

Mathematics and Science Education PhD Student Handbook

DEPARTMENT OF TEACHING AND LEARNING



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Welcome and Introduction

The Department Chair

Dr. Darcy Miller

I would like to take this opportunity to welcome you to the Department of Teaching and Learning graduate program. The faculty supports a strong program of mentorship and encourages doctoral students to work closely with faculty of their choosing in investigating the world of research, knowledge generation and dissemination, pedagogical action, and advocacy.

We have extremely talented and knowledgeable faculty in the Department. The faculty are both excellent teachers and superb researchers. They are closely connected to the K-12 public school system, and also active contributors to research in their respective fields. The faculty conduct a wide range of research, some of which is integrated into the public school systems (e.g., writing interventions for students with disabilities, professional development for teachers) and some that is community-based (e.g., support for parents with children who have Autism). You have access to these faculty and their projects through course work and advising structures. Seek out this faculty expertise in teaching and research.

Please read through this handbook. It is designed to help you navigate all the transitions, procedures, and processes that graduate education involves. Discuss the items in this handbook with your advisor and graduate committee. Be aware of the deadlines described in the handbook.

We strive to facilitate and support a collaborative, positive, and productive culture for our graduate students. We are here to help you achieve your graduate goals. The faculty and staff in the xxx Program and in the Department of Teaching and Learning welcome you to the graduate program and offer their assistance throughout your program.

Darcy Miller, PhD
Chair, Department of Teaching and Learning

The Program Coordinator

Dr. David Slavit

Congratulations, and welcome to the Mathematics and Science Education Ph.D. program. We are pleased that you have joined our community of learners and hope you will find your experience with us exciting, challenging, and rewarding. Your overall experience in the program will be supported by many experienced professionals, whom you will work with in collaborative scholarship. However, the rewards and benefits you receive are largely up to you. You have the opportunity to construct a program that meets your individual interests and needs, and the more you put into your experience with us, the more you will learn, grow, and succeed. Best of luck!

David Slavit, PhD
Boeing Distinguished Professor of Mathematics Education and Mathematics
Coordinator, Mathematics and Science Education PhD

Introduction

The guidelines in this handbook are to assist you in planning and completing your program. Please read and discuss them with your advisor. If you have questions that are not addressed in this handbook, please contact your advisor or the staff in the Office of Graduate Education in the College of Education. You can also visit our website <http://education.wsu.edu/graduate/> for additional information.

The forms discussed in this handbook are available from the College of Education Office of Graduate Education and the Graduate School website: <http://gradschool.wsu.edu/current-students/formsfordegree.html>.

New Student Information

Residency Requirements

<http://admission.wsu.edu/requirements/residency.html>

Maps

Pullman campus: <http://map.wsu.edu/>

Spokane campus: <http://spokane.wsu.edu/aboutWSUSpokane/Visiting/campusMap.html>

Tri-Cities campus: <http://tricities.wsu.edu/campusmaps>

Vancouver campus: <http://www.vancouver.wsu.edu/community/campus-map-directions-and-parking-information>

I-9 Forms

WSU employs only U.S. citizens and aliens who are authorized to work in the U.S. in compliance with the Immigration Reform and Control Act of 1986.

<http://www.wsu.edu/forms2/ALTPDF/BPPM/60-04.pdf>

W-4 Forms

U.S. Citizens: <http://www.wsu.edu/payroll/taxes/completeW4.htm>

Non U.S. Citizens: <http://www.wsu.edu/payroll/nonUS/newInstIRSFormW4.htm>

Tax Information

U.S. Citizens: <http://www.wsu.edu/payroll/taxes/taxes.htm>

Non U.S. Citizens: <http://ip.wsu.edu/global-services/tax-info.html>

Automatic Payroll Deposit

<http://www.wsu.edu/payroll/fspay/directdep/directdep.htm>

Social Security Numbers

Significance and correction of an SSN: <http://www.wsu.edu/forms2/ALTPDF/BPPM/55-05.pdf>

Use of an SSN on forms:

http://public.wsu.edu/~forms/HTML/BPPM/90_Records/90.78_Use_of_Social_Security_Number_on_Forms.htm

Application pointers: <http://www.wsu.edu/payroll/stntpay/sscardappoint.htm>

General Information

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Central Services and Facilities

Student Services, including Health and Counseling Services

Pullman: <http://osae.wsu.edu/>

Spokane: <http://spokane.wsu.edu/students/current/studentaffairs/>

Tri-Cities: <http://www.tricity.wsu.edu/student-affairs/index.html>

Vancouver: <http://studentaffairs.vancouver.wsu.edu/>

Libraries

Pullman: <http://www.wsulibs.wsu.edu/>

Spokane: <http://spokane.wsu.edu/academics/library/>

Tri-Cities: <http://www.tricity.wsu.edu/Library/index.html>

Vancouver: <http://library.vancouver.wsu.edu/>

Parking

Pullman: www.parking.wsu.edu

Spokane: <http://spokane.wsu.edu/aboutWSUSpokane/Visiting/Parking/>

Tri-Cities: <http://www.tricity.wsu.edu/parking/>

Vancouver: <http://admin.vancouver.wsu.edu/parking/parking-services>

Program Administration

Program Bylaws

The Mathematics & Science Education Ph.D. Program Bylaws (see Appendix E).

Program Coordinator

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Academic Requirements, Policies, and Procedures

Department of Teaching and Learning Ph.D. Programs

The Ph.D. requires at least 72 credit hours of study and consists of graded and non-graded coursework. The Ph.D. program must include a minimum of 34 semester hours of graded credit beyond the bachelor's degree and a minimum of 20 semester hours of Doctoral Research, Dissertation, and/or Examination (T&L 800).

Mandatory Research Training

All graduate students are required to complete the Responsible Conduct of Research online training module. This is a web-based training located at <https://myresearch.wsu.edu/MandatoryTraining.aspx>. Students are encouraged to take this training as soon as they are admitted to the doctoral program. Once you have completed this training, you will receive email confirmation of your completion. Please forward this email to the College of Education Office of Graduate Education (gradstudies@wsu.edu). Delay in the completion of this training could delay a student's progression through their graduate program. The training will need to be repeated after a five-year period.

Advisor

Assignment of a Temporary Advisor

Your admission letter from the Department indicates the faculty member who will serve as your temporary advisor. The temporary advisor will assist you with the initial selection of course work and other program requirements. You should contact your advisor prior to enrolling in classes. The temporary advisor serves until you select a permanent advisor who will chair your doctoral committee. While you may decide to ask your temporary advisor to chair your doctoral committee, you are also free to ask another faculty member in your program.

Selection of a Permanent Advisor/Committee Chair and Doctoral Committee

You are encouraged to select a permanent advisor/committee chair as soon as possible after your first semester of study, or if you are a part-time student, after completing 20 credits or by your fifth semester, whichever comes first. By this time, you should know several faculty members and their areas of specialization. The permanent advisor/doctoral committee chair must have a doctoral degree and be qualified, according to College of Education guidelines, to chair doctoral committees. The individual must be a member of the Graduate Faculty in the Mathematics and Science Education Ph.D. Program (see Faculty List at the end of the Program Bylaws in Appendix C). The individual should also have expertise in the area that will be the focus of your study. This will be reflected in the faculty member's record of research and publication, teaching, and professional service. If you need additional assistance in selecting a permanent advisor/committee chair, consult with the department chair, a faculty member you know, or the staff in the College of Education Office of Graduate Education.

Your permanent advisor/committee chair will help you develop and file your Program for Doctoral Degree and identify other faculty members to serve on your doctoral committee. The doctoral committee must consist of at least two members, in addition to the committee chair, who hold a doctoral degree and are qualified, according to College of Education guidelines and Mathematics and Science Education Ph.D. program bylaws, to serve on doctoral committees. At least two of the three committee members must be members of the Mathematics and Science Education Ph.D. Program Graduate Faculty and the Department of Teaching and Learning. All three committee members should have expertise related to

your program of study. One person who does not meet the College of Education criteria for serving on doctoral committees may be appointed to the committee as a fourth member. The committee must also include a faculty member from your chosen cognate area. The supporting cognate area may be from the College of Education or another college.

When selecting committee members, take into account whether each committee member

- has a Ph.D. or Ed.D.
- has previous experience on dissertation committees
- meets College of Education criteria for serving on doctoral committees
- is available for the duration of the dissertation (e.g., are there sabbatical or retirement plans?)
- has expertise related to the topic of research
- has expertise in the research methodology
- is accessible for meetings with you and other committee members
- provides prompt and constructive feedback
- is compatible with other committee members
- has the time to devote to your committee

Program of Study and Committee

The Program of Study (Appendix D) lists your committee chair and other committee members and the courses that comprise your doctoral program. Your permanent advisor/committee chair, in collaboration with other members of your doctoral committee, will help you identify the appropriate course work for your program of study. When committee members sign the form, it indicates they agree to be on your committee and approve your program of study.

The core courses for the Mathematics and Science Education Ph.D. must include a minimum of 43 semester hours of graded course work beyond the master's degree. (Requirements are shown in the Advising Sheet, Appendix A.) These graded courses are listed in the "Core Program" section of the Program of Study form. Details on these courses are provided in later sections. Generally, only graduate-level WSU and transfer courses can be included in the Program of Study. No course used for a previously completed masters or doctoral degree may be used. However, your doctoral program committee may approve up to 12 credits of non-graduate credit (300- or 400-level courses at WSU) for your program of study. Any course included in the Program of Study form in which a grade of "C-" or below is earned must be repeated as a graded course (it cannot be repeated on a S/F basis).

In the "Research and Additional Studies" section of the Program of Study form, list the Special Projects (T&L 600, SpEd 600) and Doctoral Research, Dissertation, and/or Examination (T&L 800) credits you plan to take, as well as courses taken on a S/F basis. You must enroll in T&L 800 in the semesters in which you take your comprehensive assessment examination and work on your dissertation. Your program must include at least 20 credits of T&L 800.

The Program of Study must be typed and circulated to the faculty members you asked to serve on your doctoral committee for their signature. You then submit the signed form to staff in the College of Education Office of Graduate Education, who then submit it to the chair of the major degree-granting unit, the chair of the minor department/program, if applicable, and to the Graduate School. Once approved by the Graduate School, an email will be sent to you and the College of Education Office of Graduate Education. The approved program becomes a part of the requirements for the degree.

Although Graduate School policy requires that this form be completed no later than the third semester of graduate work, or if you are a part-time student, no later than your sixth semester, or completion of 24 credits, whichever comes first, you are encouraged to submit it shortly after your first semester of course work, if you are a full-time student, or, if you are a part-time student, during your fifth semester or after completion of 20 credits. You are held to the doctoral program requirements in effect at the date of your admission, provided you submit a program of study and have it approved by the Graduate School within one year of your admission date. Otherwise, you will be held to the program requirements in effect at the time of approval of your Program of Study.

You may change the course work listed on an approved Program of Study by submitting a completed Change of Program form to the College of Education Office of Graduate Education (see Appendix D). Changes must be approved by your committee chair, the chair of the major department, and if applicable, the chair of the minor department. After approval at the departmental level, the form is forwarded to the Graduate School.

To request a change in committee membership, submit a completed and signed Committee Change form (link to form in Appendix D) to the College of Education Office of Graduate Education. The new committee members must sign the form. Additionally, anyone dropped from a committee must initial the form. The form is then forwarded to the chairs of the major and, if applicable, minor departments for approval. If approved at the department level, the form is forwarded to the Graduate School for approval.

Annual Review

Each year the Graduate School requires progress reviews of all graduate students. Your advisor completes the annual progress review form (Appendix B), noting whether or not you are making satisfactory progress toward completion of your program, and sends it to you for review and your signature. You receive a copy of the signed form. The advisor may recommend that you schedule a meeting with her/him to discuss your progress.

Continuous Enrollment Policy

All full- and part-time degree-seeking graduate students at all campus locations must maintain continuous enrollment in the Graduate School, registering for each semester, excluding summer sessions, from the time of first enrollment until all requirements for the degree are completed. Continuous enrollment is maintained by registering for a minimum of 2 graduate credits per semester (excluding the summer). For further information regarding the Continuous Enrollment policy go to the Graduate School Policy and Procedures at <http://gradschool.wsu.edu/chapter-five-a2/>. If a student needs to request leave, a form (See Appendix C) must be submitted to the Graduate School.

Graduation Checklist

Application for Doctoral Degree, Deadlines and Procedures Summary, and Information for Committee Members and Students Planning Final Examinations

The semester prior to when you plan to graduate, you should file an Application for Degree form with the Graduate School (Appendix C). The fee associated with the Application for Degree must be paid prior to the final examination. If you do not graduate in the semester for which you applied, you must reapply for the degree. However, the fee is paid only once and carries over from semester to semester until you graduate.

The semester prior to scheduling the final examination, you should review the Graduate School Deadlines and Procedures Summary (available on the Graduate School website). Reviewing the Summary at that time will allow you time to complete any deficiencies.

You should also obtain a copy or visit the Graduate School website to review the Digital Dissertation and Thesis Guidelines. This document includes important information about the format of the dissertation title page, signature page, and abstract; copyright releases; and submission of digital dissertations.

Thesis/Dissertation Submission and Binding

After you pass the final oral examination, you have five working days to submit a digital copy of the dissertation to the Graduate School (for requirements, see forms in Appendix C). This must occur prior to the scheduled end of the semester. For information about the format of the dissertation, please refer to the Digital Dissertation and Thesis Guidelines that can be found on the Graduate School website. As of Fall 2008, all dissertations must be submitted digitally to the Graduate School.

Additionally, you must submit two copies of the original signature page (in black ink), title page and abstract page to the Graduate School. One of these copies must be on 100% cotton paper. You must also submit a Copyright Acknowledgement/Final Dissertation Acceptance Checklist (includes Hold Harmless/Copyright Acknowledgement form), a Dissertation Agreement form, and a completed and signed Survey of Earned Doctorates. Each dissertation is placed on microfilm, so you must pay a microfilming fee. If you wish to copyright your dissertation, there is a copyright fee.

All students are required to submit one bound copy (does not have to be on 100% cotton paper) of the dissertation to the department, and a second copy to the committee chair (binding is optional and up to the chair). Any additional copies submitted to the other committee members are up to the individual faculty/student.

Students have ten working days after their final defense to submit the bound copies of their dissertation to the department and their committee chair. The departmental copy must be submitted to the COE Office of Graduate Education by this time. Upon submission of the dissertation, students must complete an exit survey provided by the Office of Graduate Education.

For more information:

<https://gradschool.wsu.edu/wp-content/uploads/sites/19/2014/07/DissertationThesesSubGdlnes.pdf>

Awarding of the Degree

Once you have completed the Application for Doctoral Degree and all requirements for the doctorate, you will receive the diploma and be hooded by your committee chair or designee at the next commencement.

Milestones for Successful Completion of Graduate Degree

The following table, adapted from the Graduate School website, provides an overview of the process for completing the doctoral degree. Because the Graduate School updates the table each year to include specific deadline dates, the days and years in the following table have been replaced by letters. The table is followed by a detailed description of some of the procedures listed in the table that follows.

Procedure	Under the Direction of	Date														
Obtaining an Advisor	Check with chair of major department/program	As soon as possible after admission to Graduate School														
Submission/Approval of program of study	<p>Doctoral students must submit the Program of Study <i>before the end of their third semester of study</i> (October 1st deadline for fall; March 1st deadline for spring).</p> <p>Preparation of the Program of Study is the responsibility of the student, the advisor, and the doctoral committee.</p> <p>Department approves before submitting to Graduate School</p>	<p>If your 3rd</p> <table> <tr> <td>Semester is:</td> <td>Deadline</td> </tr> <tr> <td>Summer 2014</td> <td>03-01-2014</td> </tr> <tr> <td>Fall 2014</td> <td>10-01-2014</td> </tr> <tr> <td>Spring 2015</td> <td>03-01-2015</td> </tr> <tr> <td>Summer 2015</td> <td>03-01-2015</td> </tr> <tr> <td>Fall 2015</td> <td>10-01-2015</td> </tr> </table>	Semester is:	Deadline	Summer 2014	03-01-2014	Fall 2014	10-01-2014	Spring 2015	03-01-2015	Summer 2015	03-01-2015	Fall 2015	10-01-2015		
Semester is:	Deadline															
Summer 2014	03-01-2014															
Fall 2014	10-01-2014															
Spring 2015	03-01-2015															
Summer 2015	03-01-2015															
Fall 2015	10-01-2015															
Scheduling of preliminary examination ^a	Chair of the major and minor departments and Associate Dean of the Graduate School	After approval of program of study and completion of a substantial portion of the program														
Preliminary examination	Graduate Faculty of major and minor departments and Representative of the Graduate Studies Committee	At least four months prior to final oral examination														
Application for degree ^b Payment of Graduation fee (\$50.00)	Associate Dean of the Graduate School	<p>Fall 2014 10-10-2014 (Begin applying: 6/16/2014) w. \$50 late fee: 10/11-10/31/2014 w. \$75 late fee: 11/01-11/26/2014</p> <p>Spring 201503/06/2015 (Begin applying: 10/13/2014) w. \$50 late fee: 03/07-03/31/2015 w. \$75 late fee: 04/01-04/25/2015</p> <p>Summer 201505/29/2015 (Begin applying:...1/1/2015) w. \$50 late fee: 05/30-06/30/2015 w. \$75 late fee: 07/01-07/31/2015</p>														
Scheduling of final examination and ballot meeting ^c	Associate Dean of the Graduate School	<table> <tr> <td>Graduation</td> <td>Scheduling Deadline</td> </tr> <tr> <td>Spring 2014</td> <td>04/11/2014</td> </tr> <tr> <td>Summer 2014</td> <td>07/18/2014</td> </tr> <tr> <td>Fall 2014</td> <td>1/12/2014</td> </tr> <tr> <td>Spring 2015</td> <td>4/10/2015</td> </tr> <tr> <td>Summer 2015</td> <td>7/17/2015</td> </tr> <tr> <td>Fall 2015</td> <td>1/10/2015</td> </tr> </table>	Graduation	Scheduling Deadline	Spring 2014	04/11/2014	Summer 2014	07/18/2014	Fall 2014	1/12/2014	Spring 2015	4/10/2015	Summer 2015	7/17/2015	Fall 2015	1/10/2015
Graduation	Scheduling Deadline															
Spring 2014	04/11/2014															
Summer 2014	07/18/2014															
Fall 2014	1/12/2014															
Spring 2015	4/10/2015															
Summer 2015	7/17/2015															
Fall 2015	1/10/2015															

Procedure	Under the Direction of	Date
Final Oral Examination	Doctoral Committee, Graduate	Graduation Exam Deadline

	Faculty, Representative of the Graduate Studies Committee, Chair of Major Department, Associate Dean of the Graduate School	Spring 2014 04/25/2014 Summer 2014 08/1/2014 Fall 2014 11/26/2014 Spring 2015 04/24/2015 Summer 2015 07/31/2015 Fall 2015 11/25/2015
Final Acceptance of archival manuscript and one copy of approved thesis ^d	Graduate School	If exam is held on final day listed above Final Docs Graduation Deadline Spring 2014 05/02/2014 Summer 2014 08/08/2014 Fall 2014 12/05/2014 Spring 2015 05/01/2015 Fall 2015 12/04/2015

NOTE:

- a** Submit completed scheduling form with approved examination date, hour and place to the Graduate School at least 10 working days prior to examination date.
- b** It is strongly advised that the application for degree be submitted at least one semester before the final oral examination is scheduled so that students can be notified of graduate requirements (to-do lists) before enrolling for their last semester. New degree application is required if final oral is not taken during current semester of application.
- c** Submit completed scheduling form (including approved examination date, hour and place) and a copy of the thesis to the Graduate School Office at least 10 working days prior to examination date. It is required that a copy of the dissertation be cleared by the Graduate School for compliance of format at the time of scheduling the final examination. A copy of the dissertation must be available for public inspection at least 5 working days prior to the final examination in the department office location designated by the department. The student must provide a copy of the dissertation to each member of the doctoral committee and to the Representative of the Graduate Studies Committee at least 10 working days before the committee members are asked to sign the scheduling form.
- d** It should be turned in within five working days of successful completion of final oral examination and before final date designated.
- e** May graduates who plan to attend commencement must have all degree requirements complete. Dissertations are due in the Graduate School by **May xx, 201x**.

Program Coursework and Requirements

General Overview

The Doctor of Philosophy in Education, with a specialization in Mathematics and Science Education is a research degree program that consists of a minimum of 72 credits. The program consists of a minimum of 43 graded credits and a minimum of 20 credits of T&L 800. The remaining credits may include graded and non-graded course work relevant to the doctoral program. In collaboration with the advisor/committee chair and other committee members, each student designs his/her doctoral program of study. The committee must approve the plan, which is formalized by submitting the [Program of Study](#) to the department chair and Graduate School.

Required Foundational Core Courses (16 credit minimum)

All Mathematics and Science Education Ph.D. students are required to take the following Foundational Core courses. Changes and/or substitutions must be approved by the program coordinator and department chair.

Course Number	Course Name	Credit
TCH_LRN 581	Learning and Development in Mathematics and Science	(3)
TCH_LRN 584	Research in Teaching Mathematics and Science	(3)
TCH_LRN 598	Research Seminar in Mathematics and Science Education	(4)
(1 credit/semester: 4 credits required but may be taken for up to 6 credits)		
<i>Two of the following courses</i>		
EdRes 565	Advanced Statistical Analyses and Quantitative Research	(3)
TCH_LRN 512	Language and Cultural Factors in Mathematics	(3)
TCH_LRN 561	Elementary School Mathematics Education	(3)
TCH_LRN 571	Elementary School Science	(3)
TCH_LRN 574	Science for All: A Multicultural Perspective	(3)
MATH 531	Intersection of Culture and Math (<i>Pullman only</i>)	(3)
MATH 532	Mathematics for College and Secondary Teachers	(3)

Research Core (15 credit minimum)

All doctoral programs require completion of the College's research core with some variation by program. In the Mathematics and Science Education Ph.D. Program, the following courses are required. Changes and/or substitutions must be approved by the program coordinator and department chair. Note that prerequisites to the following courses are not considered advanced research courses. **Where needed, the prerequisites must be taken in addition to the 15 credits of advanced research.**

Prerequisite for EdRes 562: EdPsy 505 or concurrent enrollment

Prerequisite for EdRes 563: EdRes 562

Prerequisite for EdRes 564: EdRes 563

Prerequisite for EdRes 565: EdPsy 508; EdRes 563

Course Number	Course Name	Credit
EdRes 562	Epistemology and Inquiry in Educational Research	(3)
EdRes 563	Principles of Doctoral Research	(3)
EdRes 564	Qualitative Methods	(3)
EdRes 565	Advanced Statistical Analyses and Quantitative Research	(3)
T&L 531	Frameworks for Research in Mathematics & Science Education	(3)

Required Cognate Area Courses and Additional Courses (12 credit minimum)

Students are required to take at least 4 additional courses in their chosen cognate area. These courses should be selected by the student in consultation with their committee chair. In addition to these required courses, other optional courses are shown on the Student Advising Sheet (Appendix A)

Grade Point Average

Doctoral students must have a 3.0 cumulative and a 3.0 program GPA in order to be awarded a graduate degree. No work of B- or below may be dropped from a program, nor can a course be repeated for a higher grade if the final grade is C or higher. Any course listed in the Program for Doctoral Degree with a grade of C- or below must be repeated, and it cannot be repeated on a S/F basis.

If you are a regularly admitted graduate student who has completed only one semester or one summer session of graduate study with a GPA of 2.75 or above, you are eligible for continued enrollment. Upon completion of two semesters, one semester and one summer session, or two summer sessions of graduate study and thereafter, a 3.0 GPA or above is required for continued enrollment in the Graduate School. If you are admitted on a provisional status, you must maintain at least a 3.0 GPA in order to continue your enrollment in the Graduate School.

If you fail to maintain a cumulative GPA of at least a 3.0 for two semesters, one semester and one summer session, or two summer sessions, your enrollment will be terminated. If your GPA is between 2.75 and 2.99, you may be reinstated by the Dean of the Graduate School upon favorable recommendation of the department chair. Upon reinstatement, you will have one semester to raise your cumulative GPA to at least a 3.0.

If you are a newly admitted student who fails to obtain a cumulative GPA of at least 2.75 at the end of one semester or one summer session of graduate study, your enrollment will be terminated. You may be reinstated by the Dean of the Graduate School upon favorable recommendation of the department chair.

Registration and Credit Load

Graduate students are responsible for completing appropriate enrollment procedures each semester. Full-time graduate students must register for a minimum of 10 credit hours to maintain full-time enrollment status in the fall and spring semesters. All full-time graduate students must register for at least one (1) 700 (masters), 702 (non-thesis masters) or 800 (doctoral) level research credit each semester to track faculty advisor effort. Part-time graduate students must register for a minimum of 2 credit hours and no more than 9 credit hours to maintain part-time enrollment status in the fall and spring semesters. For further information regarding the Registration and Credit Load policy go to the Graduate School Policy and Procedures at <http://gradschool.wsu.edu/chapter-five-a5/>.

Transfer Credit and Credit Restrictions

The number of transfer credits allowed for the Mathematics and Science Education Ph.D. program is 12. If approved, up to 12 credits appropriate to the program of study (with a grade of B or higher) earned in other accredited graduate schools after the award of the bachelor's degree may be transferred and applied toward your graduate degree program. Graduate credit earned (with a grade of "B" or higher) at Washington State University prior to formal admission to the Graduate School, other than credit earned while enrolled as a Class 5E or Special 8 student, may be included in the number of prior credits allowed. The total of such credits from the two categories (transfer and prior WSU credits) is subject to the usual time restrictions and approval by the department and the Graduate School. None of these credits may be applied toward another advanced degree.

Extension courses, special problems, research and thesis, workshops, and correspondence courses will not receive graduate transfer credit. For necessary interpretations, inquiries should be sent to the Dean of the Graduate School.

Transfer credit is requested formally by listing the courses on the Program of Study, but preliminary determination will be made earlier upon request to the Graduate School. Graduate credit from non-accredited institutions will not be accepted for transfer to graduate degree programs. Graduate credit earned within the State of Washington from an accredited institution whose main campus is outside the state will be considered for transfer to a graduate degree program only upon special petition to the Dean of the Graduate School.

Non-required but Highly-recommended Activities

- Submit a proposal to present research at a major conference
- Submit papers for publication in refereed journals
- Volunteer as a reviewer for a publication or conference
- Engage in scholarly and/or teaching activity through a lens of equity and diversity, or in settings that involve or take into account equity and diverse learners
- Collaborate with faculty on grant development, submission, and/or enactment
- Work closely with a faculty member on a research project
- Complete the IRB CITI course (required)
- Conduct presentations to peers in courses
- If possible, teach undergraduate courses in pedagogy and/or content

Endorsement Information

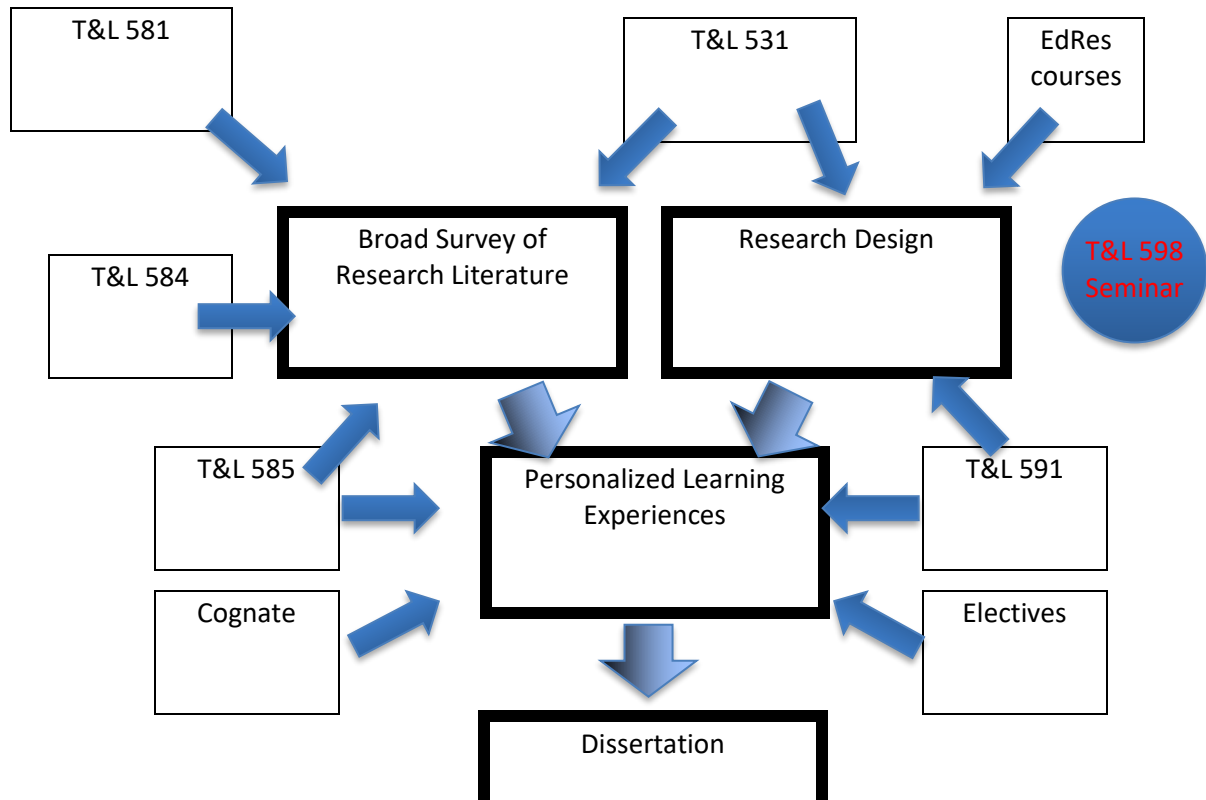
Students wishing to add an endorsement to their teacher certification must apply to WSU's add-on endorsement program. Once all coursework and testing requirements are met, students must submit a separate application to have the endorsement added to their certificate. More information and both applications can be found on the Student Services' website <http://education.wsu.edu/student-services/endorsements/>

Courses related to the middle level mathematics endorsement and the middle level science endorsement can become part of the Program of Study for your doctoral degree. Consult with your doctoral advisor and campus advising staff for more information.

Program Flow Chart

Mathematics and Science Education PhD Program Flow Chart

Broad overview	Learning Outcomes	Probable course
Survey of research on learning, teaching, and research paradigms in math/science education	Synthesize literature around a specific topic Theoretically frame a puzzle of practice Understand and compare various methodological approaches and study designs in math/science education	T&L 531 T&L 581 T&L 584 (T&L 591, 598)
Overview of general approaches to educational research	Understand and compare various educational methodological approaches and study designs	EdRes 562, 563, 564, 565 (T&L 591)
Survey of research on equity in the context of a specific aspect of math/science education	Understand and apply equity into problems of math/science education	T&L 512, T&L 574 (Math 531-Pullman only)
Readings and projects on student's specific area of interest	Expert fluency in a specific area of math/science education Focused research question Experience implementing research designs	Electives Cognate Research courses
Large-scale research project	Design and implement large-scale research	Dissertation



Comprehensive Written and Oral Assessment (also known as the Preliminary Examination)

Overview of Process

After the [Program of Study](#) has been approved and most or the entire program has been completed, the Comprehensive Assessment is designed and scheduled. The student must complete the [Preliminary Examination Scheduling Form](#) and submit it to the Graduate School at least 10 working days prior to the exam date. The products used for this assessment should illustrate the student's ability to *synthesize relevant research* in order to evidence her or his working knowledge of:

- important area(s) of science and/or mathematics education
- tensions that exist in a given field and the various stances towards them, and
- various research methodologies and implications of choosing one over another

Assumptions

The following three assumptions must be met:

1. The comprehensive assessment includes both written and oral components.
2. The committee chair and the student will identify the appropriate option for committee approval.
3. The comprehensive assessment must be passed before defending a dissertation proposal.

Options

There are three options to consider for the Comprehensive Assessment:

1. *Publishable paper and oral defense.* This option involves an original, single-authored research article that will be submitted for publication. A time line will be established for this option. The product must be empirical or theoretical in nature and submitted to an appropriate peer-reviewed journal for potential publication. Once the paper is received and reviewed by the committee (journal review is independent of this step), an oral defense will occur. The oral defense may involve aspects of the criteria related to your working knowledge (found above) that were not fully developed in the paper.
2. *Critical synthesis of research, theory, and practice, and oral defense.* This option will stem from three questions posed by the chair and committee members in consultation with the student. The student has three weeks total time to respond to all questions. Once all responses are received and reviewed, an oral defense will occur.
3. *Alternative comprehensive product.* This option allows the student to submit a written proposal to his or her chair and committee that describes an alternative comprehensive assessment product.

Oral Component and Balloting

Once all committee members have had the opportunity to read the written component of the assessment, the oral component of the assessment is scheduled. All committee members must be present. Following the oral examination, committee members meet to discuss the results and ballot on whether you pass or fail the assessment. The ballot meeting, which is scheduled in coordination with the Graduate School, may occur immediately following the oral exam or up to four weeks after the examination. All members of your committee must attend the oral exam and the ballot meeting and all must vote. The final ballot result is either a pass or fail. After the ballot meeting, the Office of Graduate Education will notify you in

writing regarding the results. You are also free to contact your chair after the ballot meeting to receive and discuss the results.

Repeating the Comprehensive Assessment

In the event of a failed assessment, you may be re-assessed a second and final time only at the request of the department/program that previously voted to fail you. There is no automatic right to a second assessment. At least three months must elapse between a failed assessment and a re-examination. Failure of two comprehensive assessments results in termination of enrollment in the doctoral program and the Graduate School.

Thesis/Dissertation Guidelines

The following section describes the dissertation proposal, how to complete a dissertation proposal, and the various steps involved in completing the dissertation. Please read the descriptions and guidelines carefully.

While you may begin work on the D1 prior to the comprehensive assessment (i.e., preliminary exam), you may not formally present your proposal until you successfully complete the examination.

Dissertation Proposal (D1)

A dissertation proposal (D1) is a concise and convincing overview of the research you propose to undertake for the dissertation. While the format for a D1 is variable, your committee chair and committee members may have specific requirements regarding the format. Discuss the format options with your chair, as well as the members of your committee. You may enroll in research credits (T&L 800) during the semesters in which you develop the proposal.

Typically, a semester or two prior to your comprehensive assessment you should begin working with your committee to define your area of research, identify specific research questions, and prepare the D1. The format should adhere to the style set forth in the latest edition of the Publication Manual of the American Psychological Association (APA). The D1 should address the following questions:

1. What is the rationale for the study? Why is it important?
2. What is the problem, issue, question, or hypothesis?
3. What have others speculated, asserted, found, and/or concluded about this problem, issue, question, or hypothesis?
4. What do you propose to do to investigate, explore, or examine your topics?
 - a. Whom will you observe, test, teach, interview, etc. (i.e., who will be the participants/subjects)?
 - b. What instruments or measures will be employed to conduct those activities?
 - c. How will you conduct the study (procedures)?
 - d. How will you organize or analyze the resulting data (analysis)?
 - e. What will be your intervention (if applicable)?
5. What knowledge will be added to the literature that was not known before? How is your study proposal going to significantly impact the field?

Development of a Dissertation Proposal (D1)

Students are expected to work closely with their dissertation chair and committee in constructing the D1. Written drafts of the D1 should be submitted to your committee chair, who will provide feedback. Your chair's feedback should be used to revise and clarify the D1. When you and your committee chair are satisfied with the D1, provide a copy to your committee for feedback. You and your chair will decide upon the means of obtaining your committee's feedback (e.g., a meeting, presentation, written comments submitted to you or the chair).

Provide adequate time (minimum of two weeks) for committee members to review drafts of your proposal. The writing process varies from one committee to the next. However, a typical process is for you to work closely with the committee chair to prepare and revise initial drafts of the D1 chapters. You and the committee chair will decide when it is best to begin sharing the chapters with the other committee members. Expect further revisions once the other committee members review the chapters.

When you and your committee determine you are ready for the formal presentation of the proposal, you must complete and submit a [Dissertation Proposal \(D-1\) Scheduling form](#) which can be obtained in the College of Education Office of Graduate Education. This includes reserving a room for your defense, which can be done in the College's Dean's office. You must secure the signatures of your committee and submit the D1 Scheduling Form to the Office of Graduate Education who will then secure the signature of the department chair and place the form in your file.

The formal dissertation proposal consists of a presentation in a colloquium that is open to the public. The presentation includes the opportunity for questions from your committee members and others in the audience. Immediately following the colloquium, your doctoral committee will meet to recommend approval or disapproval of the D1. The committee will indicate one of the following decisions on the Dissertation Proposal Approval Form (D-1): (a) approve as presented; (b) approve, subject to revisions as specified by the committee; (c) approve, subject to revisions as specified and subject to further review and approval by the committee; and (d) approval denied. Approval or disapproval of the dissertation proposal is documented by committee members' signatures on the D-1 form.

After approval of the D-1 and prior to any data collection, you must obtain WSU Institutional Review Board (IRB) approval to conduct research involving human subjects. The IRB letter of approval must be submitted to your committee chair and the College of Education Office of Graduate Education *before* you commence data collection. Failure to gain approval prior to data collection shall result in rejection of the final dissertation and prevent you from scheduling the final doctoral examination. Furthermore, disciplinary action may be taken by WSU and/or the Federal Office of Human Research Protection. The IRB form for approval of human subjects research is available on the Office and Grants and Research Development (OGRD) website: <http://www.ogrd.wsu.edu/forms.asp>

The dissertation proposal must be written according to the style specified in the latest edition of the Publication Manual of the APA. While you will develop the format for the proposal with your chair, the proposal typically addresses in greater detail most or all of questions addressed in the précis and consists of the following chapters:

Chapter I. Introduction (or Statement of Problem). This chapter provides a clear and concise view of what is to be studied and why. The phenomenon under study should be described, along with a brief analysis of the manner in which this phenomenon has been addressed in the extant literature. When appropriate, relevant contexts and autobiographical information may be provided to situate the study. Note that this chapter does not provide a complete literature review. In addition to the research question/hypotheses and analysis of how the phenomenon has been addressed in the literature, you should provide an overview of your research methodology and the implications of your proposed research. It is recommended that research questions are clearly stated somewhere in this chapter.

Chapter II. Review of the Literature. The structure of the literature review chapter will vary according to your topic and the approach you take to justify, based on the extant literature, your research questions. The review is a well-integrated document in which material is organized logically under headings and subheadings, consistent with the APA Publication Manual format. The review is selective. It does not include material unrelated to the research questions. Summary tables of relevant research are often appropriate. A good review identifies the theories, frameworks, primary research findings, adequately and inadequately documented conclusions, needed research, and implications of findings for theory and practice. Views and findings are more often restated, paraphrased, and summarized rather than quoted.

Chapter III. Methodology. The material in this chapter will vary depending on the nature of your proposed study. In general, the chapter should provide detailed information about the participants (who), procedures (how, when, where), data (what), and analysis. Topics may include:

1. Operational definitions.
2. Characteristics of participant(s). Provide a complete description of the participants, including the number of participants, how they will be selected, and the participant characteristics that are important to the study (e.g., age, gender, experience, education level).
3. Research design. If it's an ethnographic study, for example, describe your approach (e.g., participant-observer) and elaborate on what that will mean. For a quantitative study, describe the type of research (e.g., quasi- experimental), experimental and control groups, dependent and independent variables, and research design (e.g., post-test comparison of randomly selected control and experimental groups).
4. Instrumentation. Include a detailed description of any data collection instruments and/or procedures, including, if relevant, information about their validity and reliability. If you develop a new instrument, provide details about how you will develop the instrument, including, if relevant, how you will assure the instrument is valid and reliable. Instruments that are not commonly known should be appended to your proposal.
5. Apparatus. Thoroughly describe any equipment to be used in the conduct of the study.
6. Materials. Give a complete description or provide examples of any materials to be used in the study (e.g., written scenarios to which participants will respond).
7. Procedures. Provide a step-by-step description of how you will conduct the study. This should incorporate and tie together the other elements of the methodology (i.e., participants, research design, instrumentation, etc.).
8. Analysis. Describe in detail how you will analyze the data. It's insufficient to simply state an analytic method (e.g., constant comparative method, ANOVA). Instead, indicate which data, including subsets of data, will be subjected to which analytic methods and how the results relate to specific research questions.

Human Subjects Form

After approval of the D-1 and prior to any data collection, you must obtain WSU Institutional Review Board (IRB) approval to conduct research involving human subjects. The IRB letter of approval must be submitted to your committee chair and the College of Education Office of Graduate Education before you commence data collection. You must also attach a copy of the approval letter to your Dissertation/Thesis Acceptance/Final Examination scheduling form. Failure to gain approval prior to data collection shall result in rejection of the final dissertation and prevent you from scheduling the final doctoral examination.

The IRB form for approval of human subjects research is available at the Office and Grants and Research Development (OGRD) website (<http://www.ogrd.wsu.edu/Forms.asp>) or you can obtain the form at the OGRD office on the fourth floor of Neill Hall. The IRB form must be signed by the chair of your committee and the department chair before it is sent to OGRD. Review of the request generally takes 5-10 days, at which time OGRD will inform you by letter as to whether your research is approved.

Writing the Dissertation

The dissertation "...is a scholarly, original study that represents a significant contribution to the knowledge of the chosen discipline" (WSU Graduate School Policies and Procedures). You must enroll for research credits (T&L 800) in the semesters you work on the dissertation.

Upon approval of the D-1 and receipt of the IRB approval for human subjects research, you may begin the study as outlined in the methods section of your proposal. Upon completion of data collection and analysis, you are ready to write the dissertation.

Option 1: Standard Form

In its final form, the dissertation usually includes five chapters—the three described in the previous section plus the results and discussion chapters. It is not uncommon for them to undergo several iterations before final approval.

Chapter IV. Results. This chapter provides a detailed presentation of the results. Do not interpret the results, draw conclusions, or relate the findings to the extant literature. Examples of results include descriptive and/or inferential statistics, and themes, with supporting data, that emerged from analysis of qualitative data. The chapter is often organized around the analyses conducted for each research question.

Chapter V. Discussion. This chapter focuses on the meaning of the study and the significance of the results. The chapter typically begins with a brief summary of what was done and why. This is followed by a presentation of the results as they relate to the research questions. The discussion tends to be more conceptual than empirical and specific results are noted only as evidence to justify the assertions and conclusions related to the research questions. The discussion explains what the results may mean. This discussion may focus on why more support was not found to support or refute the research questions, or on the meaning of the support that was found. This discussion is a thoughtful analysis of the results obtained. It's appropriate to acknowledge the limitations of the research, state the implications of the findings for both theory and practice, and make recommendations for future research.

Option 2: Two Publishable Papers

Students who undertake this option are required to prepare two publishable papers. The papers are expected to be “publication ready” and eventually submitted to appropriate outlets. The student may collaborate with committee members and others in the writing process, but should be the sole or first author of both papers. The committee will formulate specific recommendations regarding appropriate outlets for the papers. These could include research journals, practitioner journals, book chapters, or other such scholarly outlets. On balance, the papers should represent scholarly work in line with the expectations outlined in a traditional dissertation.

Alternative Formats

Alternative formats to the dissertation formats described above must be approved by the Department and the Graduate School. Once your committee has approved the alternative format proposal, your committee chair requests approval from the Department's Graduate Committee. They, in turn, seek approval from the Graduate School.

Final Examinations

Scheduling the Final Examination

Your committee will review the entire dissertation. Revisions may be and often are required before the committee is satisfied that you are ready for the final oral defense. With the committee's consent that the written document is ready, schedule the final oral examination by providing your committee a completed [Dissertation/Thesis Acceptance/Final Examination Scheduling Form](#). Please be aware that you will need to have a completed draft of the entire dissertation at least 30 days prior to your final defense date. For Fall semester this means you will need to have a completed draft by at least mid-October and for Spring semester, you will need to have a completed draft by mid-March. Committee members' signatures signify preliminary approval of a typed or electronic form of the dissertation that is suitable in content and format for submission to the WSU Graduate School. Their signatures also indicate their acceptance of the date, time, and place of the final examination. Committee members must be given the entire dissertation a minimum of ten (10) days prior to any deadline for scheduling the defense.

The signed form is submitted to the College of Education Office of Graduate Education. This office will then circulate the materials to the department chair for signature. You must then submit the scheduling form along with a typed copy of the dissertation and a copy of the IRB approval form, to the Graduate School for approval. This copy of the dissertation will be returned to you. Although the Graduate School checks the dissertation, this check does not constitute final acceptance.

The [Dissertation/Thesis Acceptance/Final Examination Scheduling Form](#) and dissertation must be submitted to the Graduate School at least 10 working days in advance of the examination date. The examination must be scheduled at least four months, but less than three years, after satisfactory completion of the comprehensive assessment. The Graduate School will schedule the final examination and publicly announce the examination in an appropriate campus-wide publication. Final examinations shall be scheduled during regular working hours and only during academic sessions.

At least five working days prior to the final examination, a copy of the dissertation must be made available for public review in the Office of Graduate Education. At the same time, an abstract must be submitted electronically to the Office of Graduate Education.

Final Examination

The final oral examination is primarily a defense of the dissertation, but may also cover the general fields of knowledge pertinent to the degree. You must register for T&L 800 (minimum of two credits) in the semester in which you take the final examination. The examining committee shall include your doctoral committee and any other members of the faculty in attendance who are eligible, according to College of Education criteria, to participate on dissertation committees. Your committee chair will be responsible for conducting the final examination. While the examination is open to the public, only those faculty members eligible to participate on doctoral committees may ask questions and vote. All members of your doctoral committee must attend and vote. In order to pass the final oral examination, a minimum of three-fourths of those voting must vote to pass you. In the event of a failed final examination, a second and last attempt may be scheduled, at the request of the major department, after a lapse of at least three months. There is no automatic right to a second defense.

Graduate Student Exit Survey

After you complete the final examination/dissertation defense, complete the Graduate Student Exit Survey either online or paper copy (Appendix D) and return to the College of Education Graduate Studies Office, Cleveland Hall 252 (or submit to an Academic Director on the regional campuses).

Graduate Assistantships and Financial Aid

Teaching and Research Assistantship Appointments, Scholarships and Financial Aid

Funding for graduate students varies across the campuses. The Department of Teaching and Learning has approximately 10 teaching assistant (TA) positions on the Pullman campus. These positions are competitive and are awarded primarily to graduate students with previous teaching experience in the United States. The department attempts to support graduate students for more than one year, so a limited number of TA appointments become available each year. TA appointments are half-time positions that come with a tuition waiver, monthly stipend, and health benefits. The department discourages additional employment while holding a TA appointment.

Availability of assistantships on other campuses are available periodically; students should inquire with faculty and academic advisors on those campuses for information on possible opportunities.

TA appointments require full-time enrollment (i.e., minimum of 10 semester hours during the spring and fall terms). A TA typically teaches two courses each semester under the supervision of a faculty member. A TA must enroll in T&L 527 for one-credit in each semester of the TA appointment, up to a total of three credits (i.e., three semesters). The course covers teaching and learning, inquiry, and professional issues.

Research assistantships (RA) may be available through funded projects on all four WSU campuses. RA appointments require full-time enrollment. RAs typically work under the direction of a faculty member. RA appointments include a tuition waiver, monthly stipend, and health benefits. In addition, other assistantship opportunities are available in other units on campus. Whenever possible the department will provide assistance in identifying possibilities for funding outside of the college.

To be considered for a TA or RA position, complete a graduate assistant application, available from the department and the College of Education Office of Graduate Education <http://education.wsu.edu/employment/assistants/> or the Graduate School's website <http://gradschool.wsu.edu/current-students/formsfordegree.html>. At the time of appointment, you will receive a letter that delineates the specific responsibilities of the appointment.

College of Education Scholarships: Scholarships are available through the College of Education. Applications are available through University Scholarship Services in November and are due January 31st of the following year for the upcoming academic term. Awards generally begin at approximately \$2000. For more information, contact the College of Education Scholarship Coordinator (509-335-7843) or visit the website: <http://education.wsu.edu/scholarships/>.

Other Financial Aid: For additional financial aid information, contact the WSU Office of Student Financial Aid and Scholarship Services (509-335-9711) or visit the website: <http://www.finaid.wsu.edu>.

Leave Guidelines

During the term of their appointments, all graduate student service appointees are expected to be at work each normal workday, including periods when the University is not in session with the exception of the legal holidays designated by the Board of Regents. All University holidays are designated by the Board of Regents and are published in the WSU Week and posted on the Web at <http://www.hrs.wsu.edu/>. Graduate students on appointment do not earn annual leave or sick leave.

Non-resident graduate students holding either state funded or non-state funded graduate service appointments on a quarter-time or greater basis may be awarded a waiver of the non-resident differential. The department is responsible for awarding non-resident “NR” differential waivers in the waiver section of the PERMS action. Domestic graduate students who have residency outside of Washington State are highly encouraged to apply for Washington residency to avoid paying out-of-state tuition after their first year of their graduate appointment. Residency website;

<http://www.registrar.wsu.edu/registrar/apps/residency.aspx>

- a. Appointments for 50% or greater may receive a full non-resident “NR” waiver.
- b. Appointments less than 50% but at least 25% may receive half of a non-resident “1/2NR” waiver.
- c. Non-resident waivers cannot be guaranteed beyond one year. Contact the Graduate School for information regarding residency requirements and establishing residency.

For more information: <http://www.gradschool.wsu.edu/Documents/PDF/FY13GSApptProcMemo.pdf>

Travel

Students are strongly urged to attend professional meetings; however, the department does not have funds to pay travel expenses of students on appointment. Advisors may use grant or project monies to pay partial travel expenses for graduate students attending meetings. The Graduate School disburses some grant-in-aid travel funds, which can be used for travel to professional meetings. Application forms for student travel grants may be obtained from the Graduate School. It is advisable to apply for a travel grant if you are presenting a quality paper at a professional meeting. In addition, space may be available in University vehicles or some faculty members may share travel expenses.

Please see the note in the next section regarding obligations in regard to work-related travel.

Business Policies

Checkout/Exit:

Before departure from WSU-COE, students must leave a forwarding address with the COE Office of Graduate Education, return all keys and equipment to the main office, and consult with the advisor about the student's research and office space.

Grievances:

If grievances arise, the student should discuss the problem with their advisor/chair and the Graduate Coordinator(s). If additional consultation is needed, please consult the Department Chair or Unit Director, or as a final resort, the WSU Ombudsman. The WSU Ombudsman Office is in Wilson Hall, Room 2, phone (509) 335-1195, and is available to students on all campuses.

Dissertation Library:

The department maintains a dissertation library for graduates in Cleveland Hall 315.

Travel:

For liability purposes, all students seeking to obtain financial reimbursement for work-related travel must complete a Travel Authority form. Contact your campus academic advisor for access to this form. This form must be submitted, signed by the Department Chair, and initialed by your advisor/chair at least 21 days before a trip. In some circumstances, work-related travel advances may be obtained by submitting a request at least four weeks before the trip. If funds are available, reimbursement for travel expenses is made by completing and submitting a Travel Expense Voucher within one week upon return. Only approved travel will be reimbursed.

Appendix A

Student Advising Sheet

Student Name: _____ **WSU ID:** _____
Degree Program: _____ **E-mail:** _____

Course #	Course Name	Credits	Date	Grade
Required Foundational Core Courses (16 credit minimum)				
<i>Required courses:</i>				
TCH_LRN 581	Learning and Development in Mathematics and Science	3		
TCH_LRN 584	Research in Teaching Mathematics and Science	3		
TCH_LRN 598	Research Seminar in Mathematics and Science Education (1 credit/semester: 4 credits required but may be taken for up to 6 credits)	4		
<i>Two of the following courses:</i>				
TCH_LRN 512	Language and Cultural Factors in Mathematics	3		
TCH_LRN 561	Elementary School Mathematics	3		
TCH_LRN 571	Elementary School Science	3		
TCH_LRN 574	Science for All: A Multicultural Perspective	3		
MATH 531	Intersection of Culture and Math (<i>Pullman only</i>)	3		
MATH 532	Mathematics for College and Secondary Teachers	3		
Required Research Core (15 credits)				
ED_RES 562	Epistemology and Inquiry in Educational Research	3		
ED_RES 563	Principles of Doctoral Research	3		
ED_RES 564	Qualitative Methods	3		
ED_RES 565	Advanced Statistical Analyses and Quantitative Research	3		
TCH_LRN 531	Frameworks for Research in Mathematics and Science Education	3		
Supporting Cognate Area (12 credit minimum)				
Additional Optional Courses**				
TCH_LRN 585	Focused Reading and Conference in Math/Science Education	3		

	(May be taken multiple times for up to 9 credits)			
TCH_LRN 591	Research Internship in Math/Science Education (May be taken multiple times for up to 6 credits; in the future, may be available for variable credit [1-3 credits/semester])	3		
ED_RES 571	Dissertation Preparation	3		

TOTAL GRADED CREDIT (43 minimum) _____

Research, Dissertation, and/or Examination (20 credits minimum)				
TCH_LRN 800	Research, Dissertation, and/or Examination			

TOTAL CREDITS (72 minimum) _____

NOTES:

** Faculty strongly suggest taking these courses only after completing at least 2 semesters and 12 or more credits.

*** Graduate School Policy regarding undergraduate courses:
No more than 9 credits of non-graduate (300-400 level) credit graded course work may be used for the total credits for the Program of Study.

Student Signature: _____
Signature
date

Advisor Signature: _____
Signature
date

Addendum

Additional courses students or faculty suggest might be of interest:
 PHIL 540 Ethics in Research for the Social Sciences (3 credits)
 T&L 582 Academic Writing for Dissertations and Publications (3 credits)

Appendix B

Mathematics and Science Education Ph.D. Program Student Annual Review

According to policies established by the Graduate School and Mathematics and Science Education Ph.D. Program Faculty, faculty will review all graduate students annually in order to monitor their progress. All students will be informed in writing of the results of this review.

Student progress through the program will be considered using the following framework but this consideration will not be limited to this framework. Students should submit an updated vita and statement of progress each year documenting their yearly and cumulative progress, including any steps taken to address comments from past annual reviews.

Student:

Advisor:

Program entry year:

Credits completed by the end of the current semester:

Full-time or part-time program attendance (if part-time, indicate credits taken per semester this year)

Anticipated graduation date:

1. Program Status

Year in program:

Completed CITI Training? Yes No

Completed Responsible Conduct of Research Training? Yes No

Approved Program of Study submitted to Graduate School? Yes No

Scheduled or successful completion of Comprehensive/Preliminary Exam? Yes No

2. Overall Academic Performance

a. Most recent cumulative GPA in program_____

b. List any courses with grades below "B" _____

c. List any courses with incomplete ("I") grades: _____

3. Progress on Learning Goals

a. Student locates, analyzes, and synthesizes research literature, and applies that synthesis to problems of practice.

Not yet applicable

Emerging

Proficient

Satisfactory Progress_____

Comments:

b. Student effectively communicates scholarly work through written, oral, and/or alternate formats.

Not yet applicable Emerging Proficient

Satisfactory Progress_____

Comments:

c. Student skillfully inquires into areas of program-related interest.

Not yet applicable Emerging Proficient

Satisfactory Progress_____

Comments:

d. Student shows scholarly habits of curiosity, inquiry, skepticism, and data-based decision making.

Not yet applicable Emerging Proficient

Satisfactory Progress_____

Comments:

e. Student expresses value of diversity and demonstrates this value in pedagogical and inquiry endeavors.

Not yet applicable Emerging Proficient

Satisfactory Progress_____

Comments:

f. Program graduate conducts and disseminates original scholarship that demonstrates acquisition and application of new knowledge and theory.

Not yet applicable Emerging Proficient

Satisfactory Progress_____

Comments:

g. Program graduate shows potential as an emerging expert in her/his area of study.

Not yet applicable Emerging Proficient

Satisfactory Progress_____

Comments:

Appendix C

Required Forms for Program

Deadlines and Procedures – These are the deadlines and procedures for graduation set by the Graduate School and updated yearly. Found at <http://www.gradsch.wsu.edu/Forms/>

Program of Study – Your advisory committee assists you in the development of your proposed program of study. Found at <http://www.gradsch.wsu.edu/Forms/>

Preliminary Exam – Must have approved program of study on file, and permission from committee. Check deadlines. Found at <http://www.gradsch.wsu.edu/Forms/>

Proposal Defense (DI) – To schedule your dissertation or thesis proposal meeting, please have your committee sign the D-1/T-1 scheduling form. A D-1 form must be completed at a dissertation proposal meeting. Found at <http://education.wsu.edu/students/graduate/index.html>

Final Scheduling form – Must have approved form on file at the Graduate School before scheduling final defense or exam. Found at <http://www.gradsch.wsu.edu/Forms/>

Application for Degree – preferably be submitted at least one semester prior to graduation and must be filed before the final examination. You will need to apply online at the graduate school. Once submitted, the Graduate School then generates a “to do list” that will specify any deficiencies that you may have. Your application will not be processed if the Graduate School does not have an approved program of study on file. Found at <http://www.gradsch.wsu.edu/Forms/>

Guidelines for Theses and Dissertation Formatting and Submission – Instructions for finalizing and submitting your dissertation. Found at <http://www.gradsch.wsu.edu/Forms/>

Final Dissertation/Thesis Acceptance Checklist – A list of tasks to be completed in the semester in which you are planning to graduate. Found at <http://www.gradsch.wsu.edu/Forms/>

Graduation Checklist – A list of tasks to be completed in the semester in which you are planning to graduate. Found at <http://www.gradsch.wsu.edu/Forms/>

Survey of Earned Doctorates – Submit along with your final dissertation. Can also be done online. Found at <http://www.gradsch.wsu.edu/Forms/>

Additional Forms:

Committee Change – to add or remove a committee member. Found at <http://www.gradsch.wsu.edu/Forms/>

Change of Program – if a change is made to a program of study after the program has been approved by the Graduate School. Found at <http://www.gradsch.wsu.edu/Forms/>

Graduate Leave Form – For graduate students who wish to go on official graduate leave. Found at <http://www.gradsch.wsu.edu/Forms/>

Petition Form – Petition changes in enrollment and/or academic calendar deadlines. Found at <http://www.gradsch.wsu.edu/Forms/>

Re-enrollment – If you are unable to attend courses for a semester, you will be required to submit a re-enrollment form. This has a \$25 nonrefundable processing fee. Found at <http://www.gradsch.wsu.edu/Forms/>

Appendix D

College of Education Graduate Programs Exit Survey

NOTE: We are interested in feedback from your program experience. Your responses will be held in strict confidence, and you will not be identified in any reports or release of survey data. Survey results will be aggregated and reported as group data. For questions/concerns, contact Dr. Jason Sievers at 509-335-9195; jasievers@wsu.edu or a Department Chair.

Last 5 digits of your WSU ID#: _____

Your ID Number will not be associated with the results; nor will the departments know the identity of survey respondents.

Please circle your response to each question below:

What semester and year did you graduate or complete a certification/endorsement?

Spring Summer Fall 20__

What semester and year did you graduate or complete a certification/endorsement?

M.I.T Ed.M. M.A. Ed.D. Ph.D. Certification/ Endorsement

If you obtained a degree which program specialization did you complete?

Department of Educational Leadership and Counseling Psychology

Counseling Psychology	School Counseling	Community Counseling
Higher Education	Student Affairs	Community College Leadership
Educational Leadership	Educational Psychology	Sport Management

Department of Teaching and Learning

Language & Literacy Education (LLE)	English Language Learners (ELL)	
Focus: Language or Literacy	Focus: ESL/Bilingual Education or Literacy	
Cultural Studies and Social Thought	Curriculum and Instruction	Special Education
Teacher Leadership	Math Education Elementary Education	Secondary Education

Other: _____

Which certification/endorsement did you complete?

Superintendent Program Administrator School Counseling Teacher Principal

Add on Endorsement (e.g. Special Education):

How many years did it take you to complete your specialization or certification/endorsement?

< 1 2 3 4 5 6 7 8 9 10 >

Were you primarily: Part Time Student Full Time Student

On which campus did you complete your specialization or certification/endorsement?

Pullman Spokane TriCities Vancouver Online

	Not at All		Some what	Very Much		Not Applicable
1. How satisfied were you with the availability of faculty for	1	2	3	4	5	N/A
2. To what degree did the specialization meet your individual	1	2	3	4	5	N/A
3. To what degree have you been satisfied with the overall quality of courses/ instruction of courses?	1	2	3	4	5	N/A
4. To what degree were you satisfied with your ability to interact with other students and faculty in your program?	1	2	3	4	5	N/A
5. How satisfied were you with opportunities provided you to research/ disseminate research?	1	2	3	4	5	N/A
6. To what degree were you given opportunities to make connections between theory and practice?	1	2	3	4	5	N/A
7. How well prepared do you feel to enter a new career?	1	2	3	4	5	N/A
8. How satisfied were you with the support provided by the College of Education Office of Graduate Education (Pullman campus) or similar support received at the regional campus in which you are a student?	1	2	3	4	5	N/A

1. Please describe the most positive aspects of your time in one of our graduate programs.

2. Please describe the most important ways we can improve our programs for incoming graduate students.

3. What is your career goal?

Appendix E

Mathematics and Science Education Ph.D. Program Bylaws

Washington State University
Administrative Home: Department of Teaching and Learning
Last Revised – by Faculty September 15, 2014

Faculty Senate Approval Date: __Pending Final Approval_____

I. Objectives

Degree offered: Ph.D.

Discipline: Mathematics and Science Education is a general reference to the fields of teaching and learning in the subject areas of mathematics and science from pre-kindergarten to graduate school.

Mission of the Program: The Ph.D. in Mathematics and Science Education develops scholars capable of making important contributions to the research base, professional context, and learning environments related to mathematics and science education.

II. Membership

Graduate Faculty within the Mathematics and Science Education Ph.D. program may be WSU tenured and tenure track faculty, WSU non-tenure track faculty, or WSU adjunct faculty, subject to the limitations and definitions in this document. All Graduate Faculty must be “Initial Program Faculty” (listed in Section XI of this document) or subsequently approved as Graduate Faculty through the process outlined in section B below.

WSU Campus Participation

The doctoral degree in Mathematics and Science Education is offered through the Pullman campus of Washington State University. The faculty and campuses at Vancouver, Spokane, and Tri-Cities contribute to and support this program; they are integral to the functioning of the program.

Approved tenured and tenure track Mathematics and Science Education Graduate Faculty at all regional campuses may participate equally in the Mathematics and Science Education program as supporting site faculty with full program rights and responsibilities. As such they are entitled to act as chair, co-chair, or member of graduate student committees; teach graduate courses; supervise research; and act as a program director or committee member.

Graduate Faculty Participation

Graduate Faculty participation in the Mathematics and Science Education Ph.D. Program is independent and separate from academic department, school, or college affiliations.

All active members of the Graduate Faculty of the Mathematics and Science Education Ph.D. Program are eligible to vote on program issues.

Disciplinary Expertise

Graduate Faculty within the Mathematics and Science Education Ph.D. Program are expected to have a PhD or equivalent doctoral-level degree in a field related to mathematics and/or science education. In addition, they must have demonstrated disciplinary expertise in a field related to mathematics and/or

science education, interest and experience in mentoring and teaching of graduate students in this field, and relevant professional accomplishments.

Active Research Appropriate to the Mathematics and Science Education Ph.D. Program

Mathematics and Science Education Ph.D. Program Graduate Faculty must be actively involved in research and graduate level teaching related to mathematics and/or science education as evidenced by continuing scholarly or creative work and evidence of substantial involvement in graduate education, including recent external grant or contract support, related peer-reviewed publications within the last 5 years, graduate student mentoring within the last 5 years, teaching of relevant graduate level courses, or other relevant professional accomplishments. New faculty without previous involvement in graduate student advising can satisfy this requirement by having a named mentor whose role is to help the faculty member advise and direct graduate students.

Non-Tenure Track Graduate Faculty

Internal to WSU

Non-tenure track Graduate Faculty internal to WSU include research, clinical, and affiliate faculty. If these non-tenure track faculty internal to WSU have a history of active Mathematics and Science Education Ph.D. Program Graduate Faculty participation and hold a Ph.D. or equivalent doctoral degree, they may be entitled to teach graduate courses in the program and act as members of graduate student committees, including chair or co-chair. On a case-by-case basis, the tenure-track Mathematics and Science Education Ph.D. Program Faculty will consider whether a non-tenure track Graduate Faculty member internal to WSU, with a history of active participation in the Mathematics and Science Education Ph.D. is eligible to undertake any or all of the above duties. Approval is subject to review of a signed petition and review of the faculty's curriculum vita at a Mathematics and Science Education Ph.D. program meeting, and is subject to subsequent majority vote.

External to WSU

Professionals who are not WSU faculty may be granted Graduate Faculty participation within the Mathematics and Science Education Ph.D. Program if they hold a Ph.D. or equivalent doctoral degree and are first officially approved as adjunct faculty for WSU. Adjunct faculty who are approved as active Mathematics and Science Education Ph.D. Program Graduate Faculty are entitled to act as a member of graduate student committees; teach graduate courses; and supervise research. They may not serve as student committee chair or co-chair, or as a Mathematics and Science Education Ph.D. Program Committee member.

External Individual Committee Members

Individual Committee Member Internal to WSU: Individuals not officially participating as Graduate Faculty within the Mathematics and Science Education Ph.D. Program (for example, a faculty member from another WSU department or program) may serve on graduate committees as long as they hold a Ph.D. or equivalent doctoral degree and are a member of the Graduate Faculty in their own program or discipline and their committee appointment is approved by the Coordinator of the Mathematics and Science Education Ph.D. Program.

Individual Committee Member External to WSU: Individuals not officially participating as Graduate Faculty within any graduate program at WSU (for example, a faculty member from another university or research entity who holds a Ph.D. or equivalent doctoral degree) may be approved to serve as a dissertation committee member for an individual student on a case-by-case basis. The committee chair for that student should forward the name and a curriculum vita of the desired committee member to the Mathematics and Science Education Ph.D. Program Coordinator. With approval of the Program Coordinator, the nomination (with accompanying CV or other documentation of expertise) is forwarded

to the Chair of the Department of Teaching and Learning for approval, followed by forwarding to the Dean of the Graduate School for final approval.

B. Application for Membership

Initial Graduate Faculty within the Mathematics and Science Education Ph.D. Program are listed in Section XI of this document and have been approved by the Mathematics and Science Education Ph.D. Program existing faculty, Mathematics and Science Education Ph.D. Program Coordinator, the Chair of the Department of Teaching and Learning, and Dean of the Graduate School.

Candidates for Graduate Faculty participation within the Mathematics and Science Education Ph.D. Program should be nominated by an existing Mathematics and Science Education Ph.D. Program Graduate Faculty member or may self-nominate. The nomination should include a letter of nomination, and a curriculum vitae for the nominee. The Program Coordinator will circulate application materials to all active Graduate Faculty prior to voting. Acceptance as Graduate Faculty requires a positive vote from a majority of faculty who respond to the vote.

In addition to a commitment to maintain the highest standards of mentoring for graduate students, anticipated contributions or qualifications for all successful Graduate Faculty applicants include history of regular attendance or, in the case of new faculty, participation in Mathematics and Science Education Ph.D. Program faculty meetings plus one or more of the following:

History or reasonable expectation of an active, funded research program that can plausibly be relied upon as the source of continuing support of a Mathematics and Science Education Ph.D. Program graduate student.

History of or willingness to participate as appropriate in administrative, teaching, and other functions of the Mathematics and Science Education Ph.D. graduate program. This may include serving on graduate program administrative committees; serving as a dissertation committee member or chair; or providing graduate level instruction.

History of publication of peer-reviewed manuscripts in a discipline related to Mathematics and Science Education.

C. Continuation of Active Membership

Graduate Faculty appointments to the Mathematics and Science Education Ph.D. Program will be reviewed for continuation of active membership by the Program Coordinator every 3 years with one-third of the membership reviewed each year. They will be evaluated for contributions to graduate instruction, research, and teaching. Contributions to the Mathematics and Science Education Ph.D. Program shall be a requirement for continued active membership. Contribution may take the form of:

Committee chair, co-chair or member for graduate students in the Mathematics and Science Education Ph.D. Program

Teaching or co-teaching a graduate course in the Mathematics and Science Education Ph.D. Program
Supervising research for graduate students in the Mathematics and Science Education Ph.D. Program
Serving in the administrative and committee structure of the Mathematics and Science Education Ph.D. Program, including roles as Coordinator, Co-coordinator, or committee member

Faculty who do not make any of the contributions as stated in C.1 above to the Mathematics and Science Education Ph.D. Program for three consecutive years will be designated as inactive Graduate Faculty. Inactive Graduate Faculty do not have voting rights. Initiation of any of these activities described in C.1 above will result in eligibility for restoration of active Graduate Faculty designation, upon approval of the Mathematics and Science Education Ph.D. Program Graduate Faculty, as outlined in Section II.B.2.

Discontinuation of Membership

Upon request of an active or inactive Graduate Faculty member, that individual membership will be discontinued. They may reapply for Graduate Faculty participation at any time.

Membership Appeal Process

Faculty appeal of any membership decision in the Mathematics and Science Education Ph.D. Program must be made in writing to the Coordinator of the Mathematics and Science Education Ph.D. Program within 30 calendar days of the decision. The appeal is determined by a majority vote of all Mathematics and Science Education Ph.D. Program Graduate Faculty (see Section IX for definition of quorum). Final written appeal may be made to the Chair of the Department of Teaching and Learning and the Dean of the Graduate School within 30 calendar days of the Mathematics and Science Education Ph.D. Program Graduate Faculty vote.

III. Administration

Administration of the program and its activities is vested in the Coordinator with advice from members of the Mathematics and Science Education Ph.D. Program Committee.

IV. Program Coordinator

The Coordinator of the Mathematics and Science Education Ph.D. Program will be elected in the Spring semester prior to the academic year of service. Candidates for the Coordinator position can be nominated or self-nominated at a meeting during that time. Only active Mathematics and Science Education Ph.D. Program Graduate Faculty are eligible for the position and to vote. In the case of more than one candidate, the candidate receiving the highest vote total will be named Coordinator. Final approval of the Program Coordinator resides with the Chair of the Department of Teaching & Learning and the Dean of the College of Education.

The Coordinator shall serve a term of 1 year and is eligible for re-election if nominated to continue in this position in accordance within the terms of the initial appointment and with final approval of the Chair of the Department of Teaching & Learning and the Dean of the College of Education as described in IV.A above. The Coordinator will also serve as the Assistant Coordinator the year before taking the Coordinator position.

The duties of the Assistant Coordinator are to consult with the Coordinator on decisions for which the Coordinator would like a second opinion but for which the full committee does not need to be convened. The Assistant Coordinator may also run Program meetings if requested to do so by the Coordinator.

The Coordinator may be removed from office by a majority vote of all active Mathematics and Science Education Ph.D. Program Graduate Faculty and with the approval of the Chair of the Department of Teaching & Learning and the Dean of the College of Education as described in IV.A above.

Duties of the Coordinator

Provide overall academic leadership for the Mathematics and Science Education Ph.D. Program.

Consult the Assistant Coordinator as needed in regard to decisions about program, students, or faculty, especially in cases when the full program faculty cannot be included in decision-making.

Develop and implement policies for the Mathematics and Science Education Ph.D. Program when needed.

Represent the interests of the Mathematics and Science Education Ph.D. Program to the campus and University administrators.

Call and preside at meetings of the Graduate Faculty of the Mathematics and Science Education Ph.D. Program.

Be responsible for coordinating all the Mathematics and Science Education Ph.D. Program administrative matters within the Graduate School.

Submit course or curriculum change or approval forms and ensure that faculty are aware of the need, have discussed, and approve of the change.

Submit bylaws changes or approval forms.

Be responsible for the accuracy of all publications related to the Mathematics and Science Education Ph.D. Program including student handbooks, recruitment materials, web pages, and catalog copy.

Coordinate the Mathematics and Science Education Ph.D. Program graduate course teaching assignments and scheduling with relevant department chairs and campus academic directors.

Supervise the activities of the Mathematics and Science Education Ph.D. Program Academic Coordinators as they relate to the program.

V. Committees

Faculty Committee

Advises and assists the Coordinator in administering the Mathematics and Science Education Ph.D. Program, and assists with recruitment, admission, and curriculum. All active Mathematics and Science Education Ph.D. Program Graduate Faculty comprise the Faculty Committee.

Areas in which the Faculty Committee shall assist and advise the Coordinator include:

- Review, develop and update long-range goals for the Mathematics and Science Education Ph.D. Program and plans for their attainment. These ideas shall be reviewed annually.
- Serve as a sounding board for new ideas, changes, etc., in academic or administrative issues.
- Provide guidance on administration of the Program.
- Nominate members for service on other committees.
- Assist with the Mathematics and Science Education Ph.D. Program assessment process.
- Develop an annual recruitment plan, set goals, implement and assess the plan.
- Review all student applications and in conjunction with the Coordinator, decide the disposition of applications as to acceptance or rejection in a timely manner.
- Make recommendations to the Coordinator regarding the financial support of graduate students for their first year.
- Review the Mathematics and Science Education Ph.D. Program curriculum.
- Make recommendations for curricular improvements/renewal.

Other Committees

Other ad hoc committees may be appointed by the Faculty Committee and Coordinator as needed. Addition of new, or changes to the existing, standing committees must be approved by amendment of bylaws.

VI. Graduate Student Committees

The initial selection, or subsequent changes, of a graduate student's committee shall be determined jointly by the student and the student's advisor. In accordance with the Policies and Procedures of the Graduate School at WSU, graduate students are not permitted to serve on the committees of other graduate students.

The graduate committee of each student shall have a minimum of three members for all College of Education graduate degrees.

The committee chair requires tenure track and Mathematics and Science Education Ph.D. Program Graduate Faculty status, with the exception that the Graduate Faculty can approve a clinical faculty member as chair on a case by case basis, as described in Section II.A.5. In all cases, at least two of the committee members must be active Mathematics and Science Education Ph.D. Program Graduate Faculty members and at least two of these members must hold permanent WSU tenure-track status. All committee members must hold a graduate doctoral degree comparable to the degree sought by the candidate.

Fourth committee member: For any non-WSU member, or for any non-tenured/non-tenure track WSU faculty outside the Graduate Program, please attach a vitae and include a rationale in the Program of Study to be reviewed for approval by the Dean of the Graduate School.

The Chair of the Department of Teaching and Learning must approve the committee composition. As specified in the Graduate School's Policies and Procedures, the performance of each graduate student shall be reviewed annually.

VII. Student Representatives

At the discretion of the Mathematics and Science Education Ph.D. Program Coordinator and Faculty, student representation may be added or deleted from any committee structure. In accordance with the Policies and Procedures of the Graduate School at WSU, graduate students are not permitted to serve on the committees of other graduate students.

VIII. Graduate Faculty Meetings

- A. The Mathematics and Science Education Ph.D. Program Coordinator shall call Mathematics and Science Education Ph.D. Program Graduate Faculty meetings as needed but at least once per academic year. All attempts will be made to provide a written agenda in advance.
- B. Other meetings may be called at the discretion of the Coordinator or the Faculty Committee.
- C. A special meeting of the Mathematics and Science Education Ph.D. Program Graduate Faculty may be called by petition of 3 or more Graduate Faculty members.
- D. Efforts will be made to communicate items of interest, including notification of a faculty meeting, to the faculty via e-mail. Mathematics and Science Education Ph.D. Program Graduate Faculty Meetings shall be called with a minimum of 1 week's notice.

IX. Quorum

For all general graduate faculty meetings and votes unless otherwise indicated, a quorum shall be defined as a minimum of 50 percent of the Program membership.

For programmatic committees to conduct a business meeting, a quorum shall be defined as a minimum of 50 percent of the committee membership.

Unless otherwise indicated, a simple majority of the total number of ballots cast are required to pass a motion.

In the event of a tie vote in which the entire graduate faculty is eligible to vote, the Program Director will decide the outcome of the vote. For tie votes that occur within programmatic committees, the committee chair will decide the outcome of the vote.

X. Amendments to Program Bylaws

- A. The Program Bylaws document shall be reviewed every fifth year by the Faculty Committee and annually by the Coordinator.
- B. Amendments to the Bylaws may originate from any eligible Mathematics and Science Education Ph.D. Program Graduate Faculty member. Proposed amendments must be forwarded to the Mathematics and Science Education Ph.D. Program Faculty Committee and Program Coordinator. After discussion, amendments shall be forwarded to the Mathematics and Science Education Ph.D. Program Graduate Faculty electronically at least 2 weeks prior to the faculty meeting at which the amendments will be discussed. After discussion, a minimum 2-week period will follow the faculty meeting prior to vote. Votes on amendments may occur at a faculty meeting or electronically. Amendments to the Mathematics and Science Education Ph.D. Program Bylaws require a positive vote from the majority of all active Mathematics and Science Education Ph.D. Program Graduate Faculty.
- C. All amendments and revisions must be submitted to the Department of Teaching and Learning, the Graduate Studies Committee and Faculty Senate for review and final approval.

XI. List of Initial Graduate Faculty Participants

List of initial Mathematics and Science Education Ph.D. Program Graduate Faculty Participants:

Andy Cavagnetto

Jo Clay

Jonah Firestone

Janet Hart Frost

Richard Lamb

Kristin Lesseig

Amy Roth McDuffie

Judy Morrison

Tamara Holmlund Nelson

David Slavit

The Coordinator of the Mathematics and Science Education Ph.D. Program is responsible for submitting an updated list of active and inactive Mathematics and Science Education Ph.D. Program Graduate Faculty participants to the Chair of the Department of Teaching and Learning and the Dean of the Graduate School for approval annually.