

**From:** [noreply@wsu.edu](mailto:noreply@wsu.edu)  
**To:** [curriculum.submit](#)  
**Subject:** 037 524258 Mathematics and Statistics Reqs Revise - Revise or Drop Graduate Plan  
**Date:** Monday, August 19, 2019 11:41:49 AM  
**Attachments:** [2019.08.19.11.41.42.52.FormData.html](#)  
[2019.08.19.11.41.41.66.currentCatalogFile\\_MS\\_Math\\_Rationale.docx](#)  
[2019.08.19.11.41.41.66.currentCatalogFile1\\_MS\\_Math\\_updated\\_GS\\_requirements.docx](#)  
[2019.08.19.11.41.41.66.currentCatalogFile2\\_MS\\_Mathematics\\_2016\\_handbook.pdf](#)  
[2019.08.19.11.41.41.66.currentCatalogFile3\\_MS\\_Math\\_updated\\_handbook\\_page.pdf](#)

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

**Requested change:** Revise or Drop Graduate Plan

**Degree:** M.S. in Mathematics

**Title: CSC Note:** General

**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](mailto:charles.n.moore@wsu.edu)  
**Subject:** RE: 037 524258 Mathematics and Statistics Requirements Revise - Revise or Drop Graduate Plan  
**Date:** Thursday, August 22, 2019 9:58:46 AM

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1. I approve this proposal in its current form.

**From:** curriculum.submit@wsu.edu <curriculum.submit@wsu.edu>  
**Sent:** Monday, August 19, 2019 11:42 AM  
**To:** charles.n.moore@wsu.edu; Swindell, Samantha <sswindell@wsu.edu>  
**Subject:** 524258 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.

**Requested change:** Revise or Drop Graduate Plan

**Degree:** M.S. in Mathematics

**Title:**

**Requested Effective Date:** Fall 2020

Revise plan requirement: Yes

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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](mailto: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](mailto:wsu.curriculum@wsu.edu).

**From:** [Moore, Charles](#)  
**To:** [curriculum.submit](#)  
**Subject:** Re: 524258 Mathematics and Statistics Requirements Revise - Revise or Drop Graduate Plan  
**Date:** Monday, August 19, 2019 2:24:33 PM

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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 11:41 AM, [curriculum.submit@wsu.edu](mailto: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

**Degree:** M.S. in Mathematics

**Title:**

**Requested Effective Date:** Fall 2020

Revise plan requirement: Yes

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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

**June 11, 2019**

### **MS Mathematics Rationale for Updates**

This is a general mathematics degree (non-thesis) that provides flexibility to the student and their faculty advisor to design a plan of study relevant to their interests and research area. As such, we have increased the number of courses that can be applied to the degree.

- Additional courses were added to the list of electives
  - Math 524 & 529 are recently developed courses that will count towards the degree
  - Any Stats courses between 508-577 (including Stat 443 and excluding Stat 511) were determined to count towards the degree, so 14 Stat courses were added as options.
  - Only 6 of the 18 required credits can be courses with the STAT prefix, to preserve the integrity of the MS Mathematics degree.
- Additional electives (6 credits) were added as a requirement to bring the required graded credits up to 27.
  - These have no limitations and can be courses taken outside the department, should the student wish to pursue interdisciplinary study.

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  
Mathematics MS (Non-Thesis):**

**General Track:**

- Proseminar: must complete the following:
  - MATH 500
- Real Analysis: must complete the following:
  - MATH 501
- Graduate Electives: 18 credits minimum:
  - MATH 502, MATH 503, MATH 504, MATH 505, MATH 507, MATH 508, ~~MATH 510~~, MATH 511, MATH 512, MATH 516, ~~MATH 523~~, MATH 524, MATH 525, MATH 529, MATH 531, MATH 532, MATH 533, MATH 534, MATH 535, MATH 536, MATH 540, MATH 541, MATH 543, MATH 544, MATH 545, MATH 546, MATH 548, MATH 553, MATH 555, ~~MATH 556~~, MATH 560, MATH 561, MATH 563, MATH 564, MATH 565, MATH 566, MATH 567, MATH 568, MATH 569, MATH 570, MATH 571, ~~MATH 573~~, MATH 574, MATH 586, STAT 443, STAT 508, STAT 510, STAT 512, STAT 516, STAT 519, STAT 520, STAT 522, STAT 523, STAT 530, STAT 533, Stat 535, STAT 536, STAT 544, STAT 548, STAT 549, STAT 556, STAT 565, STAT 572, STAT 573, STAT 574, STAT 575, STAT 576, or STAT 577.
  - Note: A maximum of 6 credits can be from courses in STATISTICS.
- Additional Electives: 6 credits minimum
  - Subject to approval by student's advisory committee
- Research Credits: 4 credits minimum:
  - MATH 702
- Total Graded Credits: 26 credits minimum
- Total Credits: 32 credits minimum

**Applicable Graduate School Requirements (General, Applied, and Computational Finance Tracks):**

- Required Course: must complete the following:
  - MATH 500
- Graded Credits: 26 credits minimum:
  - Students may use a maximum of ~~6~~ **9** credits of undergraduate coursework (maximum of 3 credits of 300-level, maximum of 9 credits of 400-level)
- Research Credits: 4 credits minimum
  - MATH 702
- Total Credits: 31 credits minimum

## 1.1 THE M.S. IN MATHEMATICS

**Description and Learning Outcomes**– This broadly defined program provides flexibility for students to design a course of study according to their interests, particularly in pure mathematics. It can also lay a solid foundation for further doctoral study in Mathematics, working in industry, or for teaching at the high school, community college, or university level as an instructor. This MS program is designed to lead the student to the following learning outcomes:

- **Problem Solving:** Students will be able to identify mathematical and computational methods in order to solve problems.
- **Deductive Thinking:** Students will be able to read and write logical arguments in order to prove advanced mathematical results.
- **Effective Communication:** Students will be able to effectively communicate mathematical concepts, problems and their solutions in written and oral form.

**Courses** – The M.S. in Mathematics requires at least 32 semester hours of approved graduate work. Math 501, Math 500, and four hours of Math 702 are the only required courses for the degree; the remaining 24 hours must be graded coursework selected from the options listed below. At least 18 of these hours must be from the approved list of mathematics and statistics graduate electives below. The remaining 6 hours of graded credit are elective and may be taken in other departments with approval of the advisor through the submission of a program of study. These may include 500-level courses, a maximum of two 400-level courses, and up to one 300-level course (if in another department).

Required courses: (5 credits)	Math 500 Math 702	Proseminar (1 credit) Directed Study (4+ credits)
Core Courses: (3 credits)	Math 501	Real Analysis (3 credits)
Math/Stat Electives (18+ credits)	6 courses	chosen from: Math 502-574, Math 586 Stat 508-577, including Stat 443 and excluding Stat 511. A maximum of 2 Statistics courses can be counted.
Additional Electives (6 credits)	2 courses	Any Department

**Math 702 and M.S. 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 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 content of the student's coursework including Math 702, 401, 402, 420, and 421 (Analysis, Linear Algebra, and Abstract Algebra). The format for the final examination is at the discretion of the student's committee, and it is the student's responsibility to be aware of their requirements. The student's committee will conduct this examination when all other requirements for graduation have been fulfilled.

## 3 The MS in Mathematics

Current, February 2016

### 3.1 Description and Learning Outcomes

The degree of Master of Science (MS) in Mathematics represents substantial mathematical training beyond the baccalaureate, which is sufficient for many career goals. Doctoral students complete most of the MS requirements in the course of their studies, and often receive an MS degree as an intermediate step en route to the doctorate. However, the MS degree is efficacious in its own right, and is not necessarily a stepping stone to a doctoral degree. Furthermore, attainment of the MS degree does not guarantee admission to a doctoral program.

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

1. Problem Solving: Students will be able to identify mathematical and computational methods in order to solve problems.
2. Deductive Thinking: Students will be able to read and write logical arguments in order to prove advanced mathematical results.
3. Effective Communication: Students will be able to effectively communicate mathematical concepts, problems and their solutions in written and oral form.

Departmental requirements and regulations for 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.

### 3.2 Prerequisites

All graduate students are expected to have a background in mathematics equivalent to that provided by our undergraduate degree. Ideally, this would include familiarity with the material covered in Math 401 and 402, and Math 420 and 421, and some experience with computer programming. Students with a deficient background are expected to make up these deficiencies at the earliest opportunity.

### 3.3 Courses and Hours

A candidate must complete 31 semester hours of approved graduate work, including Math 501. These courses must be numbered 400 or above (except for up to 3 hours of 300 level courses in other areas) and must include 26 hours of graded course work. At least 18 of these hours must be in mathematics courses numbered between 501 and 574, or Math 586, or statistics courses numbered 519, 533, 544, 548, 549, 573. At least four hours of Math 702 and one hour of Math 500 are required.

### 3.4 Transfer Credit

Up to eight hours of transfer credit may be given for suitable course work done elsewhere. 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.



### **3.5 The Program of Study**

A Program of Study must be submitted by the deadlines indicated in §2. It is however suggested that this be done in the second semester of graduate work. The appropriate form is available at the Graduate School Office or may be downloaded from its web site.

### **3.6 The MS Examination**

Each master's student must pass a final oral examination, which will cover all of the student's course work including Math 702 (see §3.8 below) plus the content of Math 401, 402, 420 and 421. This examination may be scheduled when all requirements of the Department and the Graduate School have been satisfied (or are expected to be satisfied by the end of the current semester). The deadlines for scheduling this examination are indicated in §2. The student's advisory committee will conduct this examination.

### **3.7 The Application for Degree**

An Application for Degree must be filed with the Graduate School by the deadlines in §2. An approved Program of Study must be on file in the Graduate School before the Application for Degree may be filed. Candidates may not schedule a final examination until an Application for Degree has been filed.

### **3.8 Thesis**

There is no thesis requirement. However, a master's student must take 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 results of this study are often summarized in a paper, but this is not mandatory.