After college/school/campus review, send a signed original and 1 copy to the Curriculum Office/FCAS, Box 355850.

For information about when and how to use this form: http://depts.washington.edu/uwcr/1503instructions.pdf

| College/Campus | BOTHELL | Department/Unit | STEM/ST MATH | Date | 1-24-2014 |

New Programs

☐ Leading to a Bachelor of _____ in _____ degree.

☐ Leading to a Bachelor of _____ degree with a major in _____.

☐ Leading to a _____ Option within the existing major in _____.

X Leading to a minor in <u>MATHEMATICS</u>

Changes to Existing Programs

☐ New Admission Requirements for the Major in _____ within the Bachelor of _____.

☐ Revised Admission Requirements for the Major in _____ within the Bachelor of _____.

☐ Revised Program Requirements for the Major in _____ within the Bachelor of _____.

☐ Revised Requirements for the Option in _____ within the major in _____.

☐ Revised Requirements for the Minor in _____.

Other Changes

☐ Change name of program from _____ to _____.
☐ Change delivery method or location of program.
☐ New or Revised Continuation Policy for _____.
☐ New Honors Requirements for _____.
☐ Eliminate program in _____.

Proposed Effective Date: **Quarter:** ☐ Autumn ☐ Winter X **Spring** ☐ Summer **Year: 20~~14~~ 15**

| Contact Person: | Linda Simonsen | 425-352-3223 | Email: | LSimonsen@uwb.edu | Box: 358538 |

EXPLANATION OF AND RATIONALE FOR PROPOSED CHANGE

For new program, please include any relevant supporting documentation such as student learning outcomes, projected enrollments, letters of support and departmental handouts. (*Use additional pages if necessary*).

PROPOSAL ATTACHED

OTHER DEPARTMENTS AFFECTED

List all departments/units/ or co-accredited programs affected by your new program or changes to your existing program and acquire the signature of the chair/director of each department/unit listed. Attach additional page(s) if necessary. *See online instructions.

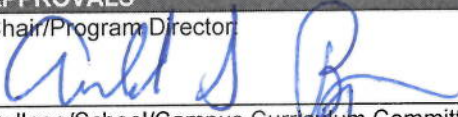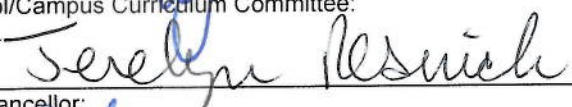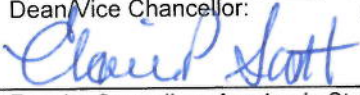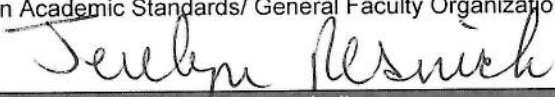| Department/Unit: | Chair/Program Director: | Date: |
| Department/Unit: | Chair/Program Director | Date: |

Catalog Copy as currently written. Include only sections/paragraphs that would be changed if your request is approved. Please cross out or otherwise highlight any deletions.

Proposal Attached

Reflecting requested changes (Include exact wording as you wish it to be shown in the printed catalog. Please underline or otherwise highlight any additions. If needed, attach a separate, expanded version of the changes that might appear in department publications).
Please note: all copy <u>will</u> be edited to reflect uniform style in the General Catalog.

	Date:
Chair/Program Director:	1/27/14
College/School/Campus Curriculum Committee: Jerelyn Resnick	10-10-14
Dean/Vice Chancellor: Claire Scott	1/27/14
Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair: Jerelyn Resnick	10/10/14

	Date:
Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:	

UW

UNIVERSITY OF WASHINGTON

BOTHELL

Office of the General Faculty Organization

To: Bjong Wolf Yeigh, Chancellor

From: Jerelyn Resnick, Chair, GFO Executive Council

Copy: Susan Jeffords, Vice Chancellor for Academic Affairs,
       Kari Lerum, Chair, GFO

RE: GFO Executive Council Endorsement to Forward the STEM Proposal for a Minor in
       Mathematics to the UW Registrar for Tri-campus Review.

Date: May 20, 2014

       On Tuesday, May 20, 2014, the General Faculty Organization's Executive Council
       endorsed forwarding the STEM proposal for a Minor in Mathematics to the UW
       Registrar for Tri-campus Review.

Proposal for a Minor in Mathematics
Engineering and Mathematics
School of STEM
University of Washington Bothell

I.   Overview

We propose a Minor in Mathematics. While expanding opportunities for students across discipline the Minor will increase the depth and focus of the Engineering & Mathematics Division and the School of STEM.

II.   Description & Rationale

Along with the newly offered BS in Mathematics, the Minor in Mathematics will help to establish mathematics as an important component of STEM curriculum. It will contribute to the identity of STEM and position it as a school of choice to prospective students by making explicit an option in a central area that is served by peer institutions. More specifically, the minor speaks to the following statement in the STEM Mission:

Create STEM (as supported by the National Science Foundation) degrees that are recognizable and address the needs of high school students, parents, employers, and graduate/professional schools.

III.   Student Demand and Impact

Advanced knowledge of mathematics and mathematical techniques are useful to a wide range of disciplines including computer science, Chemistry, Biology and engineering. The minor is most attractive to students if it can be achieved with modest effort beyond their major and provides a "value added" credential to their record. For students in science and engineering, a minor in mathematics will convey that student interest and skills in the underlying foundational aspects and tools of their discipline. It is thought that many employers value mathematical skills, which are often associated with other technical skills. Mathematically trained people are often valuable as employees who can bring the ability to analyze and solve problems of a quantitative nature. Having a minor in mathematics can give students a competitive edge for admission to a range of graduate school programs.

Examples of majors that align with the minor:
Electrical Engineering majors.

Initially, this will be our largest group of students. They will be able to earn the minor by taking only one additional course beyond the mathematics expected of them as EE majors. Presently a number of these students are taking the math minor offered by UWS. The UWB minor will be more convenient for them. It is estimated that at least 10-12 EE majors will be Math Minors or Majors each year. (The new Mechanical Engineering degree will also have students in a similar situation as those in EE.)

Climate Science majors.

Climate Science majors in the modeling intensive track will find the minor to be attractive, as it may require as few as three additional courses beyond what they will be advised to take. Some climate science students may be interested in graduate school in atmospheric chemistry or related fields. This math credential will give them an advantage in the admission process. There could be several students each year (3-5) at program maturity.

CSS majors.

Some CSS majors have quite strong math backgrounds and would only need approximately three additional mathematics courses. They often take three calculus courses, linear algebra and a statistics course. There could be potentially 2-3 students per year.

Prospective physics and chemistry majors.

Presently, students interested in majoring in these areas must plan on transferring as juniors to another campus or university. The math minor will increase their admissibility to these institutions. With a well-directed effort and perhaps some advanced placement credit, the minor can be achieved within two years. If they transfer to UWS, it will eventually be transcripted. If they transfer to another institution, they will not receive the minor, but will have a significant amount of math preparation on their record. We estimate that there could be as many five of these students each year.

We estimate that there will be approximately 25 students per year at program maturity, each taking 1 to 3 extra mathematics courses than required in their given major.

IV.   Curriculum Goals and Requirement

The proposed Minor in Mathematics requires 6 mathematics courses (at least 28 credits) with minimum grade of 2.0 in each course, distributed as follows:

1. Mathematics Core Requirement (2 courses [10 credits])
    STMATH 126 Calculus with Analytic Geometry III (5) [Prereq: STMATH 125]
    STMATH 300 Foundations of Modern Mathematics (5) [Prereq: STMATH 125]
2. Mathematics Elective Requirement (at least 4 courses and a minimum of 18 credits at the 300-level or above)

    ·   STMATH 307 Differential Equations (5) [Prereq: STMATH 125]
    STMATH 308 Matrix Algebra (5) [Prereq: STMATH 125]
    STMATH 310 Mathematical Game Theory (5) [Prereq: STMATH 125]
    STMATH 324 Multivariable Calculus I (5) [Prereq: STMATH 126]
    STMATH 326 Multivariable Calculus II (5) [Prereq: STMATH 324]
    STMATH 341 Introduction to Statistical Inference (5) [Prereq: STMATH 125]

STMATH 350 Applied Number Theory and Cryptography (5) [Prereq: STMATH 308]

STMATH 381 Discrete Mathematical Modeling (5) [Prereq: STMATH 308]

STMATH 390 Probability and Statistics in Engineering and Science (5) [Prereq: STMATH 126; may change to STMATH 341]

STMATH 402 Abstract Algebra I (5) [Prereq: STMATH 300 and STMATH 308]

STMATH 403 Abstract Algebra II (5) [Prereq: STMATH 402]

STMATH 420 History of Mathematics (5) [Prereq: STMATH 125]

STMATH 424 Introduction to Analysis I (5) [Prereq: STMATH 300 and STMATH 324]

STMATH 425 Introduction to Analysis II (5) [Prereq: STMATH 424]

STMATH 444 Foundations of Geometry (5) [Prereq: STMATH 126]

STMATH 465/BEDUC 465 Fostering Algebraic Reasoning (5) [Prereq: STMATH 125]

STMATH 466/BEDUC 466 Fostering Geometric Reasoning (5) [Prereq: STMATH 125]

STMATH 467/BEDUC 467 Fostering Data, Graphical & Statistical Understanding (5) [Prereq: STMATH 125]

STMATH 493 Special Topics in Mathematics (1-5, max. 15) [Prereq: STMATH 300]

One of BIS 315, BIS 329 or BIS 350

Note: A student cannot count both STMATH 341 and BIS 315 towards the math minor. It is expected that the elective course list would evolve with experience and curricular growth. The general guideline would be that all electives would depend upon Calc II as a prerequisite; however, a student may count one mathematics course for which Calc I is a prerequisite (e.g., BIS 315, BIS 329 or BIS 350).

V. Impact

Existing Courses: Most of the curriculum is already being offered or we have committed to offer them to support our electrical engineering major. We do not anticipate that any of these will be oversubscribed in the near future. The entire core curriculum must already be offered every year. No new sections would be required. Because the elective course list is larger than the number of required credits, not every course need be offered every year.

New Courses:

No new courses are needed for the minor in mathematics.