

From: noreply@wsu.edu
To: [curriculum.submit](#)
Subject: 039 524264 Mathematics and Statistics Requirements Revise - Revise or Drop Graduate Plan
Date: Monday, August 19, 2019 11:55:28 AM
Attachments: [2019.08.19.11.55.20.44.FormData.html](#)
[2019.08.19.11.55.19.41.currentCatalogFile_MS_Math_Teaching_Rationale.docx](#)
[2019.08.19.11.55.19.41.currentCatalogFile1_MS_Math_Teaching_Updated_GS_Requirements.docx](#)
[2019.08.19.11.55.19.41.currentCatalogFile2_MS_Math_Teaching_Current_Handbook.pdf](#)
[2019.08.19.11.55.19.41.currentCatalogFile3_MS_Math_Teaching_Proposed_Handbook.pdf](#)

Emily Lewis has submitted a request for a major curricular change. His/her email address is:
emily.m.lewis@wsu.edu.

Requested change: Revise or Drop Graduate Plan

Degree: M.S. in Mathematics

Title: (Non-thesis) Mathematics Teaching

Requested Effective Date: Fall 2020

Revise plan requirement: Yes

Dean: Swindell, Samantha - CAS,

Chair: Moore, Charles,

Catalog Subcommittee
Approval Date

AAC, PHSC, or GSC
Approval Date

Faculty Senate
Approval Date

From: [Swindell, Samantha](#)
To: [curriculum.submit](#); charles.n.moore@wsu.edu
Subject: RE: 039 524264 Mathematics and Statistics Requirements Revise - Revise or Drop Graduate Plan
Date: Thursday, August 22, 2019 9:59:05 AM

1. I approve this proposal in its current form.

From: curriculum.submit@wsu.edu <curriculum.submit@wsu.edu>
Sent: Monday, August 19, 2019 11:55 AM
To: charles.n.moore@wsu.edu; Swindell, Samantha <sswindell@wsu.edu>
Subject: 524264 Mathematics and Statistics Requirements Revise - Revise or Drop Graduate Plan

Moore, Charles,

Swindell, Samantha - CAS,

Emily Lewis has submitted a request for a major curricular change.

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Revise plan requirement: Yes

Both Chair and Dean approval is required to complete the submission process. Please indicate that you have reviewed the proposal by highlighting one of the statements below and **reply all** to this email. (curriculum.submit@wsu.edu.) [Details of major change requested can be found in the attached supplemental documentation]

1. I approve this proposal in its current form.
2. I approve this proposal with revisions. Revisions are attached.
3. I do not approve this proposal. Please return to submitter.

If you do not respond within one week, you will be sent a reminder email. If no response is received within three weeks of the submission date, the proposal will be returned to the submitter.

Thank you for your assistance as we embark on this new process. If you have any questions or concerns, please let us know wsu.curriculum@wsu.edu.

From: [Moore, Charles](#)
To: [curriculum.submit](#)
Subject: Re: 039 524264 Mathematics and Statistics Requirements Revise - Revise or Drop Graduate Plan
Date: Monday, August 19, 2019 2:25:06 PM

1. I approve this proposal in its current form.

Charles Moore
Professor of Mathematics
Chair, Department of Mathematics and Statistics
Washington State University
Pullman, Washington 99164
On 8/19/2019 11:55 AM, curriculum.submit@wsu.edu wrote:

Moore, Charles,

Swindell, Samantha - CAS,

Emily Lewis has submitted a request for a major curricular change.

Requested change: Revise or Drop Graduate Plan

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The current MS Mathematics (Teaching Option) degree only specifies 19 graded credit hours. The following changes are requested to clarify program requirements and require 26 graded credit hours from an approved list of courses.

- Math 533 Teaching College Mathematics is a one-credit hour graded course that students must now take three times instead of once.
- Math 534 Teaching and Learning in Mathematics was added to the core required courses. This is a fundamental Mathematics Education course.
- Four courses are now required from the list of approved electives instead of three, in order to increase the number of graded credits required.
- Out of the list of electives, several courses were removed because they are no longer in the catalog, including Math 509, Math 550, Math 443, Math 510, Math 568, Math 569, and Math 573.
- Math 466 was removed from the Group 3 elective lists as it is crosslisted with Math 566 and graduate students in this program should be taking the graduate-level version of the course.
- Stat 575 was added as an acceptable elective to Group 2 electives and Math 579 was added as an acceptable elective to Group 3 electives. Both of these courses were deemed appropriate additions and are now being taught regularly in the department.
- The practicum requirement of Math 497 (2 credits) was removed. It is no longer standard practice to have graduate students take course credit for tutoring at the MLC.
- The instruction seminar requirement of Math 597 (2 credits) was increased to 3 credits. Two of these credits will be taken when teaching an undergraduate math course (required two semesters) and one credit will be taken while shadowing the instructor Math 251 or 252 during one semester. This is a course for undergraduates majoring in Education about teaching mathematics, and may be something a graduate from this program is asked to teach in a future instructor position.
- All changes were first approved by the departmental Graduate Studies Committee and then by a quorum of the graduate faculty in Mathematics & Statistics, including faculty at the Vancouver and Everett campuses on February 14, 2019.

Graduate School Requirements issued 5/31/19

Teaching Track:

- Proseminar: must complete the following (1 credit):
 - MATH 500
- Core: must complete all 4 5 of the following (15 credits):
 - MATH 501, MATH 531, MATH 532, MATH 533 (3 credit hours), MATH 534
- Graduate Electives: 9 12 credits minimum, at least one course from each group
 - Group One Electives: 3 credits minimum:
 - MATH 505, MATH 507, ~~MATH 509~~, MATH 550, MATH 553, MATH 555
 - Group Two Electives: 3 credits minimum:
 - MATH 443 or STAT 443, MATH 510, MATH 568, ~~MATH 569~~, MATH 573, STAT 510, STAT 519, STAT 533, STAT 544, STAT 548, STAT 549, STAT 573, STAT 575
 - Group Three Electives: 3 credits minimum:
 - MATH 464, ~~MATH 466~~, MATH 508, MATH 540, MATH 541, MATH 548, MATH 563, MATH 564, MATH 565, MATH 566, MATH 567, MATH 570, MATH 571, MATH 574, MATH 579, MATH 586
- ~~Practicum: 2 credits minimum:~~
 - ~~MATH 497~~
- Instruction Seminar: 3 credits minimum:
 - MATH 597
- Research Credits: 4 credits minimum:
 - MATH 702
- Total Graded Credits: 26 credits minimum
- Total Credits: 35 credits minimum

Applicable Graduate School Requirements (Teaching Track):

- Required Courses: must complete both of the following:
 - MATH 500, MATH 501
- Graded Credits: 26 credits minimum:
 - Students may use a maximum of 6 credits of undergraduate coursework (300-400)
- Research Credits: 4 credits minimum
 - MATH 702
- Total Credits: 35 credits minimum

1.1 THE M.S. IN MATHEMATICS – MATHEMATICS TEACHING OPTION

Description and Learning Outcomes – This is a two-year professional degree designed to prepare teachers of mathematics at the community college, four-year college, or secondary levels. The program combines advanced work in mathematics with coursework in education and practice teaching, providing a foundation in both mathematical content and teaching methodology.

This M.S. program is designed to meet the following learning outcomes:

- **Critical thinking:** Students will have developed the skills necessary to critically read and evaluate both practitioner and research articles in mathematics education journals.
- **Pedagogical content knowledge:** Students will have the mathematical knowledge necessary to teach upper secondary and lower level college mathematics.
- **Effective communication:** Students will be able to speak effectively about mathematics, and write scholarly contributions to practitioner journals.

Courses – A candidate must complete 35 semester hours of approved graduate work, both in mathematical content and teaching methods. This must include 27 semester hours of graded course work and 8 semester hours of non-graded work.

Required Courses: Math 500 Proseminar (1 credit)
(5 credits) Math 702 (4+ credits)

Core Courses: Math 501 Real Analysis (3 credits)
(15 credits) Math 531 Intersections of Culture and Mathematics (3 credits)
Math 532 Advanced Mathematical Thinking (3 credits)
Math 533 Teaching College Mathematics (3 credits)
Math 534 Theories of Learning in Mathematics (3 credits)

Practical Training: Math 597 Instruction Seminar (1 credit/semester, 3 semesters)
(3 credits) One semester shadowing Math 251 or 252 Fundamentals of Mathematics for elementary teachers
Two or more semesters teaching an undergraduate math course

Graduate Electives: Four courses from the following list; at least one course must be
(12 credits) included from each of the three groups

| | |
|---|---|
| Group 1: Algebra, Discrete Math, & Geometry | Math 505 Abstract Algebra Math 507 Advanced Theory of Numbers Math 553 Graph Theory Math 555 Topics in Combinatorics |
|---|---|

| | |
|---|--|
| Group 2: Probability & Statistics | Stat 443 Applied Probability Stat 510 Topics in Probability and Statistics Stat 519 Applied Multivariate Analysis Stat 544 Applied Stochastic Processes Stat 548 Statistical Theory I Stat 549 Statistical Theory II Stat 573 Reliability Stat 575 The Theory of Multivariate Analysis |
| Group 3: Applied & Numerical | Math 464 Linear Optimization Math 566 Optimization in Networks Math 508 Advanced Math Methods for Physics and Engineering Math 540 Applied Mathematics I Math 541 Applied Mathematics II Math 548 Numerical Analysis Math 563 Mathematical Genetics Math 564 Convex and Nonlinear Optimization Math 565 Nonsmooth Analysis and Optimization with Applications Math 567 Integer and Combinatorial Optimization Math 570/Math 571 Mathematical Foundations of Continuum Mechanics I & II Math 574 Topics in Optimization Math 579 Math Modeling in the Bio and Health Sciences Math 586 Math Modeling in the Natural Sciences |

Math 702 and MS Examination – The four required hours of Math 702 involve independent study under the guidance of a faculty member, normally the chair of the student’s advisory committee. The topic of the study must pertain to curricular and pedagogical issues relevant to teaching mathematics. The results of this study are often summarized in a paper, but this is not mandatory. In addition, students must complete a final oral examination, covering the student’s coursework and the content of Math 702, 401, 402, 420, and 421. This will include an oral presentation on the results of the student’s Math 702 project. The student’s advisory committee will conduct this examination when all other requirements for graduation have been fulfilled. The format of the final examination, project, and/or paper is at the discretion of the advisory committee.

Current February 16

6 The MS in Mathematics (Mathematics Teaching Option)

6.1 Description and Learning Outcomes

This is a two-year professional degree designed to prepare teachers of mathematics at the community college, four-year college, or secondary levels. The program combines advanced work in mathematics with coursework in education and practice teaching, providing a foundation in both mathematical content and teaching methodology.

This MS program is designed to lead the student to the following learning outcomes:

1. Critical thinking: Students will have developed the skills necessary to critically read and evaluate both practitioner and research articles in mathematics education journals.
2. Pedagogical content knowledge: Students will have the mathematical knowledge necessary to teach upper secondary and lower college level mathematics.
3. Effective communication: Students will be able to speak effectively about mathematics, and write scholarly contributions to practitioner journals.

Departmental requirements and regulations for the Mathematics Teaching Option of the MS degree are specified below. The regulations of the Graduate School for master's programs are available in the Graduate School Policies and Procedures Manual.

6.2 Prerequisites

Same as in §3.2.

6.3 Courses and Hours

A candidate must complete 35 semester hours of approved graduate work, both in mathematical content and teaching methods. This must include 26-semester hours of graded course work.

(a) Mathematics Content

Required Courses: Math 500, 501, and at least four credits of Math 702

Mathematics Electives: at least one course must be included from each of the following three areas:

Algebra/Discrete Mathematics/Geometry: Math 505, 507, 509, 550, 553, 555

Probability/Statistics: Math 443, Stat 510, 519, 533, 544, 548, 549, 573

Applied/Numerical: Math 464, 466, 508, 540, 541, 548, 563, 564, 565, 566, 567,
570, 571, 574, 586

(b) Mathematics Education

Required Courses: Math 531, 532, 533

Teaching Practicum: Math 497 (1 semester, 2 credits), Math 597 (2 semesters)

6.4 Transfer Credit

Up to six hours of transfer credit may be given for suitable course work done at another university. Transfer credit is requested by listing the courses on the Program of Study (see §3.5); approval of the Program of Study implies approval of transfer of credit. Other general regulations regarding Transfer Credit can be found in Chapter 6 of the Graduate School Policies and Procedures Manual.

6.5 The Program of Study

Same as in §3.5.

6.6 The MS Examination

Each Master's student must pass a final oral examination that will cover all of the student's course work plus the content of Math 401–402 (analysis) and 420–421 (linear and abstract algebra) and include an oral presentation on the results of the student's Math 702 project. The student's advisory committee will conduct this examination.

6.7 The Application for Degree

Same as in §3.7.

6.8 Thesis

There is no thesis requirement. However, the student must complete four hours of Math 702. This involves independent study under the guidance of a faculty member, normally the chair of the student's advisory committee. The topic of the study must pertain to curricular and pedagogical issues relevant to teaching mathematics. The results of the project are usually summarized in a paper, although this is not mandatory.