UNIVERSITY OF MARY WASHINGTON – PROGRAM CHANGE PROPOSAL
Electronically submit this completed form with attachments in one file to the Chair of the College Curriculum Committee.

<table>
<thead>
<tr>
<th>COLLEGE (check one):</th>
<th>Arts and Sciences</th>
<th>x</th>
<th>Business</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Submitted By:</td>
<td>Jackie Gallagher</td>
<td></td>
<td>Date Prepared: 9/30/2016</td>
<td></td>
</tr>
<tr>
<td>Department /Program:</td>
<td>Geography / Master of Science in Geospatial Analysis (MSGA)</td>
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</table>

Note: for any program change entailing the addition any new courses, or revisions to existing courses, separate proposal for those course actions must also be submitted.

PROPOSAL TO CHANGE EXISTING PROGRAM (check no than one of the following)

| Revise requirements for existing major |
| Revise requirements for a concentration within an existing major |
| Revise requirements for an existing degree program | x |
| Revise requirements for existing certificate program |
| Revise requirements for existing minor |
| Implementation Date: FALL semester, year: 2017 |

REQUIRED ATTACHMENTS FOR CHANGES TO EXISTING PROGRAMS:
1. Rationale statement (Why is this program change needed? What purposes will it serve?)
2. Impact Statement (Provide details about the Library, space, budget, technology, and impacts created by this program change. Supporting statements from the Library, IT Department, etc. evaluating the resource impact and feasibility of the program change are required.)
3. Catalog Copy (Provide the existing Catalog Description and the complete statement of the proposed new Catalog description that reflects the program changes)

PROPOSAL TO CREATE NEW PROGRAM NOT REQUIRING STATE ACTION
(check no more that one of the following)

| New concentration within existing major | Name: |
| New minor | Name: |
| New Major but NOT a new degree* | Name: |

*Use ONLY for interdisciplinary majors that will be grouped as part of the "Special Majors/General Liberal Arts and Sciences" degree (CIP Code 24.0101) or reported as a BLS degree (CIP Code 24.0199)

| Implementation Date (semester and year): |

REQUIRED ATTACHMENTS FOR NEW PROGRAMS NOT REQUIRING STATE APPROVAL:
1. Rationale statement (Why is this additional program needed? What purposes will it serve?)
2. Impact Statement (Provide details about the Library, space, budget, technology, staffing and curricular impacts created by this program change. Supporting statements from the Library, IT Department, etc. evaluating the resource impact and feasibility of adding the new program are required.)
3. Catalog Copy (Provide the complete Catalog Description for the proposed new program)
4. Any change that impacts another Department must have a written statement (such as a copy of an email) from the Chair(s) agreeing to the change.

| Department Chair Approval: | Date: 9/30/2016 |
| CCC Chair Approval: | Date: 10/19/2016 |
| Dean Approval: | Date: 10/20/16 |
| UCC Chair Approval: | Date: 11/14/2016 |

*Provost Approval:
*Required only in cases of proposals for new concentrations, new minors, or new majors that do not involve a new degree
Proposal for an Accelerated Program in the Master of Science in Geospatial Analysis

This proposal aims to create an Accelerated Degree Program for the Master of Science in Geospatial Analysis (MSGA), in which undergraduate students may complete two courses of the 6 course MSGA while they are working toward their bachelor’s degree. They would complete the remaining courses and the capstone project in the following academic year.

Undergraduate students may apply for provisional admission to the MSGA in the second semester of their junior year. While most juniors will have completed about 75 credits by this time, we have specified successful completion of 70 credits to add flexibility but to ensure that students would not be taking extreme course loads with these graduate courses in their senior year. Catalog language is written to allow for students planning to graduate in May or December, stating an application deadline of the Monday of the sixth week of the relevant semester (about Feb 20/Oct 3). This will give faculty enough time to review applications and notify students of their admission status by the start of the advising period (generally week 8, after fall and spring breaks) so that students can register appropriately for the following semester.

Students applying for this program may come from any major, provided that they have at least two GIS courses. While we would prefer more experience with GIS, this is the minimum for entry to the MSGA (designed to attract more applicants, particularly from outside UMW). Grades of B or higher must be earned in each GIS course to show proficiency. A minimum cumulative GPA of 2.7 is specified so as to include students who are just hitting their stride in a major or who excel at GIS but may not otherwise have excellent grades. While it is possible that the GIS courses might have been transferred in, a letter of recommendation letter from a UMW faculty member who teaches GIS is required to ensure that the student has sufficient background.

After provisional admission, students would take MSGA 510, Spatial Thinking in the fall semester of their senior year and MSGA 520, GeoDesign & GeoVisualization, in the spring semester of their senior year. These courses are not sequenced; 520 may be taken before 510. All undergraduate degree requirements have to be met; the student would graduate with their undergraduate class after completion of the bachelor’s degree. The two graduate courses would be considered elective credit.

These two graduate courses may count toward both the undergraduate and graduate degrees if the student is formally admitted to the graduate program within five years of completing the undergraduate degree. During or after the senior year, students would apply for formal admission to the MSGA.

Admission to the MSGA remains unchanged, requiring an undergraduate cumulative GPA of about 3.0; at least two GIS classes (students in the accelerated program would have two prior to entering the accelerated program); two letters of recommendation, one attesting to GIS proficiency; a resume; a goal statement; official transcripts and completed application.

This program would allow students to begin working on their master’s degree before obtaining the undergraduate degree, saving them time and money. It would encourage more students to enter the MSGA and better utilize our resources. A survey shows strong support for such a program among current juniors and seniors taking GIS courses.

On the following pages are a rationale, impact statement and catalog copy.
Rationale: Master of Science in Geospatial Analysis Accelerated Degree Program

The accelerated MSGA program is for undergraduate students who excel at geographic information science. Such students may apply for conditional admission to the MSGA while in their junior year, and if successful can take one graduate course in each semester of their senior year. These courses may count toward both undergraduate and graduate programs if the student is formally admitted to the MSGA within five years of being awarded the bachelor’s degree. In the following pages, 5 points are expounded upon:

1. Survey data indicate considerable interest in this accelerated program.
2. Overall enrollment in the MSGA is likely to increase – especially full-time enrollment. Classes will be closer to capacity, better utilizing resources.
3. Students will be able to graduate with the MSGA earlier than they would otherwise – and they will likely experience a cost-savings as well.
4. Students are more likely to be part of a full-time cohort, which is likely to translate into better retention and graduation rates.
5. An increasing number of students are completing all available GIS courses by their junior year: even if such students do not choose to continue into the MSGA, this option will give them the opportunity to take more geospatial coursework

1. Survey data indicate considerable interest in this accelerated program.
A survey of 75 students currently enrolled in all of the upper-level courses that contribute to the GIS Certificate was carried out from September 19-26, 2016. Duplicate names and those who had already applied to the MSGA were removed. 35 students responded, for a response rate of 46.7%. The survey included 19 seniors (57.6%), 13 juniors (39.4%) and one sophomore (3%); 80% of these students are formally signed up for the GIS Certificate. They derive from 11 different majors, with several double-majors for a total higher than 100%, as shown in the table below:

<table>
<thead>
<tr>
<th>Major</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry</td>
<td>1</td>
<td>2.86</td>
</tr>
<tr>
<td>Biology</td>
<td>4</td>
<td>11.43</td>
</tr>
<tr>
<td>Computer Science</td>
<td>1</td>
<td>2.86</td>
</tr>
<tr>
<td>Economics</td>
<td>1</td>
<td>2.86</td>
</tr>
<tr>
<td>Environmental Geology</td>
<td>1</td>
<td>2.86</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>2</td>
<td>5.71</td>
</tr>
<tr>
<td>Geography</td>
<td>20</td>
<td>57.14</td>
</tr>
<tr>
<td>Geology</td>
<td>2</td>
<td>5.71</td>
</tr>
<tr>
<td>Historic Preservation</td>
<td>4</td>
<td>11.43</td>
</tr>
<tr>
<td>International Affairs</td>
<td>1</td>
<td>2.86</td>
</tr>
<tr>
<td>Political Science</td>
<td>1</td>
<td>2.86</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>38</td>
<td>108.57</td>
</tr>
</tbody>
</table>

The survey was designed to assess interest in an accelerated or 5-year MSGA program. Three questions were asked, to see how interested these students were in any master’s program in GIS, their level of interest in taking courses applicable to both undergraduate and graduate programs, and their level of interest in this specific program if they were eligible to enroll. Results are shown below. Over 50% of students are extremely interested in completing a masters in GIS, with 74% expressing greatly increased

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1 GEOG 340B; GEOG/GISC 351; GISC 450; GISC 491; GISC 499
interest the MSGA if it combined graduate and undergraduate courses. Finally, almost 49% of surveyed students indicated that it was extremely likely that they would enroll in the MSGA if they qualified for the accelerated program proposed. We consider this a strong endorsement for the accelerated program.

Q1 - What is your level of interest in completing a master’s degree in geospatial analysis or GIS?

- Not interested at all: 2.86%
- Slightly interested: 14.29%
- Moderately interested: 31.43%
- Extremely interested: 51.43%

Q2 - If you could take classes that applied to both your undergraduate and graduate degree, how would this affect your interest in the MSGA program?

- No change in my interest: 2.86%
- Moderately increased interest: 22.86%
- Greatly increased interest: 74.29%

Q3 - If a 5-year Master of Science in Geospatial Analysis existed and you were eligible to enroll, how likely is it that you would enroll in the accelerated (5-year) MSGA program?

- Moderately unlikely: 2.86%
- Neither likely nor unlikely: 2.86%
- Slightly likely: 8.57%
- Moderately likely: 37.14%
- Extremely likely: 48.57%
2. Overall enrollment in the MSGA is likely to increase — especially full-time enrollment. Classes will be closer to capacity, better utilizing resources. The MSGA is in its third year. It is a program that requires prior experience in geographic information science (a minimum of two college courses and/or demonstrable experience). We have begun marketing to schools in Virginia that offer GIS but that do not have a master’s program (i.e. not GMU and VT) and to workplaces that utilize GIS. We are also promoting the program in general, attracting prospective students who sometimes need to take one or more undergraduate GIS courses before enrolling. Our enrollment numbers are still not where we would like them to be, and we would especially like to see more full-time enrollment. Classroom capacity is 18 students; we currently have 8-10 students per class. This accelerated program will offer opportunities to our students but will not require any new resources.

The following graph shows MSGA enrollment, with colored columns showing where students obtained their undergraduate degrees. The majority of students are from our own program, which is to be expected — but at the same time, the percentage has dropped off somewhat over time:

![MSGA enrollment by Undergraduate Institution](image)

3. Students in the accelerated program will be able to complete the MSGA degree at least 3 months earlier than would otherwise be possible if they attend full time. They are also expected to experience some cost savings over starting the MSGA after completing the undergraduate degree. The curriculum for the MSGA is six 4-credit courses plus a 6-credit capstone or research project. There are no electives and all six courses are offered every year, three per semester. There are no pre-requisites other than that 510 and 520 must be completed before capstone credits may be started. Students may start in the fall or spring semester.

Time to degree would be decreased for students taking classes in the senior year, though not enormously: the program is designed to be completed in 12 months by the motivated student attending full time and completing the capstone (6 credits) in summer. A student in the accelerated program would proceed as follows, completing the program one year after obtaining the bachelor’s degree:

<table>
<thead>
<tr>
<th>Students completing undergraduate degree in May:</th>
<th>MSGA awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Table showing the number of credits awarded in fall and spring each year]</td>
<td>[Table showing the number of credits awarded in fall and spring each year]</td>
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</tbody>
</table>

3 credits capstone
3 credits capstone
<table>
<thead>
<tr>
<th>Students completing undergraduate degree in December:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Fall</td>
</tr>
<tr>
<td>Apply</td>
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Financially, enrollment in an accelerated MSGA program would cost students less than completing the MSGA after the bachelor’s degree: while they would have to pay graduate tuition for the two courses completed prior to BA/BS/BLS, these credits would count toward the 120 required for graduation so would replace undergraduate credits. In addition, the students are more likely to complete in one 9-month period as full-time students and thus would not experience a rise in tuition during their program.

4. Students are more likely to be part of a full-time cohort, which is likely to translate into better retention and graduation rates.

The graph below shows enrollment by full-time or part-time status. We see an increasing trend toward part-time enrollment, probably because jobs are available. We predict that students are likely to continue full-time attendance if they go on directly after their undergraduate degree and know that they can graduate in one academic year. In addition, formation of stronger collegial ties seems likely to increase retention and graduation rates. While only two students have dropped out (one for a job, another for financial reasons) we want to avoid it.

![MSGA enrollment by Full-time/Part-time status](image)

6. An increasing number of undergraduate students are completing all available GIS courses by their junior year, because they start taking courses as first years or sophomores: even if such students do not choose to continue into the MSGA, this option will give them the opportunity to take more geospatial coursework.

Undergraduate students who excel in geographic information science are generally in the undergraduate GIS Certificate program, where they receive advising on internships, graduate programs and careers in geospatial technologies. So far, 71% of MSGA students with bachelor’s degrees from UMW also earned the certificate. The number of students earning the GIS Certificate has increased over time, as shown below. These students come from any major and most commonly complete the certificate (4 required courses plus a capstone, usually an internship) with their undergraduate degree. Others complete all the coursework but not the capstone. Anecdotally, students who begin the certificate in their freshman or sophomore years complete it and are looking for more classes in their junior or senior years. Having this accelerated program would allow them to take more classes even if they decided not to enter the MSGA.
Impact Statement

The accelerated MSGA program will not require any new resources, but will more fully utilize resources that are already available. By allowing undergraduate students to join already offered graduate students in the same classes, there is no change in use of physical resources (computer labs, software, and faculty) or the budget. Library resources might be more in demand, but electronic usage is typical in these graduate courses so we do not expect the library to feel any impact. The number of "open lab" hours in all computer labs will not be decreased by this program, although more students may be using the labs to complete work – so usage should increase. We see this as a good thing, as labs are rarely completely full during open hours.

Current Catalog:

Admission Requirements for the MSGA Program

- Earned bachelor's degree from a regionally accredited college or university
- Successful applicants typically have a GPA of 3.0 or higher from undergraduate course work. In addition, students are required to have successfully earned credits in at least two college-level GIS classes; in lieu of completed coursework, students can gain admission by providing documented evidence demonstrating they have worked with a GIS, such as ArcGIS, Grass, MapInfo, IDRISI, Intergraph – or the equivalent software – on a range of projects indicating competence in the topics typically covered in upper-level undergraduate GIS. Students may be considered for provisional admission without having previous GIS coursework or related work experience under the agreement that if they are admitted they must take GIS 200 and GISC 351 or GEOG 351 prior to beginning their graduate-level courses.
- Non-native English speakers will provide evidence of proficiency in English.

Required forms and documents:

- Completed application for admission. The application form is found online.
- Official transcripts of all undergraduate and graduate course work.
- A statement of purpose outlining career goals.
- Résumé, stating relevant work experience; applicants without completed coursework in GIS need to provide documented evidence demonstrating their proficiency with GIS.
- Two letters of recommendation (on the application forms provided). One should be from a person who can attest to the applicant's GIS or geospatial experience, if applicable.
- Demonstration of English competency if English is not your native language. Any of the following is acceptable:
  - Test of English as a Foreign Language (TOEFL) – a minimum score of 88 on the Internet based test or a 570 paper-based score. TOEFL website: toefl.org.
International English Language Test system (ELTS) a minimum score of 6.5 on the academic exam. See ELTS website.

Certification of completion of the ELS Language Centers (ELS) Intensive English Program by completing Level 112. See ELS website.

If applicable, the International Student Application Supplement found online should be completed.

Following an initial vetting of applications by University Admissions, an interdisciplinary committee consisting of full-time UMW faculty familiar with the geospatial field will evaluate submitted documents. This committee will determine if students without undergraduate coursework in GIS have sufficient knowledge to succeed in the program.

Students are admitted for the fall or spring semester. Application Due Dates:

- **Fall Admission**: June 1
- **Spring Admission**: October 1

**New Catalog Entry:**

Admission Requirements for the MSGA Program

**Undergraduate Admission**

Undergraduate students should apply for the MSGA Accelerated Degree Program in the second semester of their junior year (upon successful completion of 70 credits). Applications will be due on the Monday of the 6th week of that semester. Applicants should have a cumulative GPA of 2.7 or higher based on a minimum of 12 UMW credits, have completed at least two GIS courses each with a grade of B or higher, and supply a letter of recommendation from a UMW faculty member who teaches GIS. Once admitted, students will take MSGA 510 (Spatial Thinking) in the fall semester and MSGA 520 (GeoDesign and GeoVisualization) in the spring semester. These courses are not sequenced; MSGA 520 may be taken before MSGA 510.

On completion of the undergraduate degree, students may apply for formal admission to the graduate program, providing the forms and documents listed below. The two MSGA courses count toward the graduate program if formal admission to the MSGA program is received within five years of the award of the undergraduate degree.

**Continuance Requirements (Undergraduate)**

To continue in the program, students must achieve a grade of B (3.0) or better in each of the graduate courses and must maintain a cumulative GPA higher than 2.7.

**Graduate Admission**

As previously, no changes