Higher Learning Commission

Self-Study Questionnaire/Report for Stand-Alone Majors or Minors

Stand-Alone Major and/or Minor: Integrated Science Business

Individual(s) Completing the Questionnaire/Report: Steven W. Anderson

BACKGROUND INFORMATION

1. In a paragraph or two, overview the program(s), including an identification of the departments and courses that make-up the curriculum.

   The Integrated Science-Business Major (ISBM) combines the disciplines of science and business into an interdisciplinary program. Historically, graduate programs have been the domain for combining science and business and programs and are well established at a number of schools. Other academic education referenced as combining science and business has referred to attaining an MBA degree after an undergraduate degree in the sciences. An MBA does not actually combine science and business and although students with the B.S./MBA dual degree are in demand, generally they enter middle management. The focus of an integrated science-business undergraduate program is to develop integrated thinking from the initial stages of education and produce skilled graduates that are highly effective in entry-level positions requiring skills in both science and business. ISBM graduates will know more about business and management issues than a typical science or engineering graduate, and have a broader understanding of science and technology than most business majors. In the long term, the ISBM prepares students for careers as managers operating in technology-based industries.

   The ISBM provides a strong foundation in the sciences (32 units) as well as a basic background in business (33 units). Within these fields, students take 18-23 units of coursework that emphasizes particular science and business areas. At the end of the program, three capstone courses (Integrated Science Management, Integrated Science-Business Senior Project, and Integrated Science-Business Internship) serve to link these science and business understandings and prepare students for subsequent employment. Students in the ISBM program learn business management skills along with the principles of basic science involved in the development and management of products, services, and production processes utilized by a variety of technology-based institutions, organizations, and corporations. As a graduate of Whitewater's ISBM program you might work as a manager in charge of product or service planning in a science-based company, a director of research and development (R & D), a staff member at a private research institute or federally funded agency, a science investment consultant to a bank or trust company, or in a law, accountancy, or business consulting firm whose clients are science-based companies. Services to these clients could well go into the areas such as intellectual property, high-tech stocks and mutual funds, venture capital, and economic forecasting. Traditionally students of science and business have been educated separately. Today, technology impacts almost every aspect of society. In order to join tomorrow's workforce, graduates need to be versatile and adaptable. Managerial positions in technology-oriented industries require the integration and understanding of relevant scientific principles with basic management skills. The ISBM is designed to equip students to compete and prosper in the new technology-intensive, global market place.

   Program faculty and courses are derived from both the College of Letters and Sciences and the College of Business and Economics. The departments/programs specifically included in the Integrated Science and Business major are Accounting, Biological Sciences, Information Technology & Business Education, Chemistry, Economics, Finance and Business Law, Geology, Management, Marketing, and Physics. A steering group of four faculty from Biological Sciences, Chemistry, Management, and Marketing oversee and guide the program.

2. Provide the number of students (headcount) and number of individuals who have completed their degrees through your program during terms and years indicated.
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 answering 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).

8 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.

For the present number of majors (29), the human resources are completely sufficient. If the numbers should increase substantially (e.g., up to 40 majors) then release time should be provided for the Program Coordinator.

Physical Resources
Evaluate the adequacy of the physical resources available to support the program’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 office space, classroom space, supporting technology, lab space to support research and/or instruction, etc.

7 1-9

In a paragraph or two, discuss the physical 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.

Existing classrooms and laboratories are used for all program courses. These are more than adequate for instructional purposes. In particular, state-of-the-art facilities are now being
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).

9 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 met because of limitations.

The fiscal resources for the Program have been more than sufficient. Early support came through three grants from the Chancellor's Excellence Fund and a multiyear grant from the UW System. Recent support has been met by the generous assistance of former Dean Domitrz, Dean Clements (College of Business and Economics), and Dean Ross (College of Letters and Sciences).

4. In a paragraph or two, overview significant changes made to the program or its curriculum since 1996 (i.e., the last North Central Association Accreditation Visit).
Not applicable; this program was implemented for the first time in fall 2000.

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

MISSION & PLANNING
5. In a paragraph or two, describing any significant projects/initiatives that the program is planning or currently has underway, but has not yet completed.

The largest issue facing this Program is awareness to students, faculty, prospective students, industry, and the public at large. As such we have developed marketing plans.

1) Direct mail letter packages to Whitewater students (majors in general science, pre-business, and undeclared).
2) Posters to be hung throughout the dorms and other campus buildings for the school year.
3) Flyers to be distributed in dormitory mailboxes twice during this academic year.
4) Hire student help to conduct personal marketing (door-to-door, telephone, or e-mail) to contact other students and inform them of the program.
5) Revision of an already produced promotional video that will be placed on the ISBM website as a streaming video and also given to the Advising Center.

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 program (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>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment to the pursuit of knowledge and understanding</td>
<td>45</td>
</tr>
<tr>
<td>Development of the individual</td>
<td>25</td>
</tr>
<tr>
<td>Personal and professional integrity</td>
<td>10</td>
</tr>
<tr>
<td>Commitment to serve</td>
<td>10</td>
</tr>
<tr>
<td>---------------------</td>
<td>----</td>
</tr>
<tr>
<td>Commitment to develop a sense of community, respect for diversity, and global perspectives</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total=</strong></td>
<td><strong>100 points</strong></td>
</tr>
</tbody>
</table>
7. 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 program as it relates to the curriculum (i.e., take a hypothetical 100 points and distribute them among the planning variables, with those variables playing a larger role in the planning process receiving more points).

<table>
<thead>
<tr>
<th>Planning Variables</th>
<th>Importance (100 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mission of the University or the department</td>
<td>30</td>
</tr>
<tr>
<td>Academic assessment data/information relevant to student performance against learning outcomes</td>
<td>20</td>
</tr>
<tr>
<td>Other data/information gathered relevant to performance (e.g., Audit &amp; Review feedback)</td>
<td>20</td>
</tr>
<tr>
<td>Societal/Cultural trends (e.g., changes in demographics, lifestyles, professions)</td>
<td>5</td>
</tr>
<tr>
<td>Campus trends (e.g., changes in university-initiated needs and demands)</td>
<td>5</td>
</tr>
<tr>
<td>Technology trends (e.g., technology developments that affect delivery of service)</td>
<td>5</td>
</tr>
<tr>
<td>Professional trends (e.g., changes evident at other universities/colleges)</td>
<td>2</td>
</tr>
<tr>
<td>Available human resources (e.g., # of employees, talents, etc.) within the unit</td>
<td>2</td>
</tr>
<tr>
<td>Available financial resources (e.g., budget, available and accessible $)</td>
<td>5</td>
</tr>
<tr>
<td>Available physical resources (e.g., space, existing technology, etc.)</td>
<td>5</td>
</tr>
<tr>
<td>Other:</td>
<td>1</td>
</tr>
</tbody>
</table>

Total= 100 points

8. Does your stand-alone program 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.

We established a list of immediate and longer term goals a few years ago that essentially can be taken as a mission statement.

1. Establish our identity to customers (students, industry).
2. Generate enough students to offer the Science-Business Class on an annual basis.
3. Determine an appropriate target market (not just all high school students with a science background).
   a) via current ISBM majors
   b) similar students (industry, geographical location, business size, their “clients”).
   c) other??
4. Minimal cost effective advertising.
5. Generate enough students to keep the program going (~30-40 majors) to pass the 5 year Audit & Review.
6. Periodic updating of the advertising campaign to appropriately interface with the target market.
7. Expansion of the program into a web-based/international offering after we have established the classroom version.
8. Situate the program so that it is self-sustaining.
9. Attract technology related companies to be interested in providing science-business internships.
10. Attract technology related companies to be interested in providing science-business case studies.

If you answered “yes,” please describe how, if at all, this mission statement plays a role in your program’s planning and/or decision-making, particularly as it relates to the curriculum.
The number of majors in the program is critical in the offering of the Integrated Science Management course (SCIBUS 481). Since this is a case-based discussion course a reasonably large enrollment (12 or more) is needed for effective discussion. There have not been enough majors any given semester to make the offering feasible. As such we have directed students to other case-based courses in the Management or Marketing departments. While these courses do not focus with as much emphasis on science-business case studies they do provide students with an acceptable substitute until our student numbers take an upswing.

**STUDENT LEARNING & ASSESSMENT**

9. List all of the student learning outcomes for the program.

**ISBM STUDENT ASSESSMENT PLAN**

**Educational Objectives**

Upon graduation, ISBM students will have developed the following knowledge base, cognitive level, and skills:

**Subject Matter**

1. To include a knowledge base in at least two areas of science and one area of business beyond the business core requirements that is appropriate for a student's career goals. With the Integrated Science and Business major, students have a choice about which areas of emphasis to include in their program. An understanding of the major concepts, theories, and laws of each area is essential. (Assessment Techniques: 1,2,4,5)
2. To include knowledge of general laboratory and field techniques that are appropriate for disciplines. (Assessment Techniques: 1,2,4)
3. To include appropriate math background for a science and business education. (Assessment Technique: 1)
4. To include an understanding of how scientists and business managers work together during the various stages in the design, manufacture, and marketing of technologically related products and services. (Assessment Techniques: 1,6 – in particular, performance in the program capstone course, Integrated Science Management)
5. To include an understanding of the business and management structures of technologically-based companies, the management issues associated with Research and Development departments, and the process of marketing technologically oriented products. (Assessment Techniques: 1,4,6)

**Cognitive Development**

1. To include the ability to read and understand the appropriate scientific and business literature. (Assessment Techniques: 3,4,6)
2. To include the ability to integrate scientific and business information for effective analysis of problems and how to solve them. (Assessment Techniques: 1 - in particular, performance in the program capstone course, Integrated Science Management, 3,5)

**Skills**

1. To include the ability to present effective oral and written persuasive arguments in a business format. (Assessment Technique: 3)
2. To include the ability to develop an hypothesis, collect data, analyze data, and report the results. (Assessment Technique: 3)
3. To include the background to use a broad range of laboratory equipment. (Assessment Techniques: 1,3)
4. To include the understanding and use of safe procedural techniques and subsequent waste disposal. (Assessment Techniques: 1,3)
5. To include the ability to construct computer spreadsheets, to perform basic analysis of a business problem using the computer, and to use the library CD-ROM data bases to obtain specific information. (Assessment Technique: 1 - in particular, performance in the program capstone course, Integrated Science Management, 3,6)
Assessment Techniques

1. Progress of students through the program as developed in consultation with an advisor.
2. Exit interview and assessment of student employment success.
3. Successful completion of an internship and integrated science-business senior project, which will both require written and/or oral reports.
4. Survey of internship directors to assess their satisfaction with the level of knowledge possessed by our students.
5. Survey of alumni satisfaction with the program and subsequent career development.
6. Survey of employers to assess their satisfaction with the preparedness of our students and the quality of our program.

The information gathered during program assessment will be used to modify and improve the curriculum, internship opportunities, and capstone course content so as to better prepare majors for careers in firms operating in technologically based industries.

10. Complete the grid below by listing the 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.).

<table>
<thead>
<tr>
<th>Assessment Method</th>
<th>(Example)</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum-Embedded Exams/Tests</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Curriculum-Embedded Essays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum-Embedded Projects</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Capstone Project Review</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Portfolio Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviews by External Evaluators (e.g., intern supervisors)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Placement Test Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance on Post-Bac. Exams (e.g., GRE, GMAT, CPA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (describe:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exit Interview/Questionnaire</td>
<td>X</td>
<td></td>
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<tr>
<td>Advisory Board</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Alumni Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (describe:</td>
<td></td>
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</tbody>
</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.

- Projects from the Integrated Science Business Senior Project course.
- Minutes from Advisory Board Meetings.
- Exit interview transcripts.
- Internship employer evaluations of students.
11. Indicate specific changes to the program’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>
<th></th>
</tr>
</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 requirements, 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>X</td>
</tr>
<tr>
<td>Curriculum Delivery Methods (e.g., online programming)</td>
<td>X</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>X</td>
</tr>
</tbody>
</table>

In a paragraph, discuss the program’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.

Curricular action was taken to add Business Communication (BSEDCNA 353) as part of the major. We feel that our majors will gain practical benefits from this course as it is an upper division requirement for all majors within the College of Business and Economics. As for any graduate entering the marketplace, effective communication skills are of the utmost importance to be successful in any work environment. In addition, this course will better prepare students for the Integrated Science Management (SCIBUS 481) course, which is case discussion based and the Integrated Science Business Senior Project (SCIBUS 485) course, where students ultimately present and defend results of their research findings. The addition of Business Communication to the curriculum will also allow students to take Management 489 (Administrative Policy) should the Integrated Science Management course not be offered. This is case oriented and was the course that we replaced with our SCIBUS 481. Owing to a low number of majors in the program we have been unable to offer this capstone course since fall 2001. Until the numbers of majors are up, minimum enrollment will be a recurring problem.

Curricular action is also forthcoming to rectify a discrepancy in GPA admissions requirements for the BBA and BS programs. The BBA Science-Business majors have to meet a 2.80 GPA for admission to the major and to continue into upper level business classes, but the BS majors are admitted with the University default (2.00), may continue with a 2.50 and do not ever have to meet the 2.80 standard. The BS track will be changed to mirror that used for BS MCS majors whereby a 2.50 will be needed throughout the program.

We have allowed students to substitute Management 489 or Marketing 479 (Marketing Management & Policies) for SCIBUS 481 so they may graduate in a timely manner.

Based on early student input during advising sessions, two program courses (SCIBUS 485 – Internship and SCIBUS 493 – Senior Project) are now offered every summer in addition to the fall and spring semesters.

Revisions in advising check sheets have been made as a result of student input during advising sessions.

Our Advisory Board has made several recommendations. The following are planned for implementation: streaming marketing video on web, copy of video to campus advising center, utilize the annual UWW-Hawk Job Fair, publicize success stories of graduates, gather accurate placement data for graduates, place more emphasis on “job opportunities and recruiters”, use the WE Energies “Directory of Information Technology & Biomedical Companies” as a resource for internships and employment.

Exit interviews with graduating seniors have resulted in a consistent recommendation for greater interaction between program faculty and majors. Efforts at starting up a student organization faltered last year but are being renewed as of this writing.
12. In the box below, indicate the extent to which you think the program has fully implemented its academic assessment program, with 100% representing a fully-implemented program. Consider the extent to which the program 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.

66 % 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 the assessment program is fully implemented.

- alumni survey
- employer survey

If you've indicated a percentage less than 100%, what are the biggest obstacles to your program fully implementing its assessment program? Consider such items as: faculty and instructional staff involvement, time, budget, understanding of academic assessment and the process, etc. These will not take too much time. The alumni survey can be accomplished through the regular university web-based survey. Questions specific to the ISBM could be added. The employer survey could also be web-based with nominal costs supported by the Colleges.

13. Describe any unique initiatives on behalf of your program (and its faculty) that have specifically promoted enhanced student understanding of issues related to diversity and inclusion.
None have been addressed at this time.

EXTERNAL CONSTITUENCIES

14. Does your program 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.

- 
- 
- 
- 
- 
- 

SELF-EVALUATION

   Strengths

15. List and prioritize no more than three primary strengths that have emerged in your program's efforts to achieve its goals. To identify these strengths, you may wish to consider: What does your program do very well? What good things do people say about your program? How has your program aided the campus in meetings its mission? In what ways has your program “gone beyond the call of duty?”
After identifying each strength, specify **supporting evidence** that suggests that the statement is true. This may include data/information gathered relevant to program performance, trend data from the Office of the Registrar or Institutional Research, special recognition from external agencies, etc.

1. **Specific Strength:** Fills a niche for job qualifications.
   - **Supporting Evidence:** Increasing student enrollment and employer support.

2. **Specific Strength:** Flexibility in emphases in science and business.
   - **Supporting Evidence:** Inherent in the curriculum.

3. **Specific Strength:**
   - **Supporting Evidence:**

### Concerns

16. List and prioritize no more than three **primary concerns** that have emerged in your program’s efforts to meet its program’s goals. To identify these concerns, you may wish to consider: What could be improved? What is done poorly? What do we, as a program, 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 program has already underway, actions being planned, or preliminary thinking about how to address the area of concern.

1. **Specific Concern:** Ability to offer the capstone course, SCIBUS 481, Integrated Science Management.
   - **Supporting Evidence:** Relatively low program enrollment meaning an insufficient number of juniors and senior are in the pipeline.
   - **Recommended Actions:** Continue and implement program marketing measures. For example, direct mail letter packages are going to UWW majors in general science, pre-business, and undeclared.

2. **Specific Concern:** Connecting to the majors
   - **Supporting Evidence:** Majors only see their advisors on a regular basis seldom connecting with other ISBM students or faculty.
   - **Recommended Actions:** Periodic meetings between ISBM faculty and students.
   - **Formation of a student organization.**

3. **Specific Concern:**
• Supporting Evidence:

• Recommended Actions: