Mathematics Program at University of Wisconsin Green Bay
Self-Study Report (2017 November)

Cover

Name of Program: Mathematics

Name of Program Chair: Woo Jeon

Date of Last Program Review: November 8, 2010

Date the Current Self-Study Report approved by Mathematics Executive Committee: November 30, 2017

Mathematics Executive Committee:
    Kathleen C. Burns (Associate Professor, Human Development)
    Heidi S. Fenc1 (Professor, Natural & Applied Sciences)
    Woo Jeon (Chair, Associate Professor, Natural & Applied Sciences)
Section A. Mission Statement and Program Description

State your program's mission, describe its requirements and explain how they relate to UW-Green Bay's select mission and the institution's overall strategic plan. Note any changes that have been made to your program mission and requirements since the last review. Then provide a description of your program's curricular strengths and areas in need of improvement.

The Mathematics Program at UWGB provides a problem-focused education using critical thinking and logic in Mathematics. The Program believes that the quality of life for students will be enriched through their education in Mathematics at UWGB. To make this possible, the Mathematics Program should provide students a quality education and it has been our mission to:

1. Provide majors and minors in Mathematics, with areas of emphasis in Mathematics and in Statistics respectively, which provide an appropriate practical and theoretical mathematical knowledge and quantitative skills for a student to effectively market his/her expertise within a chosen profession and/or preparing for graduate studies.
2. Provide an environment in which disciplinary and interdisciplinary mathematical scholarship can effectively and efficiently be carried out.
3. Provide a component of the General Education Program that clarifies the importance of mathematics in our society and enhances the general mathematical literacy of our students.
4. Provide supporting courses for all degree programs within Natural and Applied Sciences - Biology, Chemistry, Geoscience, Engineering, Environmental Science and Mathematics, and Physics. Provide supporting courses for the following undergraduate programs: Accounting, Business Administration, Economics, Education, Environmental Policy and Planning, Human Biology, Human Development, Information Sciences, Interdisciplinary Studies, Nursing, Political Science, Psychology, Public Administration, Social Change and Development, Social Work, Sociology, Urban and Regional Studies. Provide supporting courses for the following pre-professional programs of study: Dentistry, Engineering, Medicine, Nursing, Occupational Therapy, Pharmacy, Physical Therapy, and Veterinary Medicine.
5. Provide a component of the Environmental Science and Policy and the Applied Leadership for Teaching and Learning graduate programs.
6. Provide service to the University and local community in the form of remedial mathematics courses, consulting, workshops, etc.

The Mathematics Program offers two emphasis, Mathematics and Statistics, for its major and minor. The requirement for each major and minor are as follows:

Mathematics major with Mathematics emphasis – 45 credits
Mathematics major with Statistics emphasis – 47 credits
Mathematics minor with Mathematics emphasis – 24 credits
Mathematics minor with Statistics emphasis – 24 credits

These credits include courses ranging from MATH 202 Calculus I and MATH 260 Introductory Statistics up to MATH 492 Special Topics in Mathematics. All the degrees that the Program offers are disciplinary majors and minors.

The faculty body of the Mathematics Program consists of one full professor (Provost), one associate professor (in Algebra), four assistant professors (Applied Mathematics, Geometry/Topology, and two in Statistics), three lecturers, and three ad-hoc instructors.
Curricular Strengths
1. Our program does not require a lot of credits for its major. This means that students are able to achieve a (disciplinary) major in Mathematics with an interdisciplinary major or minor in 4 years. Typical interdisciplinary majors and minors for students who pursue a major in Mathematics are Education, Business Administration, and Environmental Science. Within 45 or 47 credits, our curriculum covers important courses for its core.
2. The Mathematics Program supports a breadth of majors. The core requirement includes the “big three”: Analysis, Algebra, and Geometry that reflect the current faculty members’ specialties. The Mathematics Program also provides enough supporting courses: Calculus sequence, Linear Algebra I & II, Proofs, Statistics, Differential Equations.
3. Several courses serve for UWGB General Education requirements: Quantitative Literacy (MATH 202, 203, 260), Capstone Experiences (MATH 385)

Areas in Need of Improvement
1. There are not many elective options. For example, there are 5 courses listed as electives for Mathematics major with Mathematics emphasis. One of these is a Statistics course, however, in order to take one Statistics course (MATH 361) you must take another Statistics course (MATH 36) for a prerequisite, so it is not useful as an elective option, as you would have to take both courses while the elective is a requirement of only one additional course. Two of the other elective Math courses have been cancelled many times due to low enrollment and the last course option is an independent study. Since all 4 tenured or tenure-track faculty except one (newly hired Mathematician) are teaching overloads (even junior faculty members), we need more resources to be able to offer more elective courses. Low enrolment issue can be solved by engaging the student group while promoting “Math and Sats Club” activities. Two junior faculty members will be co-advisors of (newly reborn) the “Math and Stats Club” and it was launched in November 2017.
2. The core courses in Algebra and Geometry are survey courses, which are not abstract enough. These courses can be “real” undergraduate Algebra and Geometry courses by increasing their credits from 3 to 4. This can be a first step for the Mathematics Program to make the Core courses for its majors stronger. Right now, it is not strong enough for students pursuing higher education in graduate level studies.
3. There are no active courses for Applied Mathematics even though we have an applied mathematician (T. Malysheva). The Mathematics Program plans to offer MATH 355 (new course) Applied Mathematical Optimization (3cr) starting Fall 2018.
4. None of the courses offered by the Mathematics Program satisfies the Writing Emphasis requirement for General Education. The Program has a plan to offer two (at least one) upper-level Writing Emphasis courses starting Spring 2018.

Section B. Student Learning Outcomes Assessment
Describe the program's intended student learning outcomes and the methods used to assess them. Analyze the assessment results and describe the conclusions drawn from that analysis. Finally, describe what specific actions were taken as a result of the assessment of student outcomes learning.

The following is a list of the program’s learning outcomes for students:
1. Mathematics majors will be able to understand the important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.
2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.
3. Mathematics majors will be able to apply knowledge derived from the major content areas of Calculus, Analysis, and Linear Algebra.
4. Mathematics majors will be able to pose mathematical/statistical problems and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.
5. Mathematics majors will be able to demonstrate their understanding of how mathematics/statistics is used in the solution of real-world problems.
6. Mathematics majors will be able to use technological aids appropriately in the study of mathematics/statistics and properly interpret and assess the computed results.

These outcomes have been assessed via combinations of quizzed, assignments, and exams for the following courses for last 4 academic years:

2016~2017  MATH 328, 385  Learning Outcomes 1, 2, 4
2015~2016  MATH 385  Learning Outcomes 1, 2, 4
2014~2015  MATH 385  Learning Outcomes 1, 2, 4
2013~2014  MATH 324  Learning Outcomes 1, 2, 4

Even though the results in each year are satisfactory in every aspects (see p41~46), the Program has a plan to
1. Assess other learning outcomes
2. Get data from various classes that include Statistics classes.
during the next Program Review cycle (2017~2024).

Section C. Program Accomplishments and Student Success

Describe your program's major accomplishments and student successes since the last Academic Program Review (e.g., internship program; enrollment increases; student achievements, awards, publications, and presentations; faculty scholarly activity, graduate school admission, diversification of students and faculty; program and faculty awards). Also describe faculty and staff professional development activities and how they impacted your program.

All the faculty members of the Mathematics Program have been active scholarly. Their recent publications include

- Michanowicz, D.R., Shmool, J.L.C., Cambal, L., Tunno, B., Gillooly, S., **Olson Hunt, M. J.**, *


And the following is a list of research presentations at professional conferences:


Ki-Bong Nam (invited speaker), Woo Jeon, Hyunsook Moon, Notes on Classification of Finite Simple Lie Algebras and Beyond, 2016 International Conference of the Honam Mathematical Society (June 16-18, 2016), hosted by Department of Mathematics Education at Chonbuk National University, Korea.

Woo Jeon (organizer and the main speaker) (Jun 15, 2015–August 14, 2015), The 5th Algebra Summer School, Korea National University of Education & Korea National University of Transportation.
Note that these work have been done by only the current faculty members in Mathematics.

The Mathematics Program has noticed the following for “Program Accomplishments and Student Success”:

1. Remedial Mathematics
   ① There was a new set score for the Mathematics Placement Test of UW System (WMPT) announced on October 26, 2016 by Jim Henderson, Vice President for Academic and Student Affairs. The new cut score was 470 (used to be 436/850) and students who score at least 470 on WMPT are guaranteed placement into credit-bearing math courses.
   ② As a result, contents of lower-level mathematics courses was re-categorized as remedial contents and non-remedial contents. Many non-remedial contents became remedial.
   ③ At the same time, UW System wanted to reduce the number of students who are placed into remedial mathematics.
   ④ Based on the new guideline and needs, the Mathematics Program made the new table for WMPT by creating new courses and modifying current courses:

<table>
<thead>
<tr>
<th>MFND</th>
<th>AALG</th>
<th>TAG</th>
<th>Course Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>150-415</td>
<td>150-850</td>
<td>150-850</td>
<td>MATH 094 (3cr); MATH 100 (3cr); COMM SCI 205 (4) + COMM SCI 097 (1)</td>
</tr>
<tr>
<td>416-465</td>
<td>150-850</td>
<td>150-850</td>
<td>MATH 099 (2cr); MATH 100 (3cr); COMM SCI 205 (4)</td>
</tr>
<tr>
<td>466-850</td>
<td>150-525</td>
<td>150-850</td>
<td>MATH 101 (2cr); MATH 104, MATH 201, MATH 260; BUS ADM 216; CHEM 211; ET 105</td>
</tr>
<tr>
<td></td>
<td>526-850</td>
<td>150-525</td>
<td>MATH 202; COMP SCI 240; Physics 103</td>
</tr>
</tbody>
</table>

Note that
i. MATH 094/099/101 sequence is mainly for STEM students.
ii. Humanities majors might prefer MATH 100 Math Appreciation.
iii. Social Science majors might prefer COMM SCI 205 Social Science Statistics.
These are successfully implemented starting Fall 2017.

2. Actuarial Science
The following new emphasis in Mathematics Minor has been designed and waiting for approvals:

1. Mathematics Minor with Actuarial Science Emphasis: 31~32 credits
   Take 28 credits
   MATH 202 Calculus and Analytic Geometry I (4cr)
   MATH 203 Calculus and Analytic Geometry II (4cr)
   MATH 209 Multivariate Calculus (4cr)
   MATH 260 Introductory Statistics (4cr)
   MATH 360 Theory of Probability (3cr)
   MATH 361 Mathematical Statistics (3cr)
   BUS ADM 343 Corporation Finance (3cr)
   BUS ADM 442 Principles of Investment (3cr)

   Select 1 courses from
   MATH 467 Applied Regression Analysis (4cr)
   ACCTG 300 Introductory Accounting (4cr)
3. There have been several changes on the status of faculty members and four positions were replaced: M. Olson Hunt, T. Malysheva, S. Amiri, and M. Nortfleet. These transitions have been successful. For example, T. Malysheva and M. Nortfleet helped the Mathematics Program to launch “Math & Stats Club” starting Fall 2017. However, the Mathematics Program still need one more replacement because the Program will need 19 credits of overloads and 28 Ad-hoc credits for 2017–2018 academic year. These credits do not include 28 credits for remedial mathematics.

4. Some Mathematics faculty members were nominated as UWGB Student-Nominated Teaching Award (T. Malysheva 2016, W. Jeon 2017), and M. Olson Hunt won the award in 2017.

Section D. Program Enrollment Trends and Analysis

Provide an analysis of the data (both survey and institutional enrollment data) provided by the Office of Institutional Research and Assessment. Pay close attention to the demographic information. What trends are present? Are there any imbalances in terms of gender, race, or ethnicity? Describe what specific actions, if any, were taken or are intended to be taken based on the conclusions drawn from the analysis.

1. The number of majors has been steady (45–62). However, the number of minors has been decreased from 26 (2010) to 13 (2013) and bounced back to 16 (2016). We notice that the Computer Science Program eliminated math courses from its curriculum around 2013, so the math minor was no longer attractive to students with Computer Science major.

2. Minority students who declared majors in Mathematics has been less than 10%. There have been only 0, 1, or 2 students of color graduated with majors in Mathematics. However, it is not very different from the state-wide and nation-wide trends.

Section E. Program's Vision for Future Development

Describe your program's plan for future development including the program's major goals for the next seven-year period. These goals should established with the understanding that they will be used to guide program planning and development and serve as a framework for your program's next Self-Study Report.

The following are future plans of the Mathematics Program:

1. The Mathematics Program wants to change its name to the “Mathematics and Statistics Program” because we additionally offer a Mathematics major and minor with Statistics emphasis. This change will help promote the program.

2. After the name change, we expect to develop stronger curriculums for both Mathematics and Statistics. For example, we want to add “History of Mathematics” and “Applied Mathematical Optimization” to the Mathematics emphasis curriculum.

3. The Mathematics Program will stay close to the newly re-launched “Math and Stats Club.” This will help with retention of student interest in Mathematics. We are hoping to see students who will pursue and be accepted into graduate programs in Mathematics.

4. As the Computer Science Program and School of Engineering are added to CST, the Mathematics Program will provide proper supports.

5. As described in Section C, we would like to launch the Actuarial Science minor starting Fall 2018. If it becomes successful, we will add the Actuarial Science emphasis to the Mathematics major later.

6. The Mathematics Program will develop multiple ways to place students into different levels in courses in Mathematics. This includes an early alert using ACT and/or EMPT scores.
The Mathematics Program will provide resources to make “Turbo Charge” successful.

The Mathematics Program will keep monitoring the trend of current remedial math courses and the first college credit bearing courses.

The Mathematics Program will have a better assessment plan for students’ learning outcomes.

Section F. Summary and Concluding Statement

Respond specifically to the results and recommendations from the last review and end your report with a general concluding statement.

The following are responses to the results and recommendations from the last review:

1. Last Reviews: p37 (AAC to Dean), p38 (Dean to Provost), p40 (Dean to Chair)
   The Mathematics Program is finishing a formal beginning of the Mathematics minor with Actuarial Science emphasis. This program will not require an additional resource. We expect to get approvals from the Mathematics Executive Committee, and NAS as well as the Business Program. This program will not help students who pursue a major in Mathematics because students are not allowed to have a major and a minor in a same discipline. This issue will be solved once we can offer a major in Actuarial Science. However, this will require at least one faculty position in Actuarial Science.

2. Last Reviews: p37 (AAC to Dean), p38 (Dean to Provost), p40 (Dean to Chair)
   Currently, the Mathematics center is not planned due to resource shortages.

3. Last Reviews: p37 (AAC to Dean), p39 (Dean to Chair)
   We started to offer MATH 094, 099, 100, and 101 online courses, and MATH 104 will be added in 2018. Hopefully, it will help to solve the large enrollments issue in these lower level courses.

4. Last Reviews: p39 (Dean to Chair)
   The number of majors in Mathematics has been steady: 53 in 2010 and 56 in 2016.

5. Last Reviews: p39 (Dean to Chair)
   The Mathematics Program support the curriculum and research associated with the environmental science component of the larger NAS unit. M. Olson Hunt and T. Malysheva teach courses in Environmental Science and ES&P.

The Mathematics Program at UWGB is a program with young faculty members. 4 of 5 faculty members were hired within 4 years: M. Olson Hunt (2014, Statistics), T. Malysheva (2015, Applied Mathematics), S. Amiri (2016, Statistics), M. Nortfleet (2017, Geometry/Topology). Using their energy and enthusiasm, we have been providing an excellent education in Mathematics and Statistics. We keep providing our strong contribution to UWGB and will transfer our expertise and enthusiasm in Mathematics and Statistics to our students.

Section G. Required Attachments

Four attachments (and only these four) should be included with the Self-Study Report:

1. A series of tables, prepared by the Office of Institutional Research and Assessment. A list of these tables is included in Appendix C.
### Fall Headcounts

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared Majors, end of term</td>
<td>53</td>
<td>62</td>
<td>58</td>
<td>53</td>
<td>45</td>
<td>45</td>
<td>56</td>
</tr>
<tr>
<td>Declared Minors, end of term</td>
<td>26</td>
<td>24</td>
<td>21</td>
<td>13</td>
<td>18</td>
<td>16</td>
<td>19</td>
</tr>
</tbody>
</table>

### Fall Declared Majors - Characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>27</td>
<td>51%</td>
<td>31</td>
<td>50%</td>
<td>30</td>
<td>52%</td>
<td>27</td>
</tr>
<tr>
<td>Minority</td>
<td>5</td>
<td>9%</td>
<td>5</td>
<td>8%</td>
<td>3</td>
<td>5%</td>
<td>5</td>
</tr>
<tr>
<td>Age 26 or older</td>
<td>5</td>
<td>9%</td>
<td>3</td>
<td>5%</td>
<td>3</td>
<td>5%</td>
<td>2</td>
</tr>
<tr>
<td>Location of HS: Brown County</td>
<td>14</td>
<td>26%</td>
<td>18</td>
<td>29%</td>
<td>18</td>
<td>31%</td>
<td>14</td>
</tr>
<tr>
<td>Location of HS: Wisconsin</td>
<td>51</td>
<td>96%</td>
<td>60</td>
<td>97%</td>
<td>54</td>
<td>93%</td>
<td>48</td>
</tr>
<tr>
<td>Attending Full Time</td>
<td>46</td>
<td>87%</td>
<td>57</td>
<td>92%</td>
<td>52</td>
<td>90%</td>
<td>48</td>
</tr>
<tr>
<td>Freshmen</td>
<td>6</td>
<td>11%</td>
<td>3</td>
<td>5%</td>
<td>1</td>
<td>2%</td>
<td>0</td>
</tr>
<tr>
<td>Sophomores</td>
<td>6</td>
<td>11%</td>
<td>11</td>
<td>18%</td>
<td>7</td>
<td>12%</td>
<td>10</td>
</tr>
<tr>
<td>Juniors</td>
<td>15</td>
<td>28%</td>
<td>19</td>
<td>31%</td>
<td>13</td>
<td>22%</td>
<td>12</td>
</tr>
<tr>
<td>Seniors</td>
<td>25</td>
<td>47%</td>
<td>28</td>
<td>45%</td>
<td>37</td>
<td>64%</td>
<td>31</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Average HS Cumulative G.P.A.</td>
<td>3.49</td>
<td>3.46</td>
<td>3.49</td>
<td>3.60</td>
<td>3.59</td>
<td>3.59</td>
<td>3.66</td>
</tr>
<tr>
<td>Average ACT Composite Score</td>
<td>23.7</td>
<td>24.2</td>
<td>24.8</td>
<td>25.0</td>
<td>25.0</td>
<td>25.7</td>
<td>25.7</td>
</tr>
<tr>
<td>Average ACT Reading Score</td>
<td>22.2</td>
<td>22.5</td>
<td>23.6</td>
<td>23.9</td>
<td>23.7</td>
<td>24.8</td>
<td>25.0</td>
</tr>
<tr>
<td>Average ACT English Score</td>
<td>22.8</td>
<td>23.4</td>
<td>23.9</td>
<td>24.3</td>
<td>24.2</td>
<td>24.6</td>
<td>24.7</td>
</tr>
<tr>
<td>Average ACT Math Score</td>
<td>26.0</td>
<td>26.9</td>
<td>27.3</td>
<td>26.9</td>
<td>26.9</td>
<td>27.6</td>
<td>27.5</td>
</tr>
<tr>
<td>Average ACT Science Score</td>
<td>23.9</td>
<td>24.3</td>
<td>24.7</td>
<td>25.2</td>
<td>25.3</td>
<td>25.9</td>
<td>25.8</td>
</tr>
<tr>
<td>Percent started as Freshmen</td>
<td>57%</td>
<td>52%</td>
<td>50%</td>
<td>51%</td>
<td>60%</td>
<td>69%</td>
<td>64%</td>
</tr>
<tr>
<td>Percent started as Transfers</td>
<td>43%</td>
<td>48%</td>
<td>50%</td>
<td>49%</td>
<td>40%</td>
<td>31%</td>
<td>36%</td>
</tr>
<tr>
<td>Percent with prior AA degree</td>
<td>8%</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
<td>7%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Percent with prior BA degree</td>
<td>4%</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calendar Year Headcounts</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduated Majors (May, Aug. &amp; Dec.)</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>19</td>
<td>16</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Graduated Minors (May, Aug. &amp; Dec.)</td>
<td>9</td>
<td>15</td>
<td>10</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>
### Characteristics of Graduated Majors

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates who are...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>55%</td>
<td>46%</td>
<td>60%</td>
<td>42%</td>
<td>38%</td>
<td>40%</td>
<td>55%</td>
</tr>
<tr>
<td>... Students of Color</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>8%</td>
<td>10%</td>
<td>5%</td>
<td>0%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>... Over 26 Years Old</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>36%</td>
<td>31%</td>
<td>20%</td>
<td>21%</td>
<td>44%</td>
<td>30%</td>
<td>9%</td>
</tr>
<tr>
<td>Graduates earning...</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Degree Honors</td>
<td>55%</td>
<td>46%</td>
<td>40%</td>
<td>53%</td>
<td>38%</td>
<td>50%</td>
<td>55%</td>
</tr>
</tbody>
</table>

### Average Credits Completed

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Credits Completed Anywhere</td>
<td>156</td>
<td>142</td>
<td>148</td>
<td>154</td>
<td>162</td>
<td>143</td>
<td>150</td>
</tr>
<tr>
<td>Average Credits Completed at UWGB</td>
<td>121</td>
<td>125</td>
<td>125</td>
<td>119</td>
<td>118</td>
<td>110</td>
<td>106</td>
</tr>
<tr>
<td>Average Cum GPA for Graduates</td>
<td>3.53</td>
<td>3.20</td>
<td>3.36</td>
<td>3.45</td>
<td>3.41</td>
<td>3.49</td>
<td>3.44</td>
</tr>
</tbody>
</table>

### Headcount Enrollments, Credit-bearing Activities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Lower</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Spring</td>
<td>718</td>
<td>686</td>
<td>692</td>
<td>705</td>
<td>646</td>
<td>658</td>
<td>723</td>
</tr>
<tr>
<td>2-Summer</td>
<td>157</td>
<td>118</td>
<td>110</td>
<td>109</td>
<td>114</td>
<td>114</td>
<td>142</td>
</tr>
<tr>
<td>3-Fall</td>
<td>1032</td>
<td>906</td>
<td>891</td>
<td>867</td>
<td>862</td>
<td>884</td>
<td>829</td>
</tr>
<tr>
<td>All</td>
<td>1907</td>
<td>1710</td>
<td>1693</td>
<td>1681</td>
<td>1622</td>
<td>1656</td>
<td>1694</td>
</tr>
<tr>
<td>2-Upper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Spring</td>
<td>133</td>
<td>134</td>
<td>132</td>
<td>124</td>
<td>77</td>
<td>94</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Headcount Enrollments, Credit-bearing Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>2-Summer</strong></td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>3-Fall</strong></td>
<td>100</td>
<td>86</td>
<td>104</td>
<td>64</td>
<td>76</td>
<td>72</td>
<td>77</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>233</td>
<td>220</td>
<td>236</td>
<td>188</td>
<td>153</td>
<td>166</td>
<td>173</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>2140</td>
<td>1930</td>
<td>1929</td>
<td>1869</td>
<td>1775</td>
<td>1822</td>
<td>1867</td>
</tr>
<tr>
<td>IST/FEX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1-Lower</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1-Spring</strong></td>
<td>.</td>
<td>.</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>2-Summer</strong></td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>3-Fall</strong></td>
<td>.</td>
<td>1</td>
<td>.</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>2-Upper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1-Spring</strong></td>
<td>3</td>
<td>13</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>.</td>
</tr>
<tr>
<td><strong>2-Summer</strong></td>
<td>.</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>1</td>
</tr>
<tr>
<td><strong>3-Fall</strong></td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>5</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>5</td>
<td>16</td>
<td>11</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>2145</td>
<td>1946</td>
<td>1940</td>
<td>1875</td>
<td>1778</td>
<td>1826</td>
<td>1869</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Student Credit Hours, Credit-bearing Activities</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lectures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1-Lower</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1-Spring</strong></td>
<td>2562</td>
<td>2445</td>
<td>2495</td>
<td>2584</td>
<td>2373</td>
<td>2441</td>
<td>2655</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td><strong>IST/FEX</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1-Lower</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Spring</td>
<td>.</td>
<td>.</td>
<td>3</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>2-Summer</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>3-Fall</td>
<td>.</td>
<td>1</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>All</td>
<td>.</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>2-Upper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Spring</td>
<td>10</td>
<td>35</td>
<td>9</td>
<td>10</td>
<td>6</td>
<td>9</td>
<td>.</td>
</tr>
<tr>
<td>2-Summer</td>
<td>.</td>
<td>3</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>3</td>
</tr>
<tr>
<td>3-Fall</td>
<td>7</td>
<td>3</td>
<td>19</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>All</td>
<td>17</td>
<td>41</td>
<td>28</td>
<td>16</td>
<td>10</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>17</td>
<td>42</td>
<td>31</td>
<td>17</td>
<td>10</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

**Student Credit Hours, Credit-bearing Activities**


**IST/FEX**
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2-Summer</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-Fall</td>
<td>24</td>
<td>26</td>
<td>27</td>
<td>27</td>
<td>28</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>48</td>
<td>51</td>
<td>57</td>
<td>59</td>
<td>59</td>
<td>57</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>2-Summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Fall</td>
<td></td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>60</td>
<td>64</td>
<td>70</td>
<td>70</td>
<td>70</td>
<td>69</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>1-Spring</td>
<td>2-Summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td>5</td>
<td>7</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Lectures and Lab/Discussion Sections (#)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>65</td>
<td>71</td>
<td>72</td>
<td>72</td>
<td>70</td>
<td>69</td>
<td>65</td>
</tr>
</tbody>
</table>

### Average Section Size of Lectures

<table>
<thead>
<tr>
<th>Lectures</th>
<th>1-Lower</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-Spring</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Upper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-Spring</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Unique Lecture Courses Delivered in Past Four Years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Lower</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>2-Upper</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>14</td>
</tr>
</tbody>
</table>
### General Education as a Percent of all Credits in Lectures

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Lower</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>22%</td>
<td>45%</td>
<td>43%</td>
</tr>
<tr>
<td>2-Upper</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Instructional Staff Headcounts and FTEs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Professors (FT)</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Associate Professors (FT)</td>
<td>15</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>10</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Assistant Professors (FT)</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Instructors and Lecturers (FT)</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Total Full-time Instructional Staff</td>
<td>30</td>
<td>29</td>
<td>29</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>Part-time Instructional Staff</td>
<td>18</td>
<td>16</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>FTE of Part-time Faculty</td>
<td>6.8</td>
<td>3.2</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Total Instructional FTE</td>
<td>36.8</td>
<td>32.2</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

### Student Credit Hours per Faculty FTE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SCH per Full-time Faculty FTE</td>
<td>406</td>
<td>358</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>SCH per Part-time Faculty FTE</td>
<td>137</td>
<td>587</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>SCH per Faculty FTE</td>
<td>356</td>
<td>378</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
Graduating Senior Survey:  

<table>
<thead>
<tr>
<th>Graduation Year</th>
<th>Mathematics</th>
<th>UWGB Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>10</td>
<td>1293</td>
</tr>
<tr>
<td>2013</td>
<td>17</td>
<td>1229</td>
</tr>
<tr>
<td>2014</td>
<td>14</td>
<td>1233</td>
</tr>
<tr>
<td>2015</td>
<td>9</td>
<td>1260</td>
</tr>
<tr>
<td>2016</td>
<td>11</td>
<td>1250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graduates:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2016</td>
</tr>
<tr>
<td>2012-2016</td>
</tr>
</tbody>
</table>

* Note: % response misses double-majors who choose to report on their other major.

Table 1: Rating the MAJOR  
(A = 4, B = 3.0, etc.)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012-2016</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>mean</td>
</tr>
<tr>
<td>Clarity of major requirements</td>
<td>MATH</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2809</td>
</tr>
<tr>
<td>Reasonableness of major requirements</td>
<td>MATH</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2803</td>
</tr>
<tr>
<td>Variety of courses available in your major</td>
<td>MATH</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2797</td>
</tr>
<tr>
<td>Frequency of course offerings in your major</td>
<td>MATH</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2789</td>
</tr>
<tr>
<td>Times courses were offered</td>
<td>MATH</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2744</td>
</tr>
<tr>
<td>Quality of internship, practicum, or field experience</td>
<td>MATH</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>1630</td>
</tr>
<tr>
<td>Quality of teaching by faculty in your major</td>
<td>MATH</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2797</td>
</tr>
<tr>
<td>Knowledge and expertise of the faculty</td>
<td>MATH</td>
<td>31</td>
</tr>
<tr>
<td>Table 1: Rating the MAJOR</td>
<td>Unit of Analysis</td>
<td>2012-2016</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>mean</td>
</tr>
<tr>
<td>in your major</td>
<td>UWGB</td>
<td>2807</td>
</tr>
<tr>
<td>Faculty encouragement of your educational goals</td>
<td>MATH</td>
<td>31</td>
</tr>
<tr>
<td>Overall quality of advising received from the faculty in your major</td>
<td>MATH</td>
<td>26</td>
</tr>
<tr>
<td>Availability of your major advisor for advising</td>
<td>MATH</td>
<td>29</td>
</tr>
<tr>
<td>Ability of your advisor to answer university questions</td>
<td>MATH</td>
<td>26</td>
</tr>
<tr>
<td>Ability of your advisor to answer career questions</td>
<td>MATH</td>
<td>25</td>
</tr>
<tr>
<td>In-class faculty-student interaction</td>
<td>MATH</td>
<td>31</td>
</tr>
<tr>
<td>Overall grade for your major (not an average of the above)</td>
<td>MATH</td>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2. Job related to major while completing degree?</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paid</td>
<td>Non-paid</td>
</tr>
<tr>
<td>2012-2016 percent</td>
<td>MATH</td>
<td>31</td>
<td>3%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2803</td>
<td>16%</td>
<td>1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3. “If you could start college over”</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>UW-Green Bay</th>
<th>Another college</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Same major</td>
<td>Different major</td>
</tr>
<tr>
<td>2012-2016 percent</td>
<td>MATH</td>
<td>30</td>
<td>70%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2801</td>
<td>68%</td>
<td>13%</td>
</tr>
</tbody>
</table>
Table 4. Plans regarding graduate/professional study

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>n</th>
<th>Already admitted</th>
<th>Have applied</th>
<th>Plan to eventually attend</th>
<th>NA/have not applied yet</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>21</td>
<td>9%</td>
<td>5%</td>
<td>57%</td>
<td>29%</td>
</tr>
<tr>
<td>UWGB</td>
<td>2123</td>
<td>9%</td>
<td>10%</td>
<td>60%</td>
<td>21%</td>
</tr>
</tbody>
</table>

Table 5. Highest degree planned

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>n</th>
<th>Bachelor’s</th>
<th>Master’s</th>
<th>Specialist’s</th>
<th>Professional</th>
<th>Doctoral</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>31</td>
<td>45%</td>
<td>32%</td>
<td>3%</td>
<td>3%</td>
<td>16%</td>
</tr>
<tr>
<td>UWGB</td>
<td>2803</td>
<td>36%</td>
<td>46%</td>
<td>1%</td>
<td>4%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Table 6. General Education preparation

<table>
<thead>
<tr>
<th>Critical analysis skills.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>30</td>
<td>70%</td>
<td>2.7</td>
<td></td>
<td>29</td>
<td>31%</td>
<td>2.2</td>
</tr>
<tr>
<td>UWGB</td>
<td>2675</td>
<td>63%</td>
<td>2.6</td>
<td>2594</td>
<td>41%</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem-solving skills.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>29</td>
<td>86%</td>
<td>2.9</td>
<td></td>
<td>28</td>
<td>39%</td>
<td>2.2</td>
</tr>
<tr>
<td>UWGB</td>
<td>2674</td>
<td>70%</td>
<td>2.7</td>
<td>2585</td>
<td>43%</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding biology and the physical sciences.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>27</td>
<td>7%</td>
<td>2.0</td>
<td></td>
<td>25</td>
<td>8%</td>
<td>1.9</td>
</tr>
<tr>
<td>UWGB</td>
<td>2535</td>
<td>29%</td>
<td>2.0</td>
<td>2438</td>
<td>27%</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding the impact of science and technology.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>29</td>
<td>52%</td>
<td>2.5</td>
<td></td>
<td>28</td>
<td>36%</td>
<td>2.2</td>
</tr>
<tr>
<td>UWGB</td>
<td>2564</td>
<td>37%</td>
<td>2.2</td>
<td>2473</td>
<td>30%</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding social, political, geographic, and economic structures.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>28</td>
<td>18%</td>
<td>2.1</td>
<td></td>
<td>28</td>
<td>25%</td>
<td>2.0</td>
</tr>
<tr>
<td>UWGB</td>
<td>2603</td>
<td>34%</td>
<td>2.2</td>
<td>2537</td>
<td>33%</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding the impact of social institutions and values.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>28</td>
<td>43%</td>
<td>2.3</td>
<td></td>
<td>27</td>
<td>26%</td>
<td>2.0</td>
</tr>
<tr>
<td>UWGB</td>
<td>2613</td>
<td>49%</td>
<td>2.4</td>
<td>2542</td>
<td>42%</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding the significance of major events in Western civilization.</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>29</td>
<td>17%</td>
<td>2.0</td>
<td></td>
<td>26</td>
<td>19%</td>
<td>2.0</td>
</tr>
<tr>
<td>UWGB</td>
<td>2572</td>
<td>33%</td>
<td>2.1</td>
<td>2494</td>
<td>34%</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding the role of the humanities in</th>
<th>Unit of Analysis</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
<th>n</th>
<th>% High</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>27</td>
<td>26%</td>
<td>2.2</td>
<td></td>
<td>26</td>
<td>23%</td>
<td>2.0</td>
</tr>
</tbody>
</table>
### Table 6. General Education preparation

<table>
<thead>
<tr>
<th>Current proficiency vs. Contribution of Gen Ed to current proficiency</th>
<th>Unit of Analysis</th>
<th>Current Proficiency</th>
<th>Gen Ed Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>% High</td>
<td>mean</td>
</tr>
<tr>
<td>identifying and clarifying values.</td>
<td>UWGB</td>
<td>2609</td>
<td>40%</td>
</tr>
<tr>
<td>Understanding at least one Fine Art.</td>
<td>MATH</td>
<td>26</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2565</td>
<td>39%</td>
</tr>
<tr>
<td>Understanding contemporary global issues.</td>
<td>MATH</td>
<td>27</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2585</td>
<td>34%</td>
</tr>
<tr>
<td>Understanding the causes and effects of stereotyping and racism.</td>
<td>MATH</td>
<td>28</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2616</td>
<td>60%</td>
</tr>
<tr>
<td>Written communication skills</td>
<td>MATH</td>
<td>28</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2644</td>
<td>66%</td>
</tr>
<tr>
<td>Public speaking and presentation skills</td>
<td>MATH</td>
<td>28</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2601</td>
<td>45%</td>
</tr>
<tr>
<td>Computer skills</td>
<td>MATH</td>
<td>29</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>2621</td>
<td>53%</td>
</tr>
</tbody>
</table>

### Table 7. Educational experiences

(5 pt. scale; 5 = strongly agree)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Because of my educational experiences at UW-Green Bay, I have learned to view learning as a lifelong process.</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>While at UW-Green Bay, I had frequent interactions with people from different countries or cultural backgrounds than my own.</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>The UW-Green Bay educational experience encourages students to become involved in community affairs.</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>My experiences at UW-Green Bay encouraged me to think creatively and innovatively.</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
</tbody>
</table>
Table 7. Educational experiences
(5 pt. scale; 5 = strongly agree)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012-2016</th>
<th>Strongly Agree or Agree</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My education at UW-Green Bay has given me a “competitive edge” over graduates from other institutions.</td>
<td>MATH 27</td>
<td>48%</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>UWGB 2588</td>
<td>66%</td>
<td>3.8</td>
</tr>
<tr>
<td>UW-Green Bay provides a strong, interdisciplinary, problem-focused education.</td>
<td>MATH 28</td>
<td>64%</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>UWGB 2660</td>
<td>75%</td>
<td>4.0</td>
</tr>
<tr>
<td>Students at UW-Green Bay have many opportunities in their classes to apply their learning to real situations.</td>
<td>MATH 29</td>
<td>41%</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>UWGB 2681</td>
<td>73%</td>
<td>3.9</td>
</tr>
<tr>
<td>I would recommend UW-Green Bay to a friend, co-worker, or family member.</td>
<td>MATH 29</td>
<td>72%</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>UWGB 2698</td>
<td>82%</td>
<td>4.2</td>
</tr>
<tr>
<td>There is a strong commitment to racial harmony on this campus.</td>
<td>MATH 27</td>
<td>70%</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>UWGB 2404</td>
<td>60%</td>
<td>3.7</td>
</tr>
<tr>
<td>The faculty and staff of UWGB are committed to gender equity.</td>
<td>MATH 28</td>
<td>79%</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>UWGB 2495</td>
<td>78%</td>
<td>4.1</td>
</tr>
<tr>
<td>This institution shows concern for students as individuals.</td>
<td>MATH 29</td>
<td>76%</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>UWGB 2641</td>
<td>75%</td>
<td>4.0</td>
</tr>
<tr>
<td>The General Education requirements at UWGB were a valuable component of my education.</td>
<td>MATH 29</td>
<td>41%</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>UWGB 2554</td>
<td>53%</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Table 8. Activities while at UW-Green Bay

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012-2016</th>
<th>Independent</th>
<th>Student org</th>
<th>Internship</th>
<th>Professional</th>
<th>Community</th>
<th>Worked with a faculty member</th>
<th>Study group</th>
<th>Study abroad</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>42%</td>
<td>65%</td>
<td>58%</td>
<td>16%</td>
<td>65%</td>
<td>26%</td>
<td>68%</td>
<td>13%</td>
</tr>
<tr>
<td>2012-2016 percent</td>
<td>MATH 31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2802</td>
<td>25%</td>
<td>49%</td>
<td>58%</td>
<td>24%</td>
<td>61%</td>
<td>24%</td>
<td>59%</td>
<td>15%</td>
</tr>
<tr>
<td>Unit of Analysis</td>
<td>2012-2016</td>
<td>Unit of Analysis</td>
<td>2012-2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------</td>
<td>------------------------------------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>A or B</td>
<td>mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library services (hours, staff, facilities)</td>
<td>MATH 26</td>
<td>85%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2295</td>
<td>91%</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library collection (books, online databases)</td>
<td>MATH 21</td>
<td>90%</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2190</td>
<td>93%</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admissions Office</td>
<td>MATH 25</td>
<td>92%</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2111</td>
<td>91%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Aid Office</td>
<td>MATH 24</td>
<td>88%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2010</td>
<td>87%</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bursar’s Office</td>
<td>MATH 31</td>
<td>87%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2470</td>
<td>87%</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Services</td>
<td>MATH 20</td>
<td>90%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 1528</td>
<td>86%</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Advising Office</td>
<td>MATH 29</td>
<td>66%</td>
<td>3.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2248</td>
<td>78%</td>
<td>3.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Health Services</td>
<td>MATH 18</td>
<td>94%</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 1247</td>
<td>87%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registrar’s Office</td>
<td>MATH 27</td>
<td>93%</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2095</td>
<td>90%</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing Center</td>
<td>MATH 8</td>
<td>100%</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 940</td>
<td>85%</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Union</td>
<td>MATH 30</td>
<td>90%</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 2195</td>
<td>87%</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Life</td>
<td>MATH 19</td>
<td>84%</td>
<td>3.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UWGB 1336</td>
<td>83%</td>
<td>3.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counseling Center</td>
<td>MATH 5</td>
<td>100%</td>
<td>3.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9. Rating services and resources

(A = 4, B = 3, etc.)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>UWGB</td>
<td></td>
</tr>
<tr>
<td>Computer Facilities (labs, hardware, software)</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>Computer Services (hours, staff, training)</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>Kress Events Center</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>Dining Services</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>American Intercultural Center</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>International Office</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>Residence Life</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
<tr>
<td>Bookstore</td>
<td>MATH</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Survey year</th>
<th>Graduation Year</th>
<th>Mathematics</th>
<th>UWGB Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>2008-2009</td>
<td>17</td>
<td>1133</td>
</tr>
<tr>
<td>2013</td>
<td>2009-2010</td>
<td>18</td>
<td>1295</td>
</tr>
<tr>
<td>2014</td>
<td>2010-2011</td>
<td>10</td>
<td>1309</td>
</tr>
<tr>
<td>2015</td>
<td>2011-2012</td>
<td>9</td>
<td>1233</td>
</tr>
<tr>
<td>2016</td>
<td>2012-2013</td>
<td>19</td>
<td>1305</td>
</tr>
</tbody>
</table>

Response Rate*: 2012-2016

|             | 8/73 (11%) | 901/6275 (14%) |

* Note: % response misses double-majors who chose to report on their other major.
<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012-2016</th>
<th>Preparation</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Excellent or Good</td>
<td>Mean</td>
</tr>
<tr>
<td>Critical analysis skills.</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>636</td>
<td>57%</td>
</tr>
<tr>
<td>Problem-solving skills.</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>635</td>
<td>58%</td>
</tr>
<tr>
<td>Understanding biology and the physical sciences.</td>
<td>MATH</td>
<td>5</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>610</td>
<td>47%</td>
</tr>
<tr>
<td>Understanding the impact of science and technology.</td>
<td>MATH</td>
<td>5</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>613</td>
<td>49%</td>
</tr>
<tr>
<td>Understanding social, political, geographic, and economic structures.</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>622</td>
<td>53%</td>
</tr>
<tr>
<td>Understanding the impact of social institutions and values.</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>630</td>
<td>59%</td>
</tr>
<tr>
<td>Understanding the significance of major events in Western civilization.</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>617</td>
<td>49%</td>
</tr>
<tr>
<td>Understanding a range of literature.</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>608</td>
<td>47%</td>
</tr>
<tr>
<td>Understanding the role of the humanities in identifying and clarifying individual and social values.</td>
<td>MATH</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>614</td>
<td>51%</td>
</tr>
<tr>
<td>Understanding at least one Fine Art, including its nature and function(s).</td>
<td>MATH</td>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>610</td>
<td>51%</td>
</tr>
<tr>
<td>Understanding contemporary global issues.</td>
<td>MATH</td>
<td>5</td>
<td>40%</td>
</tr>
</tbody>
</table>
### Table 1. Preparation & Importance

- Preparation by UWGB (5-pt. scale; 5 = excellent)
- Importance to current job or graduate program (5-pt. scale; 5 = very important)

| Unit of Analysis | 2012-2016 | Preparation | | Importance |
|------------------|-----------|-------------|-------------------|
|                  | n | Excellent or Good | Mean | n | Very Important or Important | Mean |
| UWGB             | 626 | 48% | 3.4 | 611 | 48% | 3.4 |
| Understanding the causes and effects of stereotyping and racism. | MATH | 5 | 40% | 3.6 | 5 | 40% | 3.4 |
| UWGB             | 623 | 53% | 3.6 | 609 | 53% | 3.5 |
| Written communication skills. | MATH | 5 | 40% | 3.4 | 5 | 60% | 3.8 |
| UWGB             | 630 | 65% | 3.8 | 618 | 76% | 4.2 |
| Public speaking and presentation skills. | MATH | 5 | 40% | 3.2 | 5 | 60% | 4.0 |
| UWGB             | 629 | 54% | 3.5 | 620 | 69% | 4.0 |
| Reading skills.  | MATH | 5 | 60% | 3.8 | 5 | 60% | 3.6 |
| UWGB             | 629 | 60% | 3.7 | 620 | 74% | 4.1 |
| Listening skills. | MATH | 5 | 40% | 3.6 | 5 | 60% | 3.6 |
| UWGB             | 630 | 63% | 3.7 | 620 | 77% | 4.2 |
| Leadership and management skills. | MATH | 5 | 40% | 3.4 | 5 | 60% | 3.6 |
| UWGB             | 634 | 58% | 3.6 | 621 | 76% | 4.1 |

### Table 2. Educational experiences

(5-pt. scale; 5 = strongly agree)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>N</th>
<th>Strongly Agree or Agree</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>My educational experiences at UW-Green Bay helped me to learn or reinforced my belief that learning is a lifelong process.</td>
<td>MATH</td>
<td>8</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>894</td>
<td>91%</td>
</tr>
<tr>
<td>While at UW-Green Bay, I had frequent interactions with people from different countries or cultural backgrounds than my own.</td>
<td>MATH</td>
<td>8</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>877</td>
<td>52%</td>
</tr>
</tbody>
</table>
### Table 2. Educational experiences

(5-pt. scale; 5 = strongly agree)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>N</th>
<th>Strongly Agree or Agree</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>8</td>
<td>75%</td>
<td>3.6</td>
</tr>
<tr>
<td>UWGB</td>
<td>878</td>
<td>60%</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My experiences and course work at UW-Green Bay encouraged me to think creatively and innovatively.</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>892</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The interdisciplinary, problem-focused education provided by UW-Green Bay gives its graduates an advantage when they are seeking employment or applying to graduate school.</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>884</td>
<td>77%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UW-Green Bay provides a strong, interdisciplinary, problem-focused education.</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>889</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students at UW-Green Bay have many opportunities in their classes to apply their learning to real situations.</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>889</td>
<td>73%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would recommend UW-Green Bay to co-worker, friend, or family member.</td>
<td>MATH</td>
<td>8</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>892</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The General Education requirements at UWGB were a valuable component of my education.</td>
<td>MATH</td>
<td>8</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>848</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UWGB cares about its graduates.</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>853</td>
<td>65%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel connected to UWGB.</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>879</td>
<td>48%</td>
</tr>
</tbody>
</table>

### Table 3. “If you could start college over”

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>n</th>
<th>UW-Green Bay</th>
<th>Another college</th>
<th>No bachelor’s degree anywhere</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Same major</td>
<td>Different major</td>
<td>Same major</td>
</tr>
<tr>
<td>2012–2016 percent</td>
<td>MATH</td>
<td>8</td>
<td>63%</td>
<td>13%</td>
</tr>
</tbody>
</table>
### Table 4. Rating the MAJOR

(Scale: A = 4, B = 3, etc.)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>2012–2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Quality of teaching.</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 898</td>
</tr>
<tr>
<td>Knowledge and expertise of the faculty.</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 897</td>
</tr>
<tr>
<td>Faculty-student relationships (e.g., helpfulness, sensitivity, acceptance of different views).</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 895</td>
</tr>
<tr>
<td>Importance and relevance of courses to professional and academic goals.</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 892</td>
</tr>
<tr>
<td>Advising by faculty (e.g., accuracy of information).</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 876</td>
</tr>
<tr>
<td>Availability of faculty (e.g., during office hours).</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 873</td>
</tr>
<tr>
<td>Overall grade for the major (not a sum of the above).</td>
<td>MATH 8</td>
</tr>
<tr>
<td></td>
<td>UWGB 892</td>
</tr>
</tbody>
</table>

### Table 5. Highest degree planned

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>n</th>
<th>Bachelor’s</th>
<th>Master’s</th>
<th>Specialist</th>
<th>Professional</th>
<th>Doctoral</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>8</td>
<td>75%</td>
<td>25%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UWGB</td>
<td>889</td>
<td>39%</td>
<td>45%</td>
<td>1%</td>
<td>3%</td>
<td>12%</td>
</tr>
</tbody>
</table>
### Table 6. Graduate/professional study plans

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>n</th>
<th>Already graduated</th>
<th>Currently enrolled</th>
<th>Accepted, not enrolled</th>
<th>Rejected</th>
<th>Have not applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2016 percent</td>
<td>MATH</td>
<td>3</td>
<td>33%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>554</td>
<td>25%</td>
<td>22%</td>
<td>3%</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Table 7. Current employment status

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>MATH (n = 8)</th>
<th>UWGB (n = 892)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed full-time (33 or more hours/week)</td>
<td>100%</td>
<td>79%</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>0</td>
<td>11%</td>
</tr>
<tr>
<td>Unemployed, seeking work</td>
<td>0</td>
<td>4%</td>
</tr>
<tr>
<td>Unemployed, not seeking work</td>
<td>0</td>
<td>2%</td>
</tr>
<tr>
<td>Student, not seeking work</td>
<td>0</td>
<td>4%</td>
</tr>
</tbody>
</table>

### Table 8. Satisfaction with current job (5-pt. scale; 5 = very satisfied)

<table>
<thead>
<tr>
<th>Unit of Analysis</th>
<th>n</th>
<th>Very satisfied or satisfied</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2016 percentage</td>
<td>MATH</td>
<td>8</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>UWGB</td>
<td>797</td>
<td>77%</td>
</tr>
</tbody>
</table>

### Table 9. Minimum educational requirements for current job

<table>
<thead>
<tr>
<th></th>
<th>MATH (n = 8)</th>
<th>UWGB (n = 772)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school or less</td>
<td>25%</td>
<td>17%</td>
</tr>
<tr>
<td>Certificate</td>
<td>0</td>
<td>2%</td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>63%</td>
<td>59%</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>0</td>
<td>9%</td>
</tr>
</tbody>
</table>
### Table 10. Extent to which job relates to major

<table>
<thead>
<tr>
<th></th>
<th>MATH (n = 8)</th>
<th>UWGB (n = 790)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very related</td>
<td>38%</td>
<td>50%</td>
</tr>
<tr>
<td>Somewhat related</td>
<td>37%</td>
<td>32%</td>
</tr>
<tr>
<td>Not at all related</td>
<td>25%</td>
<td>18%</td>
</tr>
</tbody>
</table>

### Table 11. Current income

<table>
<thead>
<tr>
<th></th>
<th>MATH (n = 7)</th>
<th>UWGB (n = 765)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $20,000</td>
<td>0</td>
<td>11%</td>
</tr>
<tr>
<td>$20,000 to $25,999</td>
<td>0</td>
<td>9%</td>
</tr>
<tr>
<td>$26,000 to $29,999</td>
<td>14%</td>
<td>9%</td>
</tr>
<tr>
<td>$30,000 to $35,999</td>
<td>0</td>
<td>15%</td>
</tr>
<tr>
<td>$36,000 to $39,999</td>
<td>29%</td>
<td>12%</td>
</tr>
<tr>
<td>$40,000 to $49,999</td>
<td>29%</td>
<td>18%</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>28%</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Employers, Locations, and Job Titles**

- Northeast Wisconsin Technical College, Green Bay, Wisconsin: Computer Support Help Desk Specialist
- SECURA Insurance, Appleton, Wisconsin: Actuarial Analyst
- Homes for Independent Living, Green Bay, Wisconsin: Business Analyst
- Aon Risk Solutions, Green Bay, Wisconsin: Account Specialist II
- Stephenson National Bank & Trust, Marinette, Wisconsin: Loan Processor
- JT Engineering, Madison, WI: Project Engineer
2. The program's current official description and requirements as published in the most recent Undergraduate Catalog;

Mathematics

http://www.uwgb.edu/nas/
Disciplinary Major or Minor
(Bachelor of Science)

The Mathematics discipline has programs of study in two emphasis areas: mathematics and statistics. A student who elects a disciplinary major in Mathematics must choose an area of emphasis from one of these two programs of study.

Students choosing the emphasis in mathematics will focus their studies in a discipline which has been an important part of our intellectual heritage for centuries. Students select this area of emphasis if they are interested in mathematics for its own sake (pure mathematics) or as a tool for analyzing and solving real-world problems (applied mathematics). Graduates may use their skills in many careers, including fields such as secondary education and engineering. Other typical areas of employment traditional for mathematicians are those requiring physics. Today, mathematical techniques are required in social, industrial, and management realms as well.

The emphasis in statistics provides applied courses in experimental design, multivariate statistical analysis, and applied regression analysis. Students also gain an extensive background in statistical computing. Students who wish to enter actuarial professions may prepare for the first two actuarial examinations by completing the calculus sequence, linear algebra sequence, and statistical theory sequence. Students who concentrate studies in statistics may find employment in business, industry, and government, as well as pursue further professional training in graduate school.

Program Entrance Requirements

The University of Wisconsin System placement examination in mathematics is used to advise entering freshmen about the level at which they should enter university courses. In rare cases, a student who has been accelerated and has mastery of calculus may, with advice of faculty, enter MATH 203 Calculus and Analytic Geometry II. Upon earning a “C” or better in MATH 203, an additional four credits are granted for MATH 202 Calculus and Analytic Geometry I.

Credits for calculus at UW-Green Bay may also be awarded for satisfactory performance on an AP exam. More details are available at http://www.uwgb.edu/oira/cfpl/ap/.

Retroactive credit for MATH 202 is not awarded to students who transfer to UW-Green Bay and have completed coursework deemed to be equivalent to MATH 203. If the student completes Math 209 or 305 at UW-Green Bay, they may submit an approved Retroactive Credit Form to the Registrar’s Office to be awarded credit for MATH 202 only.

Mathematics majors must choose an interdisciplinary minor. Examples are Environmental Science or Business Administration.

Students seeking information on teacher certification should contact the Education Office.

This disciplinary major also requires:
Completion of an interdisciplinary major or minor
Completion of one of the following areas of emphasis:

- Mathematics Emphasis
- Statistics Emphasis
# Mathematics Major with Mathematics Emphasis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting Courses</strong></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>MATH 202</td>
<td>Calculus and Analytic Geometry I</td>
<td></td>
</tr>
<tr>
<td>MATH 203</td>
<td>Calculus and Analytic Geometry II</td>
<td></td>
</tr>
<tr>
<td>MATH 209</td>
<td>Multivariate Calculus</td>
<td></td>
</tr>
<tr>
<td>MATH 260</td>
<td>Introductory Statistics</td>
<td></td>
</tr>
<tr>
<td><strong>Upper-Level Courses</strong></td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>MATH 305</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 314</td>
<td>Proofs in Number Theory and Topology</td>
<td></td>
</tr>
<tr>
<td>MATH 320</td>
<td>Linear Algebra I</td>
<td></td>
</tr>
<tr>
<td>MATH 321</td>
<td>Linear Algebra II</td>
<td></td>
</tr>
<tr>
<td>MATH 323</td>
<td>Analysis I</td>
<td></td>
</tr>
<tr>
<td>MATH 324</td>
<td>Analysis II</td>
<td></td>
</tr>
<tr>
<td>MATH 328</td>
<td>Introduction to Algebraic Structures</td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>Foundations of Geometry</td>
<td></td>
</tr>
<tr>
<td><strong>Elective Courses (choose one of the following):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 360</td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>MATH 361</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 410</td>
<td>Complex Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 425</td>
<td>Dynamical Systems</td>
<td></td>
</tr>
<tr>
<td>MATH 492</td>
<td>Special Topics in Mathematics</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>
# Mathematics Major with Statistics Emphasis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting Courses</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>MATH 202</td>
<td>Calculus and Analytic Geometry I</td>
<td></td>
</tr>
<tr>
<td>MATH 203</td>
<td>Calculus and Analytic Geometry II</td>
<td></td>
</tr>
<tr>
<td>MATH 209</td>
<td>Multivariate Calculus</td>
<td></td>
</tr>
<tr>
<td>MATH 260</td>
<td>Introductory Statistics</td>
<td></td>
</tr>
<tr>
<td><strong>Upper-Level Courses</strong></td>
<td></td>
<td><strong>31</strong></td>
</tr>
<tr>
<td>MATH 314</td>
<td>Proofs in Number Theory and Topology</td>
<td></td>
</tr>
<tr>
<td>MATH 320</td>
<td>Linear Algebra I</td>
<td></td>
</tr>
<tr>
<td>MATH 321</td>
<td>Linear Algebra II</td>
<td></td>
</tr>
<tr>
<td>MATH 323</td>
<td>Analysis I</td>
<td></td>
</tr>
<tr>
<td>MATH 324</td>
<td>Analysis II</td>
<td></td>
</tr>
<tr>
<td>MATH 360</td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>MATH 361</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 467</td>
<td>Applied Regression Analysis</td>
<td></td>
</tr>
<tr>
<td><strong>Elective Courses (choose one of the following):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 430</td>
<td>Design of Experiments</td>
<td></td>
</tr>
<tr>
<td>MATH 431</td>
<td>Multivariate Statistical Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 492</td>
<td>Special Topics in Mathematics</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>
# Mathematics Minor with Mathematics Emphasis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting Courses</strong></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>MATH 202</td>
<td>Calculus and Analytic Geometry I</td>
<td></td>
</tr>
<tr>
<td>MATH 203</td>
<td>Calculus and Analytic Geometry II</td>
<td></td>
</tr>
<tr>
<td>MATH 260</td>
<td>Introductory Statistics</td>
<td></td>
</tr>
<tr>
<td><strong>Upper-Level Courses</strong></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>MATH 320</td>
<td>Linear Algebra I</td>
<td></td>
</tr>
<tr>
<td><strong>Elective Courses (choose 9 credits of the following):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 305</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 314</td>
<td>Proofs in Number Theory and Topology</td>
<td></td>
</tr>
<tr>
<td>MATH 321</td>
<td>Linear Algebra II</td>
<td></td>
</tr>
<tr>
<td>MATH 323</td>
<td>Analysis I</td>
<td></td>
</tr>
<tr>
<td>MATH 324</td>
<td>Analysis II</td>
<td></td>
</tr>
<tr>
<td>MATH 328</td>
<td>Introduction to Algebraic Structures</td>
<td></td>
</tr>
<tr>
<td>MATH 360</td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>MATH 361</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>MATH 385</td>
<td>Foundations of Geometry</td>
<td></td>
</tr>
<tr>
<td>MATH 410</td>
<td>Complex Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 425</td>
<td>Dynamical Systems</td>
<td></td>
</tr>
<tr>
<td>MATH 492</td>
<td>Special Topics in Mathematics</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>
# Mathematics Minor with Statistics Emphasis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supporting Courses</td>
<td>12</td>
</tr>
<tr>
<td><strong>MATH 202</strong></td>
<td>Calculus and Analytic Geometry I</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 203</strong></td>
<td>Calculus and Analytic Geometry II</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 260</strong></td>
<td>Introductory Statistics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper-Level Courses</td>
<td>12</td>
</tr>
<tr>
<td><strong>MATH 320</strong></td>
<td>Linear Algebra I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective Courses (choose three of the following):</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 360</strong></td>
<td>Theory of Probability</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 361</strong></td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 430</strong></td>
<td>Design of Experiments</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 431</strong></td>
<td>Multivariate Statistical Analysis</td>
<td></td>
</tr>
<tr>
<td><strong>MATH 467</strong></td>
<td>Applied Regression Analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>24</td>
</tr>
</tbody>
</table>

Course List
3. The Academic Affairs Council and Dean's conclusions and recommendations from the program's last review;

To: Dean Scott Furlong

From: Steve Dutch, chair of the Academic Affairs Council

Date: June 24, 2011

Subject: Academic Affairs Council Review of the Mathematics Program

Overview

Dr. Davis, the chair of the Mathematics Program provided the Self-Study Report and the supporting materials in the spring of 2011 and the Academic Affairs Council reviewed and discussed the document with him. The AAC noted that the Mathematics Program has a clear mission statement that shares and supports the mission of the Natural and Applied Sciences program as well as the UW-Green Bay Core/Select Mission and the Guiding Principles. The acquisition of critical thinking, disciplinary and interdisciplinary problem solving, and communication are primary focuses for the Mathematics Program, which promotes an appropriate practical and theoretical mathematical knowledge and quantitative skills for a student to effectively market his/her expertise within a chosen profession and/or preparing for graduate studies.

Other areas of the Mathematics Program mission encompass:

- Providing a component of General Education Program that clarifies the importance of mathematics in our society and enhances the general mathematical literacy of our students.
- Providing supporting courses for all degree programs within Natural & Applied Sciences as well as many other undergraduate programs including pre-professional programs.
- Providing component of the Environmental Science and Policy and the Applied Leadership for Teaching and Learning graduate programs.
- Providing service to the University and local community in the form of remedial mathematics courses, consulting, workshops, etc.

The Mathematics Program’s anticipated student learning outcomes are clear, and the program offers four different options: majors and minors in both Mathematics and Statistics emphases.

Strengths and Accomplishments

The Mathematics Program serves UW-Green bay in a fundamental way. For example, the number of students needing to enroll in mathematics classes has increased up to the point such that “all sections of mathematics are enrolled to capacity and the program often looks to add additional sections”. This is because student recruiting for the Mathematics Program has been very active and successful. Also student demand for mathematical background in other areas has been increasing. To maximize benefit for students, the tenured faculty members in the Mathematics Program
have projects available for undergraduate students and lead various “independent studies covering a wide breadth of mathematical and statistical topics – both pure and applied”. The ACC noted that undergraduate research opportunities in mathematics have not been a requirement for post graduate employment or graduate study, so that the independent studies serve to enhance the students’ education beyond the minimum requirements for employment or graduate study.

Mathematics also has a strong connection with the Education Program in that the Mathematics emphasis has been developed to be consistent with the DPI guidelines for students who intend to be secondary school instructors. Similarly, the minor in Mathematics is appropriate for students that are to be certified at the lower-level (K-9).

The AAC also noted that the Mathematics Program has been “designed in a very stable fashion” even under increasing enrollments in the program, a reduced staff over the last couple of years due to extended medical leave of a tenured faculty member, and reaching for a new lecturer.

<table>
<thead>
<tr>
<th>Faculty listed on UWGB Mathematics website</th>
<th>Faculty appointment status</th>
<th>Approximate number of Independent Studies per year</th>
<th>Number of courses in their load that are specifically for the Math program per year</th>
<th>Has Advising responsibilities for Math students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>regular load</td>
<td>overload</td>
</tr>
<tr>
<td>Greg Davis</td>
<td>Professor</td>
<td>4 - 8</td>
<td>2 – 4</td>
<td>1 – 2</td>
</tr>
<tr>
<td>Tian-You Hu</td>
<td>Professor</td>
<td>2 - 4</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>David M. Dolan</td>
<td>Assoc. Prof.</td>
<td>1 - 2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Woo Jeon</td>
<td>Assoc. Prof.</td>
<td>2 - 4</td>
<td>6 – 7</td>
<td>0 – 1</td>
</tr>
<tr>
<td>Vladimir Kurenok</td>
<td>Medical Leave</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atife Caglar-Clark</td>
<td>Ass’t. Prof.</td>
<td>2 - 4</td>
<td>4</td>
<td>0 – 1</td>
</tr>
<tr>
<td>Theresa E. Adsit</td>
<td>Lecturer</td>
<td>7</td>
<td>0 – 1</td>
<td>1</td>
</tr>
<tr>
<td>James Meyer</td>
<td>Lecturer</td>
<td>7</td>
<td>0 – 1</td>
<td>1</td>
</tr>
<tr>
<td>May Guy</td>
<td></td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Also, the AAC note strong involvement from students and faculty members in the Mathematic Program as mentioned as following:

Under faculty guidance, a number of undergraduate students have organized a student organization known
as “Analytical Minds”. Currently they are considering actives such as tutoring on and off campus, fundraisers, and guest speakers.

Faculty members in the Mathematics Program continue to organize an on campus seminar series “Mathematics and Applications” so that they can share their ideas and interest in research and instructional development.

Concerns

One area in need of immediate attention is Actuarial Sciences. All faculty members in the Mathematics Program want to offer “a substantial curriculum” to students due to students’ demand and the large employment opportunities in this field. The Mathematics faculty has made initial plans for a program in Actuarial Sciences, but still need courses focused on preparing for the actuarial examinations in probability and in financial mathematics. Without additional resources, new course coverage would have to be met via reduction of other offerings or by overload. The program chair mentioned that paperwork would first need to be filed before they could formally begin, requiring at least another year. It would be advantageous to have a course contribution from the Business Program that would focus on derivative markets.

There have been several concerns and suggestions regarding creating and managing a Mathematics center to parallel the Writing Center because it would provide mathematical assistance and academic advising to students across the campus. At this point, with or without funds, a physical space would need to be designated for such a Center. This concept has been discussed for many years but invariably has proven infeasible due to resource shortages.

Another concern is large enrollments in Math 101. Currently, large enrollments in Math 101 are managed via a large number of sections, which diminishes the program’s abilities to offer other courses. The Mathematics Program has taken action to evaluate the possibility of alternative instruction methods such as online and self-paced.

In conclusion, the Mathematics Program has been strong and the current faculty members expect to maintain and strengthen in the program, and remain abreast of trends across the nation. The Mathematics Program should maintain their program structure, in line with the capabilities of their current faculty members.
To: Julia Wallace  
Provost and Vice Chancellor for Academic Affairs  

From: Scott Furlong  
Dean of Liberal Arts and Sciences  

Re: Report on the Mathematics Program Review  

I have examined the Self-Study Report prepared by the faculty in Mathematics, as well as the Program Review conducted by the Academic Affairs Council. Based on my examination of these materials I recommend continuation of the Mathematics. Specific comments that I made to the faculty include the following:

1. There is some concern regarding the decrease in the number of majors in the program over the past five years and this needs some further exploration by the faculty.

2. Despite the above, enrollments in Mathematics classes continue to be very strong because of the program support provided to other programs around campus.

3. The program has been hampered over the past few years by a prolonged sick leave by one of the faculty. It will be searching for a new position this year. I have recommended that the person hired be able to support the curriculum and research associated with the environmental sciences component of the larger NAS unit.

4. A more comprehensive assessment plan on student learning needs to be developed.

5. I support the work being done to explore the development of an Actuarial Science emphasis within the major, and perhaps the new faculty hire can support this as well. I also support the faculty efforts to increase undergraduate research opportunities.

6. I support additional discussions regarding the development of a Mathematics Center and encouraged collaborations with Student Support Services.

Cc: Greg Davis, Chair NAS  
Tim Sewall, Associate Provost  
Steve Dutch, Chair AAC
To: Greg Davis  
Chair, Mathematics

From: Scott Furlong  
Dean of Liberal Arts and Sciences

Re: Report on the Mathematics Program Review

The Mathematics program at the University of Wisconsin-Green Bay is a disciplinary program that focuses on “inquiry, critical thinking, disciplinary and interdisciplinary problem solving, and communication.” This is done in the context of providing a formal education in mathematical sciences. The program provides necessary support for a number of other university requirements as well as majors/minors around campus. Some of these include: the university mathematics competency requirement, statistics and other supporting math courses for a number of majors (e.g., Environmental Science, Human Biology, all the science disciplinary majors). A number of the faculty are key contributors to the graduate programs in Environmental Science and Policy, and to a lesser degree the Applied Leadership for Teaching and Learning. It is a program that continues to be closely aligned with the mission of the institution, and many of the faculty are integrated fundamentally with issues of environmental concerns in curricular and scholarly ways.

Enrollment Trends/Resource Issues:

The Mathematics has averaged 80 majors over the past five years, although I note a drop in majors since 2006 (from 105 to 52) and this is something that the faculty needs to pay attention to in the coming years. Disregarding the number of majors, mathematics classes in most cases have strong (and in some cases over) enrollment. We offer many sections of Math 101, 104, 202, 203, and 260 every year and they typically all fill to capacity. There have been situations over the past years where we have had to add additional sections of these classes to meet demand. I have been particularly concerned in meeting the needs of some of our better incoming students that may need one of the Calculus courses when starting their education. The strength of these class enrollments has much to do with the program’s support of other majors such as Human Biology, Environmental Sciences, and the other disciplinary science programs. Some of the faculty also teach classes within the Environmental Science curriculum.

During the past few years the program has been operating without full faculty resources due to a prolonged sick leave of one of its faculty. This will be addressed in the coming year. The number of lower level sections needed also prevents the faculty from offering a wider range of upper level classes. The faculty’s participation in the graduate program tends to fall primarily on a few people, which affects overload workload. Mathematics (and NAS) will be searching this for a new faculty member and I strongly recommend that the individual hired can adequately participate in, and support, the ES&P program to help alleviate some of the workload issues.

Assessment:

Mathematics have six learning outcomes that are well defined and relevant not only for the program but to the university. The self-study correctly notes that there has been little progress made regarding the assessment of the
program’s learning outcomes. Their existing methods include the use of alumni surveys and “semi-formal discussion of students’ work…” The program notes that more needs to be done here but has not been able to address this due to resource constraints. This is a critical need at this point and is an area that needs to be addressed by the faculty.

Curriculum Development/General Education:

There have not been any significant changes to the Mathematics curriculum since the last review. The program has a significant common core that all majors take and then two emphases (Mathematics and Statistics) beyond the core. The faculty have been in discussions for a couple of years to develop an Actuarial Science emphasis that they believe will be appealing to students. They are a couple of courses away from their ability to offer such an emphasis but this could potentially be addressed with the new hire. The program also plans to become more involved in offering undergraduate research opportunities.

While the Mathematics courses are not part of the formal general education program, they are necessary for helping students to meet the Math competency requirement. Faculty in the program do teach and support general education through other courses outside of Mathematics.

As discussed in the last review, there continues to be an interest to develop a Mathematics Center, similar to the Writing Center, that would provide support to students and also serve as a way to organize workshops and lectures. This could be a good idea and I would encourage the faculty to explore this and include Student Support Services in these discussions.

In summary, the Mathematics program continues to be an important part of the UW-Green Bay curriculum. The major program is coherent and provides a well-rounded education for its students. The program supports the university missions and is critical for a number of other majors and programs around campus both in CLAS and CPS. There proposed idea to add an actuarial science emphasis could provide some interesting opportunities for our students. More work is necessary toward assessment of student learning outcomes.

Cc: Steve Dutch, Academic Affairs Council
    Tim Sewall, Associate Provost
4. The program's Assessment Plan and Annual Updates on Student Outcomes Assessment (see the descriptions below). These processes will be coordinated by the University Assessment Council, the UAC's Academic Program Assessment Subcommittee and are described in the University Assessment Plan.

Mathematics 2014-2015 Assessment Plan

1. Which outcome will you assess?

   1. Mathematics majors will be able to understand important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.

   2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.

   4. Mathematics majors will be able to pose mathematical/statistical problems and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

2. Which technique will you use to assess this outcome?

   • MATH 385 – It will be assessed via a combination of assignments and exams.

3. Which course or group of students will you assess on the outcome chosen above and when?

   • Students in MATH 385 will be assessed in Spring 2015

4. Who will do the assessment and coordinate the data collection and reporting?

   • Woo Jeon will collect and report on the assessment data for MATH 385.


Please give a brief overview of the assessment data you collected this year.

The assessment data was collected through MATH 385 Foundations of Geometry for spring 2015.

1. It is a required course for Mathematics majors with a Mathematics emphasis and an elective course for Mathematics minors with a Mathematics emphasis.

2. It includes interdisciplinary contents that explores many topics of mathematics including Calculus, Linear Algebra, Analysis, Number Theory, Topology, and Geometry (Euclidean and Non-Euclidean). Students will apply them to the areas of History (Mathematics), Hyperbolic Space (Physics & Astronomy), transformation (picture distortion), Chaos Theory, Projective geometry (drawings), etc. So, several questions span across of the semester. It is problem-focused and students will write a lot of (mathematical) proofs.

3. There were 4 senior students who started the course for spring 2015 and all 4 students finished the course successfully with grade A or AB.

4. All 4 students were Mathematics majors with 1 or more other majors (Environmental Science, Bachelor of Science, Human Development, Business Administration, Computer Science).

5. The assessment includes a combination of 3 midterms, and the final.

6. All the exam problems are free-response, mostly consisting of proofs.

7. The following outcomes were assessed:
LO1. Mathematics majors will be able to understand the important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.

LO2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.

LO4. Mathematics majors will be able to pose mathematical/statistical problems, and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

How will you use what you’ve learned from the data that was collected?

1. The students achieved an average score of 94.3%
2. The data shows that all of the students successfully demonstrated their understanding of most of the important concepts and skills. Their skills at proof writing were more than sufficient.
3. All LO1, LO2, LO4 were successfully implemented for spring 2015.

Mathematics 2015-2016 Assessment Plan

1. Please review last year’s assessment results (2014-2015) with the faculty in your program. How does your program plan to take these results into consideration for future programmatic planning?
   - No further curricular revision planned with this learning outcome.

2. Which outcome will you assess this year (2015-2016)?

   1. Mathematics majors will be able to understand important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.

   2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.

   4. Mathematics majors will be able to pose mathematical/statistical problems and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

3. Which technique will you use to assess this outcome?

   - MATH 385 – It will be assessed via a combination of assignments and exams.

4. Which course or group of students will you assess on the outcome chosen above and when?

   - Students in MATH 385 will be assessed in Spring 2016.

Mathematics 2015-2016 Assessment Report

Please give a brief overview of the assessment data you collected this year.

The assessment data was collected through MATH 385 Foundations of Geometry for spring 2015.
1. It is a required course for Mathematics majors with a Mathematics emphasis and an elective course for Mathematics minors with a Mathematics emphasis.

2. It includes interdisciplinary contents that explores many topics within mathematics including Calculus, Linear Algebra, Analysis, Number Theory, Topology, and Geometry (Euclidean and Non-Euclidean). Students will apply them to the areas of History (Mathematics), Hyperbolic Space (Physics & Astronomy), transformation (picture distortion), Chaos Theory, Projective geometry (drawings), etc. So, several questions span across of the semester. It is problem-focused and students will write a lot of (mathematical) proofs, making this a best fit for Capstone experiences.

3. There were 12 students (2 juniors and 10 seniors) who started the course for spring 2016 and all 12 students passed the course with grade C (2 student) and above.

4. All 12 students were having Mathematics major with 1 or more other majors (Education, Certificate in Sustainability, Environmental Science, Spanish & Latin American Studies, Bachelor of Science, History, Music, Business Administration, Computer Science).

5. The assessment includes a combination of 6 midterms, 1 midterm, and the final.

6. All the exam problems are free-response, mostly consisting of proofs.

7. The following outcomes were assessed:

   LO1. Mathematics majors will be able to understand the important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.

   LO2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.

   LO4. Mathematics majors will be able to pose mathematical/statistical problems, and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

**How will you use what you’ve learned from the data that was collected?**

1. The students achieved an average score of 83.9%
2. The data shows that most of the students successfully demonstrated their understanding of most of the important concepts and skills. Their skills at proof writing were sufficient.
3. All LO1, LO2, LO4 were successfully implemented for spring 2016.

**Program: Mathematics**

**Program Assessment Coordinator:** Woo Jeon

**Date:** December 15, 2016

**Academic Program Assessment Plan (2016-2017)**

The questions below will form the outline for your programmatic assessment for this academic year. The Assessment Plans should be determined by the end of the fall semester, December 16, 2016. All Assessment Plans should be implemented by the end of the spring semester with results compiled in May 2017. Reports including those results are due June 1, 2017.

You can find your program’s Learning Outcomes as well as previous Assessment Plans and Reports on the Assessment website: [http://www.uwgb.edu/assessment/](http://www.uwgb.edu/assessment/).

1. Please review last year’s assessment results (2015-2016) as well as the Academic Program Assessment Report with the faculty in your program. How does your program plan to take these results into consideration in future programmatic planning?
• No further curricular revision planned with those results.

2. Please review your program’s Learning Outcomes. Do any of them need to be updated or clarified?
   • No further revision planned with the current Mathematics Program learning outcomes.
   a. Please provide brief indications of the kinds of assessment (e.g. course exams, term papers, course projects, senior seminar, senior interview, etc.) that might be used to assess each outcome. (The purpose here is to see that your program has considered ways it might measure each outcome.)
   • MATH 328 (Fall 2016) & MATH 385 (Spring 2017) – They will be assessed via combinations of assignments and exams.
   b. Please compare your Learning Outcomes to the University’s main learning objectives: interdisciplinary, problem-focused education; critical thinking; diversity; environmental sustainability; and engaged citizenship. (These objectives were identified in the MLLO Project, which may be found here: http://www.uwgb.edu/MLLO/.) Which programmatic outcomes match university mission outcomes?
   • problem-focused education; critical thinking

There is no requirement that all, or even any, program outcomes match the MLLO outcomes. However, since these outcomes have been identified as the core of UWGB’s mission, and since virtually every program has identified critical thinking, problem solving, and interdisciplinarity as core learning objectives, programs may wish to review their outcomes if few or no outcomes seem to match these objectives.

3. Which outcome will you assess this year (2016-2017)?

1. Mathematics majors will be able to understand important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.
2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.
3. Mathematics majors will be able to pose mathematical/statistical problems and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

4. Which technique will you use to assess this outcome?
   • Assignments and exams will be designed to assess the outcome and students’ proof will be checked to assess them.

(You may, for example, wish to include a combination of direct and indirect methods. Methods such as tests, embedded assessment, papers, projects, laboratory procedures, competence interviews or musical performance and/or indirect measures, for example, student perceptions and experiences, survey data, portfolios, records of job placement, graduate admissions, etc.)

5. Which course or group of students will you assess on the outcome chosen above and when?
   • All the students in MATH 328 will be assessed in Fall 2014.
   • All the students in MATH 385 will be assessed in Spring 2015

(Please keep in mind that assessment should be a snapshot of what you’re doing. You do not need to assess every single student in your major, but rather a sample group that is large enough to get reliable data.)

In preparing this portion of your assessment plan, it may be useful to you to create a crosswalk of your courses, mapping which learning outcomes are met by which courses or program requirements. Such a crosswalk might look like this:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Learning Outcome 1</th>
<th>Learning Outcome 2</th>
<th>Learning Outcome 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 328</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>MATH 385</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Please give a brief overview of the assessment data you collected this year.

The assessment data was collected through

- MATH 328 Introduction to Algebraic Structures for fall 2016
- MATH 385 Foundations of Geometry for spring 2017

They are required courses for Mathematics majors with a Mathematics emphasis and an elective course for Mathematics minors with a Mathematics emphasis. The following outcomes were assessed:

LO1. Mathematics majors will be able to understand the important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.

LO2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.

LO4. Mathematics majors will be able to pose mathematical/statistical problems, and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

MATH 328 Introduction to Algebraic Structures for fall 2016

1. It includes interdisciplinary contents that explore many topics within mathematics including Calculus, Linear Algebra, Number Theory, Topology, and Geometry. Students will apply them to the areas of Abstract Algebra. So, this course is a purely disciplinary course in Mathematics. It is problem-focused.
2. There were 11 students (1 junior and 10 seniors) who started the course for fall 2016. 10 students passed the course with grade C (1 student) and above. 1 student received a grade D.
3. 8 students were Mathematics majors with 1 or more other majors (Human Biology, Global Studies, Education, Business Administration, English, Environmental Science, Music, Computer Science). 3 students were Computer Science majors.
4. The assessment includes a combination of 6 assignments, 1 midterm, and the final.
5. All the assignments and exam problems are free-response, mostly consisting of proofs.
6. Students had to demonstrate the ability to follow, construct, and write mathematical proofs using knowledge derived from the major content areas of Abstract Algebra (Group Theory, Ring Theory, Vector Spaces, and Field Theory).

MATH 385 Foundations of Geometry for spring 2017

1. It includes interdisciplinary contents that explore many topics within mathematics including Calculus, Linear Algebra, Analysis, Number Theory, Topology, and Geometry (Euclidean and Non-Euclidean). Students will apply them to the areas of History (Mathematics), Hyperbolic Space (Physics & Astronomy), transformation (picture distortion), Chaos Theory, Projective geometry (drawings), etc. So, several questions span across the semester.
2. It is problem-focused and students will write a lot of (mathematical) proofs. It will be a course for Capstone experiences starting next academic year (approved).
3. There were 9 students (2 juniors and 7 seniors) who started the course for spring 2017 and all 9 students passed the course with grade C (1 student) and above.
4. All 9 students were Mathematics majors with 1 or more other majors (Education, Accounting, Humanistic Studies, Business Administration, Economics, English, Environmental Science, and Computer Science).
5. The assessment includes a combination of 5 assignments, 1 midterm, and the final.
6. All the assignments and exam problems are free-response, mostly consisting of proofs.
7. Students had to demonstrate the ability to follow, construct, and write mathematical proofs using knowledge derived from the major content areas of Calculus, Number Theory, Linear Algebra, and Geometry (Euclidean and Non-Euclidean).

How will you use what you’ve learned from the data that was collected?

MATH 328 Introduction to Algebraic Structures for fall 2016

1. The students achieved an average score of 84.0%
2. The data shows that 9 out of 11 students were clear in understanding about most of the important concepts and skills. Their skills at proof writing were sufficient. 2 students needed to pay more attention to their weekly assignments and attendance.
3. 7 students who had 60 or 70 out of 70 attendance points achieved 87.3% or higher. 2 students who had 30 out of 70 attendance points achieved 70.7% or 76.9%. 2 students who had 10 or 20 out of 70 attendance points achieved 58.7% or 65.1%. Therefore, we concluded that a student’s performance in the course had a strong positive correlation with their attendance.
4. The implementation of LO1, LO2, LO4 were satisfactory for fall 2016.

MATH 385 Foundations of Geometry for spring 2017

1. The average score that the students achieved was 90.4%
2. The data shows that all of the students were clear in understanding about most of the important concepts and skills. Their skills at proof writing were very sufficient.
3. All LO1, LO2, LO4 were successfully implemented for spring 2017.