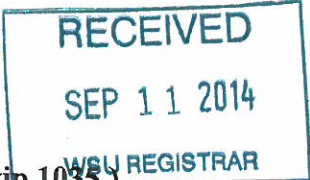**Washington State University**
MAJOR CHANGE FORM - - REQUIREMENTS
(Submit original signed form and <u>TEN</u> copies to the Registrar's Office, zip 1035.)
See https://www.ronet.wsu.edu/ROPubs/Apps/HomePage.ASP for this form.

*Submit an additional copy to the Faculty Senate Office, French Administration 338, zip 1038.

Department Name Mathematics _____

1. **CHECK PROPOSED CHANGES.**
   *☐ Change department/program name *from* _____ *to* _____
   *☐ New degree or program *in* _____
   *☐ Change name of degree *from* _____ *to* _____
   *☐ Drop degree or program *in* _____
   *☐ Extend existing degree or program *to* _____ campus

   ☐ New Major *in* _____
   ☐ Change name of Major *from* _____ *to* _____
   ☑ Revise Major requirements *in* MS in Mathematics _____
   ☐ Drop Major *in* _____
   ☐ Revise certification requirements for the Major *in* _____

   ☐ New Option *in* _____
   ☐ Revise requirements for the Option *in* _____
   ☐ Drop Option *in* _____

   ☐ New Minor *in* _____
   ☐ Revise Minor requirements *in* _____
   ☐ Drop Minor *in* _____

   ☐ New Undergraduate Certificate *in* _____
   ☐ Revise Undergraduate Certificate requirements *in* _____
   ☐ Drop Undergraduate Certificate *in* _____

   ☐ Other _____

Effective term/year Fall 2015 _____

Michael Tsatsomeros	(509) 335-3144	tsat@wsu.edu
Contact Person	**Contact Phone No.**	**Contact email**

2. **GIVE REASONS FOR EACH REQUEST MARKED ABOVE.** *(Attach additional paper if necessary; see reverse side.)* Rationale attached separately

4. **SIGN AND DATE APPROVALS.**

Charles Moore 8/2/14 / *Amy Rodgwell 9/3/14* _____
Chair Signature/date / Dean Signature/date / General Education Com/date

_____ _____ _____ _____
Catalog Subcom/date   Academic Affairs Com/date   Graduate Studies Com/date   Senate/Date

Justification for the proposed change

The Graduate Faculty of Mathematics debated the issue of removing Math 502 (Introduction to Functional Analysis) as a required course for the MS in Mathematics and the MS in Mathematics (Mathematics Teaching Option) over two meetings. In April of 2014 the Graduate Faculty voted in favor of a relevant motion put forward by the Mathematics Graduate Studies Committee. The rationale for the motion and the faculty decision is two-fold:

(1) In both MS degrees mentioned above, preparation in theoretical mathematics is important. There are, however, several courses that serve this purpose beside a second course in Analysis. The Graduate Faculty feels it is important to allow students and their advisory committees more flexibility in course selection in order to set and fulfill their educational goals. Thus, it was decided to retain Math 501 as a required course but to remove the Math 502 requirement.

(2) Math 502 has been removed as a required course in the PhD in Mathematics since 2006, essentially for the reason mentioned in (1) above. Several of our PhD students end up pursuing the MS degree either on the way to the PhD or instead of a doctorate degree. Thus, under the proposed change, the MS and PhD in Mathematics degrees

   (i) will be better aligned, and

   (ii) changes and/or deviations from policy in the Programs of Study will be avoided.

The proposed changes pertain only to the description of the two MS degrees in the Mathematics Graduate Student Handbook (http://www.math.wsu.edu/info/hb.pdf) and do not apply to any entries in the Graduate Catalog. The editorial changes are minimal and are shown in the attached current and future pages of the handbook.

3 The MS in Mathematics (Current Handbook)

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 **and 502**. 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.

3 The MS in Mathematics (Proposed Handbook)

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.

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