Gordon and Breach, 1997, 263–270.
- A comparison result for nonlinear difference equations, with J. R. Graef and C. Qian, Nonlinear Analysis 30 (1997), 1547–1553.
- 11. Structure Formation in the One-Dimensional Gravitational Gas, with A. Muriel and R.L. Carino. Astron. Astrophys. 334 (1998), 746–749.
- A general comparison result for higher order nonlinear difference equations with deviating arguments, with J. R. Graef and C. Qian, Journal of Difference Equations and Applications, 8 (2002), 1033–1052.
PRESENTATIONS AT SCIENTIFIC MEETINGS AND CONFERENCES

- 1. Nonorderedness of positive solutions for a class of semipositone problems, presented at the Annual Meeting of the Louisiana–Mississippi Section of the Mathematical Association of America, held in Biloxi, MS, February 23–25, 1989. (Best Graduate Student Paper).
- 2. Multiplicity results for a class of semipositone Neumann two-point boundary value problems, presented at the Annual Meeting of the Louisiana-Mississippi Section of the Mathematical Association of America, held in Lake Charles, LA, February 22-24, 1990. (Best Graduate Student Paper).
- 3. Multiple solutions for a class of semipositone Neumann two-point boundary value problems, presented at the Tenth Annual Southeastern Atlantic Regional Conference on Differential Equations, held in Virginia Polytechnic Institute, Blacksburg, VA, November 16–18, 1990.
- Oscillation and nonoscillation results for nonlinear difference equations with a forcing term, with J. R. Graef, J. Jaros, and P. W. Spikes, invited paper presented at the First International Conference on Difference Equations, Trinity University, San Antonio, Texas, May 25–28, 1994.
- On the asymptotic behavior of solutions of a nonlinear difference equation, with J. R. Graef, P. W. Spikes, P. Sundaram, and E. Thandapani, an invited paper presented at the First International Conference on Difference Equations, Trinity University, San Antonio, Texas, May 25-28, 1994.
- A nonoscillation theorem for higher order nonlinear difference equations with a delay, with J. R. Graef, an invited address presented in the Special Session "Difference Equations: Theory and Applications" at the 101st Annual Meeting of the American Mathematical Society, in San Francisco, California, January 4–7, 1995.
- Sufficient conditions for solutions of a nonlinear difference equations to have a certain asymptotic behavior, with J. R. Graef, P. W. Spikes, P. Sundaram, and E. Thandapani, presented at the Second Mississippi State Conference on Differential Equations and Computational Simulations, Starkville, Mississippi, April 7–8, 1995.
- Oscillation and nonoscillation results for general nonlinear difference equations, with J. Jaros, J. R. Graef, P. W. Spikes, and E. Thandapani, an invited address presented in the Special Session "Discrete and Continuous Dynamic Systems" at the Second International Conference on Dynamic Systems and Applications, held at Morehouse College, Atlanta, Georgia, May 24–27, 1995.
- A Sturm type comparison theorem for higher order nonlinear difference equations, with J. R. Graef and C. Qian, an invited paper presented at The Second International Conference on Difference Equations and Applications, held at the University of Veszpr'em, Veszpr'em, Hungary, August 7–11, 1995.
- A comparison result for nonlinear difference equations, with J. R. Graef and C. Qian, an invited paper presented in the Special Session "Nonlinear Oscillations" at the Second World Congress of Nonlinear Analysts, in Athens, Greece, July 10–17, 1996.

OTHER PROFESSIONAL MEETINGS ATTENTED

- 1. Annual Meeting of the Louisiana–Mississippi Section of the Mathematical Association of America, held in Biloxi, MS, February 28–March 2, 1991.
- 2. Second International Conference on Industrial and Applied Mathematics, Washington, D. C., July 8–11, 1991, funded by the National Science Foundation.
- Eleventh Annual Regional Southeastern-Atlantic Regional Conference on Differential Equations, Mississippi State University, Starkville, MS, October 25–26, 1991.
- 4. First Mississippi State Conference on Differential Equations and Computational Simulations, Mississippi State University, Starkville, MS, March 19–20, 1993.
- 5. International Conference on Functional and Global Analysis, U.P. Diliman, Philippines, October 21–25, 1996.
- MAA LA-MS Section Meeting, University of Southern Mississippi, Hattiesburg, MS, February 28 – March 2, 2013.

LECTURE PRESENTATION

Enrollment Planning, presented at Maejo University, Chiangmai, Thailand, March 2011

Susan Ficken

520 10th st South, Apt 18 Columbus, MS, 39701 (607)-339-1501 (cell) smficken@muw.edu

Education

Northern Illinois University, Dekalb, Illinois Ph.D. Mathematics (topic: asymptotics of zeros of Fine's basic hypergeometric series) May 2013

Northern Illinois University, Dekalb, Illinois M.S. Mathematics August 2007

University of Wisconsin - River Falls, River Falls, Wisconsin B.S. Mathematics (Honors) (minors: German, Agriculture, International Studies) May 2005

Budapest Semesters in Mathematics, Budapest, Hungary Fall 2004

Work Experience

Aug 2013 - Present Assistant Professor – Mississippi University for Women Courses taught: Intermediate Algebra Precalculus Trigonometry Modern Algebra

Aug 2005-May 2013

Graduate Teaching Assistant -- Northern Illinois University

Courses taught with full responsibility (including constructing and grading exams):

Fundamentals of Math II (Intermediate Algebra; special admissions program for academically underprepared urban students)

Precalculus Calculus I Calculus II

Courses assisted:

Core Competency in Mathematics (quantitative literacy course for non-math majors) Precalculus

Calculus for Business and Social Sciences

Honors Calculus I

Other assignments:

Walk-in tutoring lab -- provided assistance for students as required, up through calculus.

May 2008-Oct 2008 Intern -- Argonne National Laboratory Initiated development of a Mathematica-based text mining system.

Sep 2003-May 2005

Tutor -- University of Wisconsin, River Falls Provided walk-in tutoring assistance for students up through calculus 2.

Summer 2004 Summer undergraduate research experience at University of Nebraska-Lincoln Topic: Evolutionary Game Theory and the evolution of cooperation and altruism.

Awards

Certificate of Teaching Excellence -- NIU

Presentations

Mar 2009 "Development of a Mathematica-based text mining system"

Memberships

MAA, AMS, SIAM, Sigma Xi

Additional Information

I have a reading-level proficiency in German. I am also competent in LaTeX, Mathematica, and Microsoft Office.

Joshua Owen Hanes

Mississippi University for Women 1100 College Street, W-100 Columbus, MS 39701 Phone: (662) 329-7237 Email: johanes@muw.edu

Research Areas

- Graph Theory
- Combinatorics
- Modern Algebra

Education

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University of Mississippi	
Doctor of Philosophy, Mathematics, GPA 3.6 May 2008	Oxford, MS
Dissertation: Distance Graphs on the Integers	
University of Mississippi	
Masters of Science, Mathematics, GPA 3.5 May 2002	Oxford, MS
Thesis: Szemeredi's Regularity Lemma	
Millsaps College	
Bachelor of Science, GPA 3.8 Magna Cum Laude with honors May 2000	Jackson, MS
 Related Skills Knowledge of BASIC, HTML, Pascal, Mathematica, TeX, LaTeX, and Joon 	nla; Microsoft Office:
 Word, Excel, and Power Point proficient; Computer hardware and software to Detail oriented, possessing the ability to identify, analyze and solve problem 	roubleshooter. s.
 Motivate individuals to increase enciency, quality of service, and productiv turnover and progressive individual development. 	ity resulting in lower
Employment and Experience	
Mississippi University for Women	
Assistant Professor of Mathematics 08/2008-Present	Columbus, MS
Teaching:	
 Responsible for making and giving of lectures, tests, and homework for 75-1 semester, as well as keeping track of students' progress and academic record 	25 students per s.
 Taught over 53 courses in Intermediate Algebra, College Algebra, Trigonom 	etry, Pre-Calculus,
Calculus 1, 3, and 4, Concepts of Advanced Mathematics, Linear Algebra, D	iscrete Mathematics,
Real Analysis, and University Life.	
 Coordinated College Algebra and Intermediate Algebra courses at MUW. 	
Service to the University:	
Mississippi NASA Space Grant 2012-Present	
 The Mississippi NASA Space Grant provides Mississippi University for Wor annually to support student research opportunities and faculty professional detection 	nen with \$10,000 evelopment.
 Writes annual grant proposals. 	

Writes annual grant proposals.
Distributes grant moneys as decided by a committee of fellow professors.

Maintain Departmental Website 2012-Present

Maintain Departmental Distribution Lists 2012-Present

Institutional Review Board 2011-Present

- Review and approve student and faculty research projects based on university guidelines.
- Create and maintain fillable forms for use by researchers.

Undergraduate Curriculum Committee 2011-Present

- Review and approve faculty requests for changes to curriculum requirements.
- Create and maintain fillable forms for use by faculty.
- Course Coordinator 2011-Present
- Set up all Intermediate Algebra and College Algebra courses using the Hawkes Learning Systems software.
- Plan, in consultation with other faculty, the course content, tests, and syllabi for all instructors.
- Provide basic Hawkes software support to all instructors and student tutors.
- Contact Hawkes Learning Systems for technical support and to organize training sessions for all instructors.

Mathematics Lab Tutor Coordinator 2010-Present

- Hire and train new student tutors in the mathematics lab used for Intermediate Algebra and College Algebra courses.
- Schedule tutors' work hours in the mathematics lab.
- Organize the mathematics lab.

Academic Advisor

2009-Present

Work with mathematics majors to plan out their schedules so they can meet their graduation goals. Faculty Advisor, Kappa Mu Epsilon 2009-Present

Facilitate and monitor meetings of the mathematical honor society, Kappa Mu Epsilon (KME). Science Bowl Timekeeper 2009-Present

- Mathematics Faculty Search Committee 2011-2013
- Conducted telephone interviews with references.
- Conducted in-person interviews at the Joint AMS and MAA Meetings in Boston, 2012. .
- . Took candidates out to dinner, drove them to and from their hotels, and helped them during their time on campus.
- 2012-2013 search resulted in two successful hires. .
- Sonya Kovalevsky Day Presenter 2010, 2011, 2013
- Co-coordinator for 2013 Sonya Kovalevsky Day
- Science and Math Seminar Presenter 2010, 2011
- Course Redesign Committee 2008-2010
- Helped implement the Replacement Model as outlined by the National Center for Academic ٠ Transformation in our Intermediate Algebra and College Algebra courses.

University of Mississippi

Graduate Teaching Assistant

- Responsible for making and giving of lectures, tests, and homework for 55-100 students per . semester, as well as keeping track of students' progress and academic records.
- Taught over 18 courses in Statistics, College Algebra, Calculus 1 & 2, Business Calculus 1 & 2. .
- Tutored for courses in Statistics, College Algebra, Calculus 1-4, Business Calculus 1& 2, Finite Mathematics, Complex Analysis, Real Analysis, Discrete Mathematics, Modern Algebra.

McNair Scholar mentor 2002 Oxford, MS

Responsible for overseeing a McNair Scholar student's progress, guiding them in their research, helping them to understand graph theory and the programming language Tex. 08/2004-06/2005

Computer Technician

- Repaired and rebuilt broken Math Department computers. .
- Data recovery of failed hard drives.

Publications

- Modular Distance Labelings of Graphs, Joshua Hanes, MUW; Tristan Denley, University of Mississippi. Combinatorics Probability and Computing (2014 pending review)
- Distance Labelings of Trees, Joshua Hanes, MUW; Tristan Denley, University of Mississippi. Combinatorics Probability and Computing (2014 pending review)

154

Oxford, MS

Oxford, MS

08/2000-05/2008

- The Number of Admissible Sequences for Indecomposable Serial Rings. Joshua Hanes, University of Mississippi; Darren Wick, Ashland University. Missouri Journal of Mathematical Sciences, Volume 18 Issue #2 - Spring 2006
- The Number of Admissible Sequences For Indecomposable Serial Rings With a Simple Projective Module, Joshua Hanes, University of Mississippi; Darren Wick, Ashland University. Proceedings of the Louisiana-Mississippi Section of the MAA (Spring 2000)

Presentations

- "Modular distance labelings of graphs," Joint AMS and MAA Meetings; Boston (January 2012)
- "Distance labelings of trees," Session Chair, Joint AMS and MAA Meetings; New Orleans (January 2011)
- "Distance graphs on the integers," invited speaker; University of Montevallo (Spring 2009)
- "Distance graphs on the integers," colloquium series; University of West Florida (Fall 2008)
- "Distance graphs on the integers," Joint AMS and MAA Meetings; New Orleans (January 2007)
- "How to Solve a Rubik's Cube," Pi Mu Epsilon Meeting University of Mississippi (October 2004)
- "On Szemeredi's Regularity Lemma," The University of Mississippi graduate seminars (October 2003)
- "The Number of Admissible Sequences For Indecomposable Serial Rings With a Simple Projective Module," Louisiana-Mississippi Section of the MAA (Spring 2000)

Collaboration with Hawkes Learning Systems

Summer 2010-Present

- Works closely with Hawkes Learning Systems representatives to improve their product and to ensure MUW mathematics instructors are comfortable with the software.
- Proposed, and continues to advise Hawkes developers regarding, a positive reinforcement method currently being refined that will encourage students to spend more time with the software to reinforce key academic concepts. (2010-Present)
- Reviewed and beta-tested Hawkes' web-based product. (2013)
- Reviewed revisions to Hawkes' college algebra textbook, <u>College Algebra, A Concise Approach</u> (published 2012)
- Worked with a Hawkes Learning Systems representative to organize a trip to their headquarters in South Carolina; MUW mathematics faculty met with Hawkes writers, programmers, and lead designers to discuss current and future improvements to the software. (2010)

Fellowships, Scholarships, Honors, and Awards

NExT Fellow	2010-2011	MAA
Graduate Research fellowship	2007	University of Mississippi
Summer Navy Grant	2001-2003	University of Mississippi
Honors Scholarship	2000-2002	University of Mississippi

Conferences

- Louisiana/Mississippi Section of the MAA; 2009, 2010, 2011, and 2013
- Joint AMS and MAA meeting; New Orleans 2001, 2007, and 2011, and Boston 2012
- The 41st Mighty Conference Midwest Graph Theory; Middle Tennessee State University 2005
- 35th Southeastern Conference on Combinatorics, Graph Theory, and Computing; Florida Atlantic University 2004
- 16th Cumberland Conference on Combinatorics, Graph Theory, and Computing; Georgia State University 2003
- Spring sectional meeting of the MAA; Louisiana State University 2003

- Paul Erdos Lecture Series; University of Memphis 2001 & 2002
- The 15th Cumberland Conference on Combinatorics, Graph Theory, and Computing; University of Mississippi 2002
- Matroid Structure Theory Conference; Ohio State University 2002
- Louisiana-Mississippi Section of the MAA 1997-2001

Professional Organizations

American Mathematical Society (AMS) Mathematics Association of America (MAA)

- Regional Liaison, 2011-Present
- New Experiences in Teaching (NExT) Fellow, 2010-2011

Pi Mu Epsilon

References available upon request.

Dorothy Anne Kerzel

Department of Sciences and Mathematics Mississippi University for Women 1100 College Street, W-100 Columbus, MS 39701 (662) 329-7330 e-mail: dkerzel@as.muw.edu

Education

Washington State University, Doctor of Philosophy, Mathematics, 1997 University of Wisconsin - Madison, Master of Arts, Mathematics, 1986 Lewis and Clark College, Bachelor of Science, Mathematics, 1983

Teaching and Administrative Experience

Mississippi University for Women (MUW), August 1997 - present Professor, Department of Sciences and Mathematics, August 2005 - present Chair, Department of Sciences and Mathematics, July 2005 - June 2011 Interim Dean, College of Arts and Sciences, July 2006 - June 2007 Head, Division of Science and Mathematics, July 2004 - June 2005 Interim Head, Division of Science and Mathematics, July 2003 - June 2004 Associate Professor, Division of Science and Mathematics, August 2002 - July 2005 Assistant Professor, Division of Science and Mathematics, August 1997 - July 2002

Washington State University, August 1991 - May 1997 Teaching Assistant, Department of Pure and Applied Mathematics

Alma College, August 1987 - May 1991 Instructor, Department of Mathematics and Computer Science

Lawrence University, September 1986 - June 1987 Lecturer, Department of Mathematics

University of Wisconsin - Madison, September 1983 - May 1986 Teaching Assistant, Department of Mathematics

Faculty Award

Kossen Faculty Excellence Award, 2009. An annual award based on a nomination process with a \$5000 stipend, honoring a meritorious faculty member who has exhibited excellence in teaching, scholarly achievement, and service.

Courses Taught

- Number Theory
- Mathematical Statistics
- Discrete Mathematics
- Combinatorics
- Probability Theory
- Differential Equations
- Abstract Algebra
- Calculus I, II, III, IV
- Business Calculus
- Precalculus
- Trigonometry
- College Algebra
- Introductory Statistics

Grant Involvement

Completed grants:

- Principal Investigator on the congressional grant Science and Mathematics on the Tennessee-Tombigbee Waterway; congressional grant awarded for the period 8/1/2010 – 7/31/2013 for science and mathematics enrichment activities for students and teachers; funded by the U.S. Department of Education (\$200,000)
- Principal Investigator on the congressional grant Science Education on the Tennessee-Tombigbee Waterway; congressional grant awarded for the period 9/1/2009 – 8/31/2013 for science enrichment activities for students and teachers; funded by the National Oceanic and Atmospheric Administration (\$374,625)
- Principal Investigator of the congressional grant *Science on the Tennessee-Tombigbee Waterway*; congressional grant awarded for the period 9/2008-9/2010 for science enrichment activities for teachers and students (\$191,593)
- Principal Investigator of the congressional grant *Historical and Scientific Enrichment Project at Plymouth Bluff* and the MUW Explorer (pontoon boat); no-cost extension for the period 8/16/08-8/15/09; planned and executed summer workshops for teachers and students and fall Saturday workshops for teachers (\$46,812)
- Principal Investigator on grant proposal to the Course Redesign Initiative through the Mississippi Institutes of Higher Learning (IHL) and the National Center for Academic Transformation to redesign MA 100 Intermediate Algebra and MA 113 College Algebra; pilot phase in Spring 2009 and full implementation in Fall 2009; (\$50,000)
- Instructor and Project Coordinator for *Summer Institute for Teacher Excellence*, a joint project between MUW and the Mississippi School for Mathematics and Science, funded by IHL Title II, Summer 2004

Publications

Calculus Notebooks with Mathematica, K. Cooper, S. Cooper, B. Greenough, D. Kerzel, T. LoFaro, Simon and Schuster Custom Publishing, 1997

Presentations

- Hands-On Geometry Activities, Mississippi Council of Teachers of Mathematics annual meeting, November 2001
- Fair and Unfair Games, Mississippi Council of Teachers of Mathematics annual meeting, November 1999
- Pieces of π , MUW Division of Science and Mathematics Seminar, March 1999
- Induction in a Variety of Mathematical Settings, Mississippi Council of Teachers of Mathematics annual meeting, October 1998
- The Pigeonhole Principle, Mississippi Council of Teachers of Mathematics annual meeting, October 1998
- A Laboratory Component for Calculus I, II, and III using Mathematica Notebooks, Ninth Annual International Conference on Technology in Collegiate Mathematics, November 1996
- Combinatorial Methods for Splitting Necklaces, Sixth International Conference on Fibonacci Numbers and Their Applications, July 1993

Programs and Workshops

- Presented a statistics overview and review to students in the Bachelor of Science in Nursing program; 2009 and 2010
- Faculty Consultant for Educational Testing Services, Advanced Placement Reader for Calculus, June of each year from 1999 through 2007; Table Leader 2006 through 2007
- Presented Origami Boxes, Sonia Kovalevsky High School Mathematics Day, co-presenter Tess Creel, April 2006
- Organized a problem solving competition, Sonia Kovalevsky High School Mathematics Day, April 2006
- Presented *Constructing with Origami*, part of "Yes, She Can: The House that Jill Built", co-presenter Tess Creel, four sessions for the cooperative program between MUW and the Girl Scouts of Northeast Mississippi, November 2005
- Instructor for a content course for teacher enhancement under Creating High Achievement in Mathematics Problem solving and Science (CHAMPS II), funded by a grant from the Mississippi Department of Education, July 2004
- Instructor for a content course for teacher enhancement under Summer Institute for Teacher Excellence (SITE), funded by a grant from the IHL, June 2004
- Organized a problem solving competition, Sonia Kovalevsky High School Mathematics Day, Spring 2004
- Presented Number Patterns and Error Detecting Codes, Sonia Kovalevsky High School Mathematics Day, Spring 2003
- Instructor for a weeklong residential mathematics camp for middle and high school students, June 2002
- Presented Origami Boxes, Sonia Kovalevsky High School Mathematics Day, April 2002
- Instructor for a three week enhancement workshop for high school mathematics teachers *Making Mathematics Meaningful*, funded by an Elsenhower grant, June 2001
- Instructor for a weeklong residential mathematics camp for middle and high school students, partial funding from the NASA Space Grant Consortium, June 2001
- Presented Voting Systems, Sonia Kovalevsky High School Mathematics Day, March 2001

- Instructor for a weeklong mathematics camp for 8th grade girls, funded by a Tensor grant through the Mathematical Association of America, June 2000
- Presented Probability Pi, Sonia Kovalevsky High School Mathematics Day, April 2000
- Attended Statistical Thinking with Active Teaching Strategies: Workshops for Mathematicians Who Teach Statistics, November 1999
- Presented Fair and Unfair Games, Sonia Kovalevsky High School Mathematics Day, March 1999
- Presented on career opportunities in mathematics, Sonia Kovalevsky High School Mathematics Day, March 1998
- Instructor for a weeklong teacher enhancement workshop *MUW/MSMS Math & Science Project* for 7th and 8th grade teachers, funded by an Eisenhower grant, July 1998

University Service (MUW)

University Committees and Service:

Scholastic Appeals Committee (chair 2007-present); Nursing College Advisory Board (2012present); SACS Financial and Physical Resources Subcommittee (2012-2013); Council of Department Chairs (2007-2011, chair 2007-2009); Undergraduate Curriculum Council (2009-2011, chair 2010-2011); Teacher Education Council (2003-2011); Academic Council (2003-2005, 2006-2009); Administrative Council (2006-2009); Faculty Advising Corps (1998-2007); Search Committee (2006 Vice President for Academic Affairs/Provost); Academic Master Plan Committee (2004-2006); Faculty Appeals Committee (2002-2006); Search Committee (2004 Vice President for Academic Affairs/Provost); Planning and Institutional Effectiveness Council (2000-2003); Faculty Library Advisory Committee (1997-2003); Search Committee (2002-2003 Dean of Enrollment Management); Academic Calendar Committee (2001-2002); SACS Administrative Process/Physical Resources Committee (2001-2002); Spirit Award Committee (2001)

Departmental/Divisional Committees and Service:

Mississippi Regional Science Bowl volunteer (2002-present); Mississippi Regional Science Bowl organizational committee member (2007-present); Seminar Committee (member 1999-2011, chair 2000-2011); Tenure, Promotion, and Post Tenure Review Committee (2002-2005); Faculty Search Committee (1997-1998 mathematics, 1999-2000 chemistry, 2000-2001 biology, 2000-2001 division head, 2007-2008 mathematics, 2007-2008 biology, 2010-2011 biology education; 2011-2012 biology education; 2011-2012 mathematics, 2012-2013 mathematics); Co-advisor for mathematics competition team (2001-2008); Architects Committee (1999-2003)

Bonnie L. Oppenheimer, Professor

Department of Sciences and Mathematics boppenheimer@as.muw.edu (662) 329-7239 1100 College Street Box W-100 Mississippi University for Women Columbus, MS 39701

Academic Degrees

- Ph.D. 1992 Mathematics Education, The University of Texas at Austin
- M.A. 1991 Mathematics (minor: Statistics), Mississippi State University
- M.A.T. 1979 Mathematics, The University of Chicago
- B.M. 1978 Performance (Oboe), Baldwin-Wallace College
- B.S. 1978 Mathematics, Baldwin-Wallace College

Recent Professional Experience

2011—	Associate Department Chair for the Department of Sciences and	
	Mathematics: Mississippi University for Women	
2006—	Professor, Department of Sciences and Mathematics: Mississippi	
	University for Women (Faculty Member of the Year 2009)	
2003-2006	Associate Professor, Division of Science and Mathematics: Mississippi	
	University for Women	
19982003	Assistant Professor, Division of Science and Mathematics; Adjunct	
	Faculty, Division of Fine and Performing Arts: Mississippi University for	
	Women	
2002	Consultant, Math Connections: Mississippi School for Mathematics and	
	Science	
2001	Consultant, Institute for Algebra and Quantitative Literacy: Mississippi	
	State University	
2000—2004	Director of MAA/Tensor Foundation/MUW Math Camp; Director of	
	NASA Space Grant/MUW Geometry Camp; Director of Math Camp	
	2002; Director of Math Camp 2003; Director of Math Camp 2004	
1998—2000	Adjunct faculty, Graduate Program in Education: Nova Southeastern	
	University	
1995—1998	Consultant, Teacher Networking and Design Center and MATH	
	PLACE: Mississippi State University	
1994—1998	Classroom teacher, Starkville High School: Starkville Public School	
	District, Starkville, MS	
1994—1998	Adjunct faculty, Mathematics Department: East Mississippi Community	
	College—Columbus Air Force Base	
1992-1994	Mathematics educator, Delta Mathematics Project; Assistant professor,	
	Mathematics Department; Adjunct faculty, Music Department: Delta State	
	University	
1989—1991	Instructor/Teaching assistant, Department of Mathematics and Statistics:	
	Mississippi State University	
1989	Part-time instructor, Mathematics Department: East Mississippi	
	Community College—Golden Triangle Campus	
1988—1989	Classroom teacher, Starkville High School: Starkville Public School	
	District, Starkville, MS	
Professional Licensure: State of Mississippi 7-12 Mathematics		

Selected Publications and Grants

Nicholson, J., S. Warren, B. Oppenheimer, M. Goodman, J. Codling, T. Robinson, and J. Young Chung. "STEM Research: What the Pictures Tell Us." *The International Journal of Science in Society* 4(1) (2012) 1-14.

Oppenheimer, B., S. Cho, M. Goodman, J. Codling, T. Robinson, , and T. Wheeler. "Stem Images." 2008 Proceedings of the LA/MS Section of the MAA http://sections.maa.org/lams/proceedings/spring2008/Oppenheimer%20Revised.pdf

S. Cho, M. Goodman, B. Oppenheimer, J. Codling and T. Robinson, Images of women in

STEM fields, Jcom 08(03) (2009) A03.

Selected Grants

Mississippi Space Grant Consortium (Funded for \$2000) Mississippi Space Grant Consortium (Funded for \$3300) AAUW CAP Grant (Funded for \$2100)

Selected Recent Presentations

October, 2013: "Cuisenaire Rod Patterns." Sonia Kovalevksy Day, Mississippi University for Women, Columbus, Mississippi

September, 2013: "More Fun with Fractions (and what the CCSS-M says about them)." Mississippi Council of Teachers of Mathematics, Gulfport, Mississippi.

July, 2013: "More Fun with Fractions." Week-long 3-hour workshop for 3-5 graders, Science Enrichment Program, Columbus, Mississippi.

June, 2013: "Creating a Collaborative Common Core Classroom." Month-long workshop for in-service teachers, Columbus, Mississippi

November, 2012: "Race and Gender Differences in Assessments of STEM and non-STEM Images." International Conference on Science in Society, Berkeley, California (presented by Shane Warren)

September 16, 2012: "A Jog Through the Common Core State Standards, K-2." Mississippi Council of Teachers of Mathematics, Starkville, Mississippi

July 9 – 13, 2012: "Mathematics Mania: Fun with Fractions." Three days with teachers; two days with teachers and Grades 3-5 students. Science Enrichment Program, Columbus, Mississippi

June 14 & 15, 2012: "Algebra Access: Foundations" for 6-8 graders, 3 hours a day. Science Enrichment Program, Columbus, Mississippi

Selected Professional Affiliations

National Council of Teachers of Mathematics; Association of Mathematics Teacher Educators; Mississippi Association of Mathematics Teacher Educators (treasurer); Mathematical Association of America; Association for Women in Mathematics; American Mathematical Association; American Association of University Women (Starkville Branch President; Columbus-MUW Branch C/U Rep; Mississippi Membership Vice-President); Mississippi Professional Educators; Musician's Union (Principal Oboe: Starkville/Mississippi State University Symphony)

Awards

2008-2009 MUW Faculty Member of the Year; 2009-2010 Lowndes County Educator of the Year (Postsecondary); 2009-2010 MCTM College/University Mathematics Teacher of the Year

NCTM NCATE Mathematics Content for Secondary Addendum to the NCTM NCATE Standards 2012

A. Secondary Mathematics Teachers

All secondary mathematics teachers should be prepared with depth and breadth in the following mathematical domains: Number, Algebra, Geometry, Trigonometry, Statistics, Probability, Calculus, and Discrete Mathematics. All teachers certified in secondary mathematics should know, understand, teach, and be able to communicate their mathematical knowledge with the breadth of understanding reflecting the following competencies for each of these domains.

A.1. Number and Quantity

To be prepared to develop student mathematical proficiency, all secondary mathematics teachers should know the following topics related to number and quantity with their content understanding and mathematical practices supported by appropriate technology and varied representational tools, including concrete models:

- A.1.1 Structure, properties, relationships, operations, and representations including standard and non-standard algorithms, of numbers and number systems including integer, rational, irrational, real, and complex numbers
- A.1.2 Fundamental ideas of number theory (divisors, factors and factorization, primes, composite numbers, greatest common factor, least common multiple, and modular arithmetic)
- A.1.3 Quantitative reasoning and relationships that include ratio, rate, and proportion and the use of units in problem situations
- A.1.4 Vector and matrix operations, modeling, and applications
- A.1.5 Historical development and perspectives of number, number systems, and quantity including contributions of significant figures and diverse cultures

A.2. Algebra

To be prepared to develop student mathematical proficiency, all secondary mathematics teachers should know the following topics related to algebra with their content understanding and mathematical practices supported by appropriate technology and varied representational tools, including concrete models:

- A.2.1 Algebraic notation, symbols, expressions, equations, inequalities, and proportional relationships, and their use in describing, interpreting, modeling, generalizing, and justifying relationships and operations
- A.2.2 Function classes including polynomial, exponential and logarithmic, absolute value, rational, and trigonometric, including those with discrete domains (e.g., sequences), and how the choices of parameters determine particular cases and model specific situations

- A.2.3 Functional representations (tables, graphs, equations, descriptions, recursive definitions, and finite differences), characteristics (e.g., zeros, intervals of increase or decrease, extrema, average rates of change, domain and range, and end behavior), and notations as a means to describe, reason, interpret, and analyze relationships and to build new functions
- A.2.4 Patterns of change in linear, quadratic, polynomial, and exponential functions and in proportional and inversely proportional relationships and types of real-world relationships these functions can model
- A.2.5 Linear algebra including vectors, matrices, and transformations
- A.2.6 Abstract algebra, including groups, rings, and fields, and the relationship between these structures and formal structures for number systems and numerical and symbolic calculations
- A.2.7 Historical development and perspectives of algebra including contributions of significant figures and diverse cultures

A.3. Geometry and Trigonometry

To be prepared to develop student mathematical proficiency, all secondary mathematics teachers should know the following topics related to geometry and trigonometry with their content understanding and mathematical practices supported by appropriate technology and varied representational tools, including concrete models:

- A.3.1 Core concepts and principles of Euclidean geometry in two and three dimensions and two-dimensional non-Euclidean geometries
- A.3.2 Transformations including dilations, translations, rotations, reflections, glide reflections; compositions of transformations; and the expression of symmetry in terms of transformations
- A.3.3 Congruence, similarity and scaling, and their development and expression in terms of transformations
- A.3.4 Right triangles and trigonometry
- A.3.5 Application of periodic phenomena and trigonometric identities
- A.3.6 Identification, classification into categories, visualization, and representation of two- and three-dimensional objects (triangles, quadrilaterals, regular polygons, prisms, pyramids, cones, cylinders, and spheres)
- A.3.7 Formula rationale and derivation (perimeter, area, surface area, and volume) of two- and three-dimensional objects (triangles, quadrilaterals, regular polygons, rectangular prisms,

pyramids, cones, cylinders, and spheres), with attention to units, unit comparison, and the iteration, additivity, and invariance related to measurements

- A.3.8 Geometric constructions, axiomatic reasoning, and proof
- A.3.9 Analytic and coordinate geometry including algebraic proofs (e.g., the Pythagorean Theorem and its converse) and equations of lines and planes, and expressing geometric properties of conic sections with equations
- A.3.10 Historical development and perspectives of geometry and trigonometry including contributions of significant figures and diverse cultures

A.4. Statistics and Probability

To be prepared to develop student mathematical proficiency, all secondary mathematics teachers should know the following topics related to statistics and probability with their content understanding and mathematical practices supported by appropriate technology and varied representational tools, including concrete models:

- A.4.1 Statistical variability and its sources and the role of randomness in statistical inference
- A.4.2 Creation and implementation of surveys and investigations using sampling methods and statistical designs, statistical inference (estimation of population parameters and hypotheses testing), justification of conclusions, and generalization of results
- A.4.3 Univariate and bivariate data distributions for categorical data and for discrete and continuous random variables, including representations, construction and interpretation of graphical displays (e.g., box plots, histograms, cumulative frequency plots, scatter plots), summary measures, and comparisons of distributions
- A.4.4 Empirical and theoretical probability (discrete, continuous, and conditional) for both simple and compound events
- A.4.5 Random (chance) phenomena, simulations, and probability distributions and their application as models of real phenomena and to decision making
- A.4.6 Historical development and perspectives of statistics and probability including contributions of significant figures and diverse cultures

A.5. Calculus

To be prepared to develop student mathematical proficiency, all secondary mathematics teachers should know the following topics related to calculus with their content understanding and mathematical practices supported by appropriate technology and varied representational tools, including concrete models:

- A.5.1 Limits, continuity, rates of change, the Fundamental Theorem of Calculus, and the meanings and techniques of differentiation and integration
- A.5.2 Parametric, polar, and vector functions
- A.5.3 Sequences and series
- A.5.4 Multivariate functions
- A.5.5 Applications of function, geometry, and trigonometry concepts to solve problems involving calculus
- A.5.6 Historical development and perspectives of calculus including contributions of significant figures and diverse cultures

A.6. Discrete Mathematics

To be prepared to develop student mathematical proficiency, all secondary mathematics teachers should know the following topics related to discrete mathematics with their content understanding and mathematical practices supported by appropriate technology and varied representational tools, including concrete models:

- A.6.1 Discrete structures including sets, relations, functions, graphs, trees, and networks
- A.6.2 Enumeration including permutations, combinations, iteration, recursion, and finite differences
- A.6.3 Propositional and predicate logic
- A.6.4 Applications of discrete structures such as modeling and solving linear programming problems and designing data structures
- A.6.5 Historical development and perspectives of discrete mathematics including contributions of significant figures and diverse cultures

CBMS - The Mathematical Education of Teachers II

Chapter 6 Appendix: Sample Undergraduate Mathematics Sequences

Short sequence (33 semester-hours).

- I Courses taken by undergraduates in a variety of majors (15+ semesterhours)
 - Single- and Multi-variable Calculus (9+ semester-hours)
 - Introduction to Linear Algebra (3 semester-hours) Introduction to Statistics (3 semester-hours)

II Courses intended for all mathematics majors (9 semester-hours)

- Introduction to Proofs (3 semester-hours)
- Abstract Algebra (approach emphasizing rings and polynomials) (3 semester-hours)
- A third course for all mathematics majors (e.g., Differential Equations) (3 semester-hours)
- III Courses designed primarily for prospective teachers (9 semester-hours).

Long sequence (42 semester-hours).

- I Courses taken by undergraduates in a variety of majors (21 semesterhours)
 - Single- and Multi-variable Calculus (9+ semester-hours)
 - Introduction to Linear Algebra (3 semester-hours)
 - Introduction to Computer Programming (3 semester-hours)
 - Introduction to Statistics I, II (6 semester-hours)

II Courses intended for all mathematics majors (12 semester-hours)

- Introduction to Proofs (3 semester-hours)
- Advanced Calculus (3 semester-hours)
 - Abstract Algebra (approach emphasizing rings and polynomials) (3 semester-hours)
- Geometry or Mathematical Modeling (3 semester-hours)
- III Courses designed primarily for prospective teachers (9 semester-hours).

Conference Board of the Mathematical Sciences (CBMS). (2012). The Mathematical Education of Teachers II. Issues in Mathematics Education, Vol. 17. Washington, DC: American Mathematical Society.

9