Academic Department: **Mathematical and Computer Sciences**

Individual(s) Completing the Questionnaire/Report: Bennette Harris

**BACKGROUND INFORMATION**

1. Please list the majors (including emphasis areas), minors, and/or certificates offered by your department.

   **Majors (and emphases):**
   - MATHEMATICS [BA/BS APPLIED MATHEMATICS]
   - MATHEMATICS [BA/BS PURE MATH]
   - MATHEMATICS [BA/BS MATH STAT]
   - MATHEMATICS [BA/BS] COMPUTER EMPHASIS
   - MATHEMATICS [BSE SECONDARY ED]

   **Minors:**
   - MATHEMATICS
   - MATHEMATICS: SECONDARY EDUCATION EMPHASIS
   - MATHEMATICS: ELEMENTARY EDUCATION EMPHASIS
   - COMPUTER SCIENCE
   - WEB SITE DEVELOPMENT AND ADMINISTRATION

   **Certificates:**
   - WEB SITE DEVELOPMENT AND ADMINISTRATION

2. Fill in the data requested below relevant to enrollments and the number of graduates. Also, please estimate the percentage of student credit hours (SCH) your department's curriculum serves relevant by both: 1) student level (e.g., freshmen, sophomores); and 2) majors, minors, interdisciplinary programs, and general education requirements.

   *(Skip to Question #3. This information will be secured and filled in by the Campus Self-Study Coordinator)*

   **Enrollment (Headcount)**

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<tr>
<th>Academic Year</th>
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   **Graduates (Majors & Minors)**

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<tr>
<th>Academic Year</th>
<th># of Majors</th>
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   **SCH Distribution**

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<th>Student Level</th>
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Higher Learning Commission
Self-Study Questionnaire/Report for Academic Departments
3. Overview and evaluate the adequacy of the human, physical, and fiscal resources your department deploys to serve students and meet other programmatic needs by addressing the questions below:

**Human Resources**
Evaluate the general adequacy of the human resources (i.e., the # of faculty and instructional staff and their skills) relative to the department’s ability to serve its student populations and achieve other programmatic goals. Do this by assigning a number between “1” (completely inadequate) to “9” (completely satisfies needs).

7 1-9

In a paragraph or two, discuss the human resources evaluation score you provided. Include, in particular, a discussion of unique strengths as well as important needs not being met or opportunities not being explored because of limitations.

The human resources are excellent in the area of traditional mathematics, but are lacking in mathematics education and computer science (although searches in progress may help this situation considerably). The burden placed on the faculty by service courses and by the need to stretch out of their areas of primary expertise into mathematics education and computer science limits the department’s ability to expand its programs. We are especially strong in the areas of abstract algebra, applied mathematics, and statistics, and our program offerings are designed to capitalize on these areas of strength.

We have identified several areas of need in our curriculum that we have been unable to explore at present due to current staffing restrictions. These include overall program analysis to better link program and course objectives to assessment; incorporation of technology into upper-level mathematics courses; realignment of the computer science curriculum to minimize overlap with Management Computer Systems; and exploring new computer science initiatives such as computer forensics and computer security.

**Physical Resources**
Evaluate the adequacy of the physical resources available to support the department’s ability to serve its student population and achieve programmatic goals by assigning a number between “1” (completely inadequate) to “9” (completely satisfies needs). Consider such issues as classroom space, office space, supporting technology, lab space to support research and/or instruction, etc.

7 1-9

In a paragraph or two, discuss the physical resource evaluation score you provided. Include, in particular, a discussion of unique strengths as well as important needs not being met or opportunities not being explored because of limitations.
our parent College of Letters and Sciences have been generous in helping the department fund technology needs both in and out of the classroom. New instructional computer lab facilities are cutting-edge. On the other hand, over the past decade the University has made a conscious shift from being primarily a teaching institution to one with a blended teaching/research focus. In our particular discipline, however, there has been no accompanying increase in access to research materials. In mathematics and computer science, this means access to research journals, and library resources in this area are insufficient. Most department researchers do their background work in Madison or Milwaukee, and have essentially abandoned any attempt to upgrade the research library here.

Fiscal Resources
While recognizing that every academic department would benefit from a larger budget, evaluate the adequacy of fiscal resources allocated to the department to serve its student populations and achieve other programmatic goals by assigning a number between “1” (completely inadequate) to “9” (completely satisfies needs).

8 1-9

In a paragraph or two, discuss the fiscal resources evaluation score you provided. Include, in particular, a discussion of key expenses, and key needs not being met or opportunities not being explored because of fiscal limitations.

Our current budget encourages fiscal responsibility, but is not unduly restrictive. While we would be able to expand tutoring services with more budget allocation in that area, most other department needs are met by a combination of department funds and generosity from the college dean. Areas of pressure include acquisition of computer software (especially Mathematica) for both faculty and students, and travel funds, but again essential needs in these areas are being met from existing funds.

Departments on this campus do not control faculty salaries; this is an area of extreme need, since our ability to hire in computer science and mathematics education is hampered by the salaries the campus can offer, but this does not come from the department’s budget.

4. In a paragraph or two, overview significant changes made in your department or its curriculum since 1996 (i.e., the last North Central Association Accreditation Visit).

The department added, then dropped, three majors: (1) Space Mathematics, (2) Applied Mathematics of the Earth System and Space Sciences Broadfield, and (3) Applied Mathematics and Computer Science Broadfield. The department added three majors: (1) Applied Mathematics; (2) Mathematics-Statistics Emphasis; and (3) Mathematics-Computer Emphasis. The department added a web Development minor and certificate program. The department combined the Computer Science and Computer Science Education minors into a single minor.

In another paragraph or two, describe why these changes occurred.

The department has made a concerted effort since 1996 to update and modernize its curriculum. Capitalizing on our association with the Wisconsin Space Grant Consortium and faculty ties to NASA, we began offering two majors closely tied to space science. We also sought to capitalize on our close association the University’s Management Computer Systems (MCS) program and with the perceived need for enhanced computational skills in our graduates by offering blended mathematics/computer science majors. We also sought to fill a need in the area of actuarial mathematics with a new statistics emphasis. Enrollments in space mathematics and computer science were not promising, however, and when a key faculty member left the institution the department conducted an extensive internal evaluation of the new programs. It became clear the department had over-extended itself, and so the space mathematics majors were reformed as an applied mathematics emphasis, and the computer science emphases were combined into a single offering.
The new web development programs were created in response to growing industry needs in this area, and to complement the existing MCS majors. The Computer Science minors were combined at the request of the College of Education to solidify the skills of education majors seeking certification in computer science.

MISSION & PLANNING

5. In a paragraph or two, describing any significant projects/initiatives that your department is planning or currently has underway, but has not yet completed.

(1) The department is working to develop a complete objectives-based description of its lower division courses, and from these develop pre- and post- tests to better guide students through the general studies service courses, and unify the first two years for mathematics majors. The department intends to focus on the articulation between courses in sequence. The end result should produce better initial placement for entering students, and a smoother transition for students progressing through the curriculum.

(2) The department has for some time been interested in developing majors/minors in the area of computer security. The new forensics programs in the college make this even more worth exploring. It is hoped that a new hire in computer science this spring will move this project forward.

(3) The department is considering a major revision in a standard service course, Finite Mathematics. Roughly one-half of the current course as it is taught here and across the country focuses on a skill that has now been supplanted by modern technology. We anticipate recasting this skill in a more appropriate and useful light.

(4) The department anticipates, in the next two-years, to re-evaluate the fundamental nature of the teaching of higher-level mathematics. Technological advances are changing the nature of modern mathematics research, and we anticipate curricular changes to better prepare our graduates in this area.

6. Below are five “core values” the University identifies as central to its purposes. Please evaluate the importance of each core value in terms of how each aligns with the purposes of your department (i.e., take a hypothetical 100 points and distribute them among the five values, with those values that align more closely to the purposes of your department receiving more points).

<table>
<thead>
<tr>
<th>Core Value</th>
<th>Importance (100 points)</th>
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<tbody>
<tr>
<td>Commitment to the pursuit of knowledge and understanding</td>
<td>30</td>
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<tr>
<td>Development of the individual</td>
<td>30</td>
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<tr>
<td>Personal and professional integrity</td>
<td>20</td>
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<tr>
<td>Commitment to serve</td>
<td>10</td>
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<tr>
<td>Commitment to develop a sense of community, respect for diversity, and global perspectives</td>
<td>10</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100 points</strong></td>
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</tbody>
</table>

7. Every academic department engages in planning. Review the list of variables below and evaluate the extent to which each of the following influences decision-making behind the planning process for your department as it relates to your curriculum (i.e., take a hypothetical 100 points and distribute them among the planning variables, with those variables playing a larger role in your planning process receiving more points).

<table>
<thead>
<tr>
<th>Planning Variables</th>
<th>Importance (100 points)</th>
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<tbody>
<tr>
<td>The mission of the University, college, and/or department</td>
<td>10</td>
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<tr>
<td>Academic assessment data/information relevant to student performance against learning outcomes</td>
<td>10</td>
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<tr>
<td>Other data/information gathered relevant to performance (e.g., Audit &amp; Review feedback)</td>
<td>5</td>
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</table>
Societal/Cultural trends (e.g., changes in demographics, lifestyles, professions) | 15
Campus trends (e.g., changes in university-initiated needs and demands) | 15
Technology trends (e.g., technology developments that affect delivery of service) | 15
Professional trends (e.g., changes evident at other universities/colleges) | 15
Available human resources (e.g., # of employees, talents, etc.) within the unit | 5
Available fiscal resources (e.g., budget, available and accessible $) | 5
Available physical resources (e.g., space, existing technology, etc.) | 5
Other: | 0
Total= 100 points

8. Does your department have a mission statement?
   Yes X No

   If you answered “yes,” please list the mission statement here. Also, if your mission statement can be accessed on the web, please list the URL here. http://math.uww.edu/mission.php

DEPARTMENT MISSION STATEMENT

Mathematics has traditionally been the language of the physical sciences and now plays an important role in the social and biological sciences as well. Every field of endeavor in which quantitative activity is found requires that its participants possess a strong background in mathematics.

Computer Science is a discipline of modern origin in which the theory and applications of high speed machine computation, of efficient data processing, of advanced graphics design, and of machine assisted simulation and problem solving are developed and studied.

The programs of the Department of Mathematical and Computer Sciences are centered in these two fields and are listed in the following categories. The department:

BASIC MATHEMATICS AND COMPUTING

- monitors and guides the remedial mathematics curriculum,
- manages the curriculum and offers courses to satisfy university proficiency requirements in basic mathematics,
- offers foundation courses for all students in computer science and computer applications,

MAJOR AND MINOR PROGRAMS

- offers an undergraduate liberal arts major in mathematics containing several specialty tracks: actuarial mathematics, statistics, pure mathematics (algebra and analysis), applied-space mathematics,
- offers an undergraduate major for secondary school teachers,
- offers a minor program in mathematics for elementary school teachers,
- offers a minor program in computer science,
- offers, in cooperation with the Management Department, a major in information sciences, the major in Management Computer Systems,

SERVICE PROGRAMS
• offers courses to satisfy program requirements of departments in the College of Business and Economics,
• offers courses to satisfy the mathematical and computing requirements of the physical and biological sciences,
• offers courses in statistics to support programs in the social sciences,

SUPPORT ACTIVITIES

• supports and engages in research at the professional level in mathematics, computer science, theoretical physics and space science,
• supports undergraduate independent study and research in the mathematical and computer sciences,
• supports community involvement in mathematics education,
• offers professional support to university colleagues engaged in projects related to mathematics and computing.

If you answered “yes,” please describe how, if at all, this mission statement plays a role in your department’s planning and/or decision-making, particularly as it relates to the curriculum.

All department planning and curricular decision-making is done in light of the mission statement, and its relation to the broader missions of the college and university. The mission provides an answer to the fundamental question, “What should we be doing?”

STUDENT LEARNING & ASSESSMENT

9. List all the student learning outcomes for each of the majors (and emphases, if relevant), minors, and certificate programs that you identified in question #1.

Majors (and emphases):
Core Objectives (common to all mathematics majors/emphases)
Each mathematics major is to demonstrate:
2. Effective oral communication of mathematical ideas.
3. Effective written communication of mathematical ideas.
4. Ability to read and understand mathematical exposition at an appropriate level.
5. Ability to work effectively in small group settings on mathematical projects.
6. Ability to use mathematics to set up and solve problems (“story problems”, mathematical models, etc.).
7. Understanding of the role of logic and the nature of mathematical truth (theorems, hypotheses, conclusions, conjectures, what constitutes a valid proof)
8. Ability to use current technology (calculators, computers, software, etc.) to set up and solve problems, explain mathematical ideas, etc.
9. Ability to integrate course materials with other areas inside and outside of mathematics.

MATHEMATICS (BA/BS APPLIED MATHEMATICS)
1. Modeling: Given a physical situation, be able to construct a reasonable mathematical model that contains the essential features of the problem.
2. Solution: Be able to select and apply the appropriate mathematical techniques/methods needed in order to solve the model. In order to obtain the solution, both analytic and computational (numeric and symbolic) calculations are required.
3. Interpretation: Once a solution(s) is obtained, be able to understand the meaning, applicability and limitation(s) of the solution to the proposed model.
4. Communication: Be able to communicate the results, methodology and recommendations in a clear and concise manner. The communication modes will be written, oral and visual presentations.

MATHEMATICS (BA/BS PURE MATH)
Emphasis-specific objectives are still being developed

MATHEMATICS (BA/BS MATH STAT)
Emphasis-specific objectives are still being developed

MATHEMATICS (BA/BS) COMPUTER EMPHASIS
Students graduating from this program will
1. obtain general mathematical problems solving skills so they can find mathematical approaches to a wide variety of numerical and relational problems.
2. be able to understand abstract concepts as common in advanced mathematics.
3. have skills to understand and build mathematical and computer models for real world applications.
4. develop a wide range of computer programming skills.
5. be familiar with computer application packages which could be of use in solving scientific calculation or modeling problems.
6. have an understanding of computers and their use in solving numerical problems.

MATHEMATICS (BSE SECONDARY ED)
(Taken from the Wisconsin DPI Content Guidelines for Mathematics)
The Mathematics teacher will demonstrate knowledge of and skill in:
1. The structures within the discipline, the historical roots and evolving nature of mathematics, and the interaction between technology and the discipline.
2. Facilitating the building of student conceptual and procedural understanding.
3. Helping all students build understanding of the discipline including:
   • Confidence in their abilities to utilize mathematical knowledge.
   • Awareness of the usefulness of mathematics.
   • The economic implications of fine mathematical preparation.
4. Exploring, conjecturing, examining and testing all aspects of problem solving.
5. Formulating and posing worthwhile mathematical tasks, solving problems using several strategies, evaluating results, generalizing solutions, using problem solving approaches effectively, and applying mathematical modeling to real-world situations.
6. Making convincing mathematical arguments, framing mathematical questions and conjectures, formulating counter-examples, constructing and evaluating arguments, and using intuitive, informal exploration and formal proof.
7. Expressing ideas orally, in writing, and visually; using mathematical language, notation, and symbolism; translating mathematical ideas between and among contexts.
8. Connecting the concepts and procedures of mathematics, drawing connections between mathematical strands, between mathematics and other disciplines, and with daily life.
9. Selecting appropriate representations to facilitate mathematical problem solving and translating between and among representations to explicate problem-solving situations.
10. Mathematical processes including:
    • Problem solving.
    • Communication.
    • Reasoning and formal and informal argument.
    • Mathematical connections.
    • Representations.
    • Technology.

11. Number operations and relationships from both abstract and concrete perspectives, identifying real world applications, and representing and connecting mathematical concepts and procedures including:
12. Mathematical concepts and procedures, and the connections among them for teaching upper level number operations and relationships including:

- Advanced counting procedures, including union and intersection of sets, and parenthetical operations.
- Algebraic and transcendental numbers.
- The complex number system, including polar coordinates.
- Approximation techniques as a basis for numerical integration, fractals, and numerical-based proofs.
- Situations in which numerical arguments presented in a variety of classroom and real-world situations (e.g., political, economic, scientific, social) can be created and critically evaluated.
- Opportunities in which acceptable limits of error can be assessed (e.g., evaluating strategies, testing the reasonableness of results, and using technology to carry out computations).

13. Geometry and measurement from both abstract and concrete perspectives and to identify real world applications, and mathematical concepts, procedures and connections among them including:

- Formal and informal argument.
- Names, properties, and relationships of two- and three-dimensional shapes.
- Spatial sense.
- Spatial reasoning and the use of geometric models to represent, visualize, and solve problems.
- Transformations and the ways in which rotation, reflection, and translation of shapes can illustrate concepts, properties, and relationships.
- Coordinate geometry systems including relations between coordinate and synthetic geometry, and generalizing geometric principles from a two-dimensional system to a three-dimensional system.
- Concepts of measurement, including measurable attributes, standard and nonstandard units, precision and accuracy, and use of appropriate tools.
- The structure of systems of measurement, including the development and use of measurement systems and the relationships among different systems.
- Measurement including length, area, volume, size of angles, weight and mass, time, temperature, and money.
- Measuring, estimating, and using measurement to describe and compare geometric phenomena.
- Indirect measurement and its uses, including developing formulas and procedures for determining measure to solve problems.

14. Mathematical concepts, procedures, and the connections among them for teaching upper level geometry and measurement including:

- Systems of geometry, including Euclidean, non-Euclidean, coordinate, transformational, and projective geometry.
- Transformations, coordinates, and vectors and their use in problem solving.
- Three-dimensional geometry and its generalization to other dimensions.
- Topology, including topological properties and transformations.
- Opportunities to present convincing arguments by means of demonstration, informal proof, counter-examples, or other logical means to show the truth of statements and/or generalizations.
15. Statistics and probability from both abstract and concrete perspectives and to identify real world applications, and the mathematical concepts, procedures and the connections between them including:
   • Use of data to explore real-world issues.
   • The process of investigation including formulation of a problem, designing a data collection plan, and collecting, recording, and organizing data.
   • Data representation through graphs, tables, and summary statistics to describe data distributions, central tendency, and variance.
   • Analysis and interpretation of data.
   • Randomness, sampling, and inference.
   • Probability as a way to describe chances or risk in simple and compound events.
   • Outcome prediction based on experimentation or theoretical probabilities.

16. Mathematical concepts, procedures, and the connections among them for teaching upper level statistics and probability including:
   • Use of the random variable in the generation and interpretation of probability distributions.
   • Descriptive and inferential statistics, measures of disbursement, including validity and reliability, and correlation.
   • Probability theory and its link to inferential statistics.
   • Discrete and continuous probability distributions as bases for inference.
   • Situations in which students can analyze, evaluate, and critique the methods and conclusions of statistical experiments reported in journals, magazines, news media, advertising, etc.

17. Functions, algebra, and basic concepts underlying calculus from both abstract and concrete perspectives and to identify real world applications, and the mathematical concepts, procedures and the connections among them including:
   • Patterns.
   • Functions as used to describe relations and to model real world situations.
   • Representations of situations that involve variable quantities with expressions, equations and inequalities and that include algebraic and geometric relationships.
   • Multiple representations of relations, the strengths and limitations of each representation, and conversion from one representation to another.
   • Attributes of polynomial, rational, trigonometric, algebraic, and exponential functions.
   • Operations on expressions and solution of equations, systems of equations and inequalities using concrete, informal, and formal methods.
   • Underlying concepts of calculus, including rate of change, limits, and approximations for irregular areas.

18. Mathematical concepts, procedures, and the connections among them for teaching upper level functions, algebra, and concepts of calculus including:
   • Concepts of calculus, including limits (epsilon-delta) and tangents, derivatives, integrals, and sequences and series.
   • Modeling to solve problems.
   • Calculus techniques including finding limits, derivatives, integrals, and using special rules.
   • Calculus applications including modeling, optimization, velocity and acceleration, area, volume, and center of mass.
   • Numerical and approximation techniques including Simpson’s rule, trapezoidal rule, Newton’s Approximation, and linearization.
   • Multivariate calculus.
   • Differential equations.

19. Discrete processes from both abstract and concrete perspectives and to identify real world applications, and the mathematical concepts, procedures and the connections among them including:
   • Counting techniques.
   • Representation and analysis of discrete mathematics problems using sequences, graph theory, arrays, and networks.
   • Iteration and recursion.
20. Mathematical concepts, procedures, and the connections among them for teaching upper level discrete mathematics including:
   - Topics, including symbolic logic, induction, linear programming, and finite graphs.
   - Matrices as a mathematical system, and matrices and matrix operations as tools for recording information and for solving problems.
   - Developing and analyzing algorithms.

Minors:
MATHEMATICS
   Same as core objectives

MATHEMATICS: SECONDARY EDUCATION EMPHASIS
   Same as BSE-specific objectives

MATHEMATICS: ELEMENTARY EDUCATION EMPHASIS
   Specific objectives are still being developed

COMPUTER SCIENCE
   Specific objectives are still being developed

WEB SITE DEVELOPMENT AND ADMINISTRATION

After completing this program, students will be able to:
1. Demonstrate competency in programming languages commonly used in developing and servicing Internet web sites, both client-side and server-side
2. Develop applications capable of functioning over a distributed network
3. Demonstrate the significance of the client-server model to web page Programming
4. Demonstrate proficiency in developing complex web sites incorporating database driven technologies
5. Demonstrate and understanding of the limitations of bandwidth and the need for compression technologies
6. Select and use appropriate tools and resources for maintaining and administering an Internet web server
7. Demonstrate an awareness of the security implications for both the client and server in web communications, and employ appropriate security strategies
8. Identify and evaluate current industry trends

Certificates:
WEB SITE DEVELOPMENT AND ADMINISTRATION

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8. Identify and evaluate current industry trends

10. Complete the grid below by listing the majors, minors, and certificate programs from question #1 across the top row (and indicated by the example). Then, under each major, minor, and certificate program, place an “X” indicating which data collection methods are used to assess the extent to which the student learning outcomes are achieved (evidence that students know and can perform against the objectives).
Mark, where relevant, both “direct assessment methods” (efforts that directly evaluate student performance) and “indirect assessment methods” (efforts that evaluate student performance based on perception of student, alumni, etc.).

### Mathematics Majors

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<td>Direct Assessment</td>
<td>Crafts</td>
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<tr>
<td>Curriculum-Embedded Projects</td>
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<tr>
<td>Capstone Project Review</td>
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<tr>
<td>Portfolio Review</td>
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<tr>
<td>Reviews by External Evaluators</td>
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<tr>
<td>(e.g., intern supervisors)</td>
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<tr>
<td>Placement Test Scores</td>
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<tr>
<td>Performance on Post-Bac. Exams (e.g., GRE, GMAT, CPA)</td>
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<td>X</td>
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<tr>
<td>Other (describe:)</td>
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</tr>
<tr>
<td>Indirect Assessment</td>
<td>Exit Interview/Questionnaire</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Advisory Board</td>
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<tr>
<td>Alumni Survey</td>
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<td>X</td>
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<td>Other (describe:)</td>
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### Mathematics Minors/Certificates

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<td>Direct Assessment</td>
<td>Crafts</td>
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<td>X</td>
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<tr>
<td>Curriculum-Embedded Exams/Tests</td>
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<tr>
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<tr>
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<td>X</td>
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<tr>
<td>Other (describe:)</td>
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<td>Other (describe:)</td>
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### Computer Science Minors/Certificates

<table>
<thead>
<tr>
<th>Assessment Method</th>
<th>(Example)</th>
<th>Comp Sci Minor</th>
<th>Web Dev Minor</th>
<th>Web Dev Cert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Assessment</td>
<td>Crafts</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Curriculum-Embedded Exams/Tests</td>
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<td>X</td>
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<td>Curriculum-Embedded Essays</td>
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<td>X</td>
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</table>
Please list specific data/information sets relevant to the department's academic assessment efforts that the UW-W Self-Study Committees, and/or the Higher Learning Commission's Visiting Accreditation Team can access to review/consult.

- Praxis II scores for BSE Mathematics majors
- ETS Field Test Exam (Mathematics) data
- Exit Interview/Questionnaire data
- Math Fun Fair data

11. Indicate specific changes to the department's operation or planning, if any, that have resulted from the collection and use of the data/information identified in the preceding question. Place a check in the appropriate box in the far right hand column for any of the following changes that have occurred.

<table>
<thead>
<tr>
<th>Programmatic Changes</th>
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</thead>
<tbody>
<tr>
<td>Learning Outcomes (e.g., changes in what students should learn in the program)</td>
<td>X</td>
</tr>
<tr>
<td>Curriculum (e.g., revisions to sub-major, change in pre-requisites, addition of new courses, deletion or combining of coursework, changes in existing course content, etc.)</td>
<td>X</td>
</tr>
<tr>
<td>Scheduling (e.g., when courses are offered, etc.)</td>
<td>X</td>
</tr>
<tr>
<td>Departmental Procedure (e.g., changes in advising)</td>
<td>X</td>
</tr>
<tr>
<td>Instructional Methods (e.g., shift to hybrid courses)</td>
<td></td>
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<tr>
<td>Curriculum Delivery Methods (e.g., online programming)</td>
<td></td>
</tr>
<tr>
<td>Changes in Assessment Procedures (e.g., addition of specific assessments, creation of Advisory Board)</td>
<td>X</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
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</tbody>
</table>

In a paragraph, discuss your department's use of academic assessment data/information as chronicled in the table above. Discuss, in particular, how these changes have improved or stand to improve student learning.

The department initiated its academic assessment efforts in 1991 with an aggressive combination of embedded measures and portfolio review. This assessment process collapsed after a few years because it was too labor-intensive to maintain, and no further formal assessment efforts were conducted until 2002. During the 2002-2003 academic year the department engaged in a variety of assessment exercises to determine the fate of its space math and computer science emphases, resulting in the eliminations and simplification in program structure noted earlier. These changes have improved student learning by reducing...
the number of upper division classes that have had to be cancelled due to low enrollment. As a result, fewer students have had to use independent studies as a mechanism to complete courses that could not be scheduled and instead are able to take the course in a traditional classroom manner. At the same time, the department re-created its assessment committee, and charged it with formulating and implementing a simplified assessment process that could form the basis of our current future assessment efforts. Data from this revitalized process is being actively collected, but has not yet led directly to programmatic change.

12. In the box below, indicate the extent to which you think your department has fully implemented its academic assessment program, with 100% representing a fully-implemented program. Consider the extent to which the department has developed clearly stated learning outcomes, systematically collects data/information that informs the extent to which the outcomes are achieved, uses the data to make changes to the curriculum, etc.

40% to which academic assessment program is fully implemented

If you've indicated a percentage other than 100%, please list actions that remain to be completed before implementation of the assessment process is complete.

Formulate learning objectives for remaining program areas (see #9 above).
Align learning objectives of required/elective courses with objectives of program areas.
Align external assessment data with course and program objectives.
Clarify articulation of sequenced lower division courses, and align objectives with pre- and post-tests.
Fully incorporate assessment processes and data into department procedures.

If you've indicated a percentage less than 100%, what are the biggest obstacles to your department fully implementing its assessment program? Consider such items as: faculty and instructional staff involvement, time, budget, understanding of academic assessment and the process, etc.

The single greatest obstacle is time. Increased class sizes, increased course loads for academic staff, increased use of overloads to compensate for staff reductions, increased research expectations, and increased credits/per course for certain lower division courses have all placed additional demands on faculty time. The department still needs to develop an attitude that values formal assessment over past informal assessment practices, and time pressures make this difficult to address. Also contributing is a general lack of understanding by many members of the department of formal academic assessment and its processes. Even though the University has created many opportunities to inform the faculty about assessment, these often suffer when prioritized against other demands.

13. Describe any initiatives on behalf of your department (and its faculty) that have specifically promoted enhanced student understanding of issues related to diversity and inclusion.

None.

EXTERNAL CONSTITUENCIES

14. Describe in a paragraph or two your department’s relationships with constituencies external to the university (alums, employers or potential employers, advisory boards). What role, if any, have these groups played in (re)directing curriculum development specifically, and departmental planning generally?

The department has no formal connections with its alums other than through the UWW Alumni Center.
The department maintains informal connections with a variety of employers, and consults with them about program development, but has no formal mechanisms for this, and no advisory board serving in this role.
The primary informing relationships are within the discipline and its professional organizations. The department historically has relied on these organizations to suggest change rather than consulting other constituencies.

15. Does your department generally, or faculty or student groups specifically, offer special programming (e.g., non-credit workshops) or provide services (e.g., consulting services, project support) for constituencies external to the university?

   Yes  X  No

If “yes,” please provide a list of these initiatives and the constituencies they serve.
- Computer-related consulting to area businesses and families
- Mathematics consulting to area businesses
- Math-Awareness Month activities on and off campus
- Math Fun Fairs in area elementary schools
- National on-line high school mathematics meet.

16. Related to the preceding question, does the unit regularly collect data/information to evaluate how effectively it serves its constituency(ies)? (This might include surveys of constituencies.)

   Yes  No  X

If “yes,” please list specific data/information sets that the UW-W Self-Study Committees, and/or the Higher Learning Commission’s Visiting Accreditation Team can access to review/consult.

17. Does your department offer any service-learning courses, or do any of your faculty use service-learning as a teaching method?

   Yes  No  X

If “yes,” please list specific courses and faculty.

18. List and prioritize no more than three primary strengths that have emerged in your department’s efforts to meet its mission, goals, or objectives. To identify these strengths, you may wish to consider: What does your department do very well? What good things do people say about your department? How has your department aided the campus in meetings its mission? In what ways has your department “gone beyond the call of duty?”

SELF-EVALUATION

Strengths
After identifying each strength, specify supporting evidence that suggests that the statement is true. This may include data/information gathered relevant to departmental performance, trend data from the Office of the Registrar or Institutional Research, special recognition from external agencies, etc.

1. Specific Strength: Student satisfaction with instruction is high.
   - Supporting Evidence: Student evaluation of teaching data is consistently high for most faculty.

2. Specific Strength: Faculty involvement in research is increasing.
   - Supporting Evidence: Department annual reports show an ever-increasing number of scholarly publications and presentations, especially among newer faculty.

3. Specific Strength: The department is increasing its national and international exposure and recognition.
   - Supporting Evidence: The department sponsors and runs a national on-line high-school mathematics competition. Members of the department are responsible for, and serve on the editorial board of, two new mathematics journals, the Journal of Computational Mathematics and Optimization and the Journal of Applied Algebra and Discrete Structures. A member of the department organized an international mathematics conference this past year.

Concerns
19. List and prioritize no more than three primary concerns that have emerged in your department's efforts to meet its mission, goals, or objectives. To identify these concerns, you may wish to consider: What could be improved? What is done poorly? What do we, as a department, avoid doing, even though we know it's important?

After identifying each concern, specify supporting evidence that suggests that the statement is true. This may include data/information gathered relevant to departmental performance, trend data available from the Registrar or Institutional Research, information gathered from accreditation visit, etc.

Finally, identify one or more recommended actions to address the area of concern. This may include actions that your department has already underway, actions being planned, or preliminary thinking about how to address the area of concern.

1. Specific Concern: Assessment processes are inadequate.
   - Supporting Evidence: Data sets are small or missing; use of assessment data not yet natively incorporated into departmental processes; too great a reliance on anecdotal information.
   - Recommended Actions: See #12 above.

2. Specific Concern: Low success rates in remedial, proficiency, and lower division service courses. This affects overall university retention, as well as progression into the department’s majors and minors.
   - Supporting Evidence: D/F and repeat rates in these classes are consistently high.
• **Recommended Actions:** Continue to collect and analyze placement data to improve the appropriateness of placement for entering students. As discussed earlier, work to improve the articulation between sequenced lower division courses, collecting progression and assessment data to ensure that changes are evidence based. Continue to seek and implement best-practice techniques for these courses. Continue to consider viable alternatives for instruction that might offer improved student learning and success, utilizing progression and assessment data to validate these alternatives.

3. **Specific Concern:** The department’s mathematics education program is weak.

• **Supporting Evidence:** Lack of tenured or tenure-track faculty in this area, in spite of the fact that most of our majors are BSE students. Lack of faculty liaison with College of Education.

• **Recommended Actions:** Continue efforts to search for and hire qualified doctorates in this area. Develop formal liaison mechanisms with colleagues in education. Develop formal relationships with external stakeholders in this area.