COLLEGE OF SCIENCE AND HEALTH

The College of Science and Health has developed an assessment plan designed to enhance student learning. It is comprised of the following objectives:

- **Objective 1:** To assist academic departments in developing valid measures of student learning outcomes, in developing assessment time lines and in using outcome data to enhance their programs
- **Objective 2:** To assess progress made toward the College's strategic goals of Undergraduate Student Research and Inquiry–Based Learning that were adopted in 1998
- **Objective 3:** To assess progress made toward the University mission of academic excellence
- **Objective 4:** To assess progress made toward the University mission of diversity
- **Objective 5:** To assess progress made toward the University mission of community outreach
- **Objective 6:** To assess student internships and field experiences
- **Objective 7:** To assess enrollment trends in the College (new admissions, present enrollment and retention)

Summary from the Dean's Year End Report to the Provost

All of the departments in the college are measuring student learning outcomes at the course and program levels. The College Assessment Committee, under the direction of David Slaymaker, has been working diligently to move the departments along on implementing their assessment plans.

Biology has a revised their assessment systems of evaluating course and program outcomes in both undergraduate and graduate programs. They have eliminated the student portfolios that attempted to document achievement of learning outcomes because they were not very feasible. They have administered the ETS Achievement Test in Biology for the past six years, and this long-term data has revealed several curricular areas that need attention. They administer a survey to senior students and to alumni and have received good data. The 2004 Alumni survey conducted by the University revealed that over 40% of responding Biology graduates and 33% of Biotechnology graduates are attending professional or graduate schools either full or part-time, the highest percentage of any program on campus!

The Chemistry/Physics Department assessed student achievement in two GE courses and one major course this year. They also have used the ETS exam in Chemistry as a measure of overall program outcomes for the past four years, and have now collected enough data for analysis to be done.

Community Health has conducted fewer assessments this year due to the magnitude of curricular changes mandated by their accreditation agency and because of work on the new BS in Applied Health program. However, they instituted a survey of Internship supervisors, and the results indicate that program outcomes are being achieved. They plan to conduct exit interviews with their graduating seniors next year. They modified the CMHL 120 course, Current Health Issues, based on assessment data from the past two years.

Communication Disorders has had to devise a system (mandated by ASHA) for assessing each individual student's achievement of student learning outcomes, in addition to assessing program outcomes. They send post-graduate surveys to recent graduates. They have added a focus on writing skills in their courses as a result of assessment data that revealed a weakness in this area. In response to alumni feedback and accreditation standards, they have also increased training in autism and augmentative communication. They had a 100% passing the Praxis Exam.

In Computer Science, a portfolio system has been put into place for every major course. A survey of graduating students was instituted last year. They have made significant changes to their courses based on assessment data. They have collected enough assessment data to be in a good position for their ABET accreditation visit in the fall.

Exercise and Movement Sciences has a well-rounded assessment program of measuring course and program outcomes and surveying their graduates. They had an overall 95% passing rate on their Praxis Exams.

Environmental Science focused on assessment of their GE courses this year. Their assessment plan needs to be updated.

Mathematics is measuring student learning outcomes in major courses and is assessing learning outcomes in GE courses such as MATH 110, 140, and 145. As a result of assessment of MATH 160,161, and 301 changes were made in course content. Also as a result of assessment, mandatory use of online resources was added to MATH 135, 140, and 145.

Nursing remains active in assessing their entire set of student learning outcomes every year. In addition, they have assessed the long term pattern of grades in entry level courses and in NCLEX exam scores (87% in 2004; 82% in 2005) and predictors of success for NCLEX. As a result of their assessment of NCLEX, they have begun using a different diagnostic pre-test exam and will begin administering an exit exam in 2008. They also purchase the EBI survey of student's assessment of their education which is benchmarked against five other schools.

The Departments of Community Health and Exercise and Movement Sciences developed and piloted a joint GE course that merges Current Health Issues and Fitness for Life. The course worked well for two semesters, and has now been approved as a permanent interdisciplinary course "Active Lifestyles for Health" that will meet the general education requirement. We continue to offer the interdisciplinary CSH 150, Integrated Science GE course, and the CSH 250 and 350 Integrated Research and Statistics courses.

Assessment plans and activities and annual summaries are listed below for each College of Science and Health department's programs.

Biology		
Goals	**Student Learning Outcomes**	**Assessment Methods**
Enhance critical thinking	Critically analyze biological information, including primary source material	Senior seminar or independent study paper
Develop the ability to collect, organize and evaluate scientific information	Organize and synthesize biological information into a logical sequence	Senior seminar or independent study paper
Develop the ability to make informed and ethical judgments concerning scientific issues	Discuss the necessity of integrity in science. Assess ethical issues in science	Senior seminar ethics paper; independent study paper
Develop an understanding of the paradigms & concepts of science, particularly biology	Integrate and critically analyze biological information	ETS major field test
Acquire the knowledge base of the diversity of living organisms through a study of the structure, function, behavior, and chemistry of living things	Acquire knowledge based on the four areas of modern biology: cell biology, molecular biology and genetics, organismal biology, and population biology/evolution and ecology.	ETS major field test
Enhance the ability to communicate effectively	Communicate clearly in an organized fashion the broad aspects of biology both in writing and orally	Writing: Senior seminar and independent study papers; oral presentations
Develop an historical and holistic perspective of science to understand current biological thought	Use information systems in the library to locate biological source material; organize and synthesize this information into a logical sequence	Senior seminar, or independent study papers; and oral presentations

Biology		
Goals	**Student Learning Outcomes**	**Assessment Methods**
Develop the ability to solve scientific problems	Demonstrate an understanding of the basics of experimental design: Interpret the data in primary scientific literature and draw valid conclusions from experiments	Senior seminar, or independent study papers
Develop the ability to reason quantitatively	Use graphs, charts, tables and other media to summarize and clarify information and data for oral and written presentations	Senior seminar or independent study; ETS major field tests
Develop library skills specific to biology. Develop the ability to reason quantitatively	Use information systems in the library to locate biological source material. Use graphs, charts, tables and other media to summarize and clarify information and data for oral and written presentations	Senior seminar or independent study papers and oral presentations; course senior seminar or independent study; ETS major field tests
Develop student involvement through experiential learning. Develop library skills specific to biology	Gather and analyze data; critically analyze biological information; organize and synthesize biological information into a logical sequence. Use information systems in the library to locate biological source material	Senior seminar or independent study paper and oral presentation

Biotechnology		
Goals	**Student Learning Outcomes**	**Assessment Methods**
Enhance critical thinking	Critically analyze biological information, including primary source material	Senior seminar or independent study paper
Develop the ability to collect, organize and evaluate scientific information	Organize and synthesize biological information into a logical sequence	Senior seminar or independent study paper
Develop the ability to make informed and ethical judgments concerning scientific issues	Discuss the necessity of integrity in science. Assess ethical issues in science	Senior seminar ethics paper; independent study paper
Develop an understanding of the paradigms & concepts of science, particularly biotechnology	Integrate and critically analyze biological information	ETS major field test
Acquire the knowledge base of the structure, function, and chemistry of cells	Acquire knowledge based on the following areas of biotechnology: cell biology, molecular biology and genetics.	ETS major field test
Enhance the ability to communicate effectively	Communicate clearly in an organized fashion the broad aspects of biotechnology both in writing and orally	Writing: senior seminar and independent study papers; oral presentations
Develop an historical and holistic perspective of science to understand current biological thought	Use information systems in the library to locate biological source material; organize and synthesize this information into a logical sequence	Senior seminar, or independent study papers; and oral presentations
Develop the ability to solve scientific problems	Demonstrate an understanding of the basics of experimental design: Interpret the data in primary scientific literature and draw valid conclusions from experiments	Senior seminar, or independent study papers
Develop the ability to reason quantitatively	Use graphs, charts, tables and other media to summarize and clarify information and data for oral and written presentations	Senior seminar or independent study; ETS major field tests
Develop library skills specific to biology. Develop the ability to reason quantitatively	Use information systems in the library to locate biological source material. Use graphs, charts, tables and other media to summarize and clarify information and data for oral and written presentations	Senior seminar or independent study papers and oral presentations; course senior seminar or independent study; ETS major field tests
Develop student involvement through experiential learning. Develop library skills specific to biology	Gather and analyze data; critically analyze biological information; organize and synthesize biological information into a logical sequence.	Senior seminar or independent study paper and oral presentation

Biotechnology		
Goals	**Student Learning Outcomes**	**Assessment Methods**
	Use information systems in the library to locate biological source material	

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Biology** faculty's assessment efforts focused on:

Finding assessment tools that can be added to the ETS major field exam given to seniors. To push this initiative forward the Biology Assessment Committee has agreed to pilot capstone and GE assessments in cooperation with the University-wide Learning Literacies Assessment Team. The team is also thinking of collaborating with the Office of Institutional Research and Assessment to add biology specific questions to the One Year Out Alumni survey that office does annually.

The faculty has also updated program student learning outcome objectives.

The following program improvements resulted from assessment efforts:

Optimizing the capstone course is in progress. Curriculum changes were made to support the ecology/evolution and organismal biology components of the curriculum that prior assessment results pointed to as needing revision.

Chemistry		
Goals	**Student Learning Outcomes**	**Assessment Methods**
1. Students gain knowledge of fundamental physical and chemical principles which provides them with a framework within which to understand a broad range of natural phenomena. They acquire skill in the use of scientific instrumentation, equipment and computers.	Ability to determine quantitative measures of reactants in a chemical reaction Ability to prepare solutions of known composition and concentration Ability to measure fundamental physical properties of solids, liquids, and gases, such as temperature, pressure, volume, density, melting point, boiling point, electrochemical potential, electrical conductivity, specific heat and heat capacity. Ability to explain the procedures and apparatus required to measure the heat of a chemical reaction. Ability to explain the procedures and apparatus required to measure the rate of a chemical reaction. Ability to use equilibrium constants to calculate equilibrium concentrations. Ability to describe the methods used to separate pure compounds from mixtures such as fractional distillations, chromatography, mass spectroscopy. Ability to identify classes of organic compounds by their functional groups and to	Student achievement and progress is assessed on the basis of semester and final examinations in each of the courses of the program Students achieve scores within the national norms on the American Chemical Society examinations in each of the areas of chemistry for which exams are provided Faculty reviews student performances on three examinations to determine changes needed to improve student performance.

Chemistry		
Goals	**Student Learning Outcomes**	**Assessment Methods**
	describe the mechanisms of common organic reactions. Ability to use physical and chemical techniques to identify pure organic compounds. Ability to isolate, identify, quantify and purify protein and DNA. Develop a working knowledge of enzymology and cloning. Understand the interrelationships between structure and function of macromolecules and cellular structures. Ability to explain the principles of operation and the area of application of Ultraviolet-visible, Infra-red, and nuclear magnetic resonance spectroscopy. Ability to correlate spectra with structural characteristics of molecules. Ability to use algebra, calculus and statistical analysis to solve scientific problems. Ability to use graphical techniques. Ability to use computers associated with laboratory instruments. Ability to use computers for data analysis and the preparation of reports.	
2. Students demonstrate the ability to organize data in the form of tables and graphics which they use to support conclusions acquired from the literature or data gathered from experimental work. They communicate their knowledge by writing reports and making oral presentations of their work.	Students keep detailed laboratory notebooks for each laboratory course required by the program. Students prepare laboratory reports on each experiment performed throughout the entire program. Students make an oral presentation of an investigation conducted as part of the CHEM 482 capstone course. Students write a term paper for the CHEM 320 (Inorganic Chemistry) and CHEM 427 (Biochemistry).	Students' portfolios contain laboratory notebooks and graded laboratory reports for all the required laboratory courses. Department faculty committee reviews the student portfolios to determine if students progress in achieving the program goals. Department faculty committee evaluates the student's oral presentation.
3. Students learn to initiate a lifelong personal pursuit of scientific knowledge and skills to enhance their professional career and provide personal fulfillment.	Students regularly attend science and technology seminars. Students attend American Chemical Society or similar society meetings Students demonstrate ability to initiate an experimental or theoretical investigation.	Student portfolios contain a listing of scientific seminars attended. Survey students five years after graduation for information on continued professional development. Students are required to initiate an experimental or theoretical study for the capstone course CHEM 482.

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Chemistry** faculty's assessment efforts focused on:

This year Chemistry accrued enough results (23) from the ETS field test to see if the majority of Goal 1's student learning outcomes are being met. Results are being tabulated by ETS and will be discussed by the faculty when received.
This past spring the research capstone course was assessed for the second time and data was combined with last spring's and will be analyzed in terms of meeting the outcomes of goal 3.
Course level assessments focused on CHEM 316--Physical Chemistry II and CHEM 051-- lab for Organic Chemistry. Students performed satisfactorily in the two objectives of CHEM 316 studied; 75% were able to derive mathematical relationships between physical quantities and calculate values of physical quantities from derived mathematical relationships
Students did not perform satisfactorily on the two SLOOs assessed in the lab course: ability to calculate % yield and ability to perform recrystallization. Faculty have begun conversations on how to address this.

Assessment outcomes of GE course PHYS110 met satisfactory levels

The following program and course improvements resulted from this year's assessment efforts:

The capstone course CHEM 482 was restructured to give students more opportunities and time to implement the program's student learning outcomes.

To address the deficiency in the ability to calculate % yields, faculty recommended the concept be stressed in subsequent courses that follow the general chemistry course. Adding more experiments that require this to the General Chemistry course's lab requirement was also discussed.

The lab manual is being rewritten to focus more on the importance of and concepts behind the techniques in each experiment where recrystallization is part of the procedures performed.

Even though learning outcomes were satisfactorily met in PHYS110 faculty suggested that further implementation of classroom demonstrations or additional lab exercises covering the SLOOS be considered.

Community Health		
Goals	**Student Learning Outcome**	**Assessment Methods**
	Assess health education needs	Conduct needs assessment Complete of Self-Assessed Health Education Competencies instrument National certified health education specialist examination
	Plan health education strategies, interventions and programs	Develop health education program plan Completion of Self-Assessed Health Education Competencies instrument National certified health education specialist examination
	Implement health education strategies, interventions, and programs	Plan implementation of health education program Completion of Self-Assessed Health Education Competencies instrument Implementation of health education program National certified health education specialist examination
	Conduct evaluations and research related to health education	Plan program evaluation Completion of Self-Assessed Health Education

Community Health		
Goals	**Student Learning Outcome**	**Assessment Methods**
		Competencies instrument Plan and carry out evaluation of health education program National certified health education specialist examination
	Administer health education strategies, interventions, and programs	Class discussion and examination Completion of Self-Assessed Health Education Competencies instrument Observation and internship supervisor report Completion of Self-Assessed Health Education Competencies instrument National certified health education specialist examination
	Serve as a health education resource person	Class discussion and examination Completion of Self-Assessed Health Education Competencies instrument Observation and internship supervisor report National certified health education specialist examination
	Communicate and advocate for health and health education	Class discussion and examination Completion of Self-Assessed Health Education Competencies instrument Observation and internship supervisor report National certified health education specialist examination

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Community Health** faculty's assessment efforts focused on:

The program served as a test site for the dissemination of the aggregate results for seniors taking the national certification exam based on 7 core areas of professional practice (our program serves as a test site for this NCHEC exam). The results were studied closely.

Over the last 6 years, the department also completed a full rotation of major course assessments and began emphasizing GE course assessment 2 years ago. A new course assessment tool for CMHL 220 Stress Management and student performance in CMHL 322 – Lifespan Nutrition were focused on this time around. The department worked on the results from the standardized set of exam questions across all sections of the GE course CMHL 120 Current Health Issues

The following program and course improvements resulted from this year's assessment efforts:

A review of the results of the national certification examination in health education noted that the area of greatest weakness was a content and skill area just added to the exam this past year. Therefore in fall 2008 a course that did not provide content or skills needed for professional practice and certification will be changed from a core course to a major elective and a course that addresses this deficiency will be added to the core.

For GE, based on assessment results of CMHL 120 Current Health Issues from 2005-2006, the department has systematically moved toward more standardization across sections of this GE requirement. This includes the implementation of core exam questions made this past year.

Computer Science				
Learning Outcome Objective	**How measured**	**When measured**	**Improvements Identified**	**Improvements Implemented**
Students will:				
Effectively express themselves in written and oral form.	• Alumni surveys. • Senior exit surveys. • CS480 capstone course (oral presentations and reports measured by the instructor).	• One-year after graduation. • Last semester before graduation. • Each time the course is taught.	• Students needed more practice with written and oral communication before taking CS 480.	• CS 341, CS 350, CS 345, and CS 382 were modified to include a report and oral presentations. • Oral presentations are also introduced in CS 260 and CS 342.
Demonstrate competence in mathematical skills	• Alumni surveys. • Course-based surveys and/or in class tests in CS260, CS372, and other core courses.	• One-year after graduation. • Each time the course is taught.	• Some deficiencies in College Algebra are observed in CS 260. • Some students have problems with the concept of big O and that of matrix algebra in CS 372.	• A review of College Algebra concepts needed in CS 260 is done at the beginning of the semester. Students are also required to attend tutoring sessions. • A review of matrix algebra is given in CS 372 and more emphasis is put on big O concept in CS 260.
Appreciate and be able to apply scientific methods in reasoning and problem solving.	• Alumni surveys. • Advisement sessions.	• One year after graduation. • Every semester.	• Students had problems to register into available science courses.	• The number of science elective courses has been increased.
Work effectively with others.	• Alumni surveys. • Senior exit surveys.	• One-year after graduation. • Last semester before graduation.	• Increase the number of group projects in the core.	• CS 341, CS 345, CS 350, CS 382 and CS 480 now have group projects.
Be able to do research (locate and make effective use of information).	• Alumni surveys. • Senior exit surveys. • CS480, capstone course (research projects and presentations measured by the instructor).	• One-year after graduation. • Last semester before graduation. • Each time the course is taught.	• Students need more research training and/or experience.	• A training session is now given by a librarian to students in the capstone course CS480 to familiarize them with the available library resources and the various Internet search techniques. • In CS 382, students are required to produce a report and make a presentation on a new programming language such as ASP, PHP, C#, Java, Perl, and Java Script.

Computer Science				
Use effective leadership skills.	• Alumni surveys. • Senior exit surveys.	• One year after graduation. • Last semester before graduation.	• Students need more work experience and internship.	• The department has multiplied efforts to find internship opportunities. • Students are recruited by the department to serve as system/lab administrator assistants or tutors/mentors. • We are also planning to make CS 490 a more active course.
Understand, select and apply algorithms and data structures.	• Course-based surveys and in class tests in CS 342 and CS 372. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students have problems with complexity analysis using big O, and with recursion.	• Supplemental materials are provided in CS 260 and students are encouraged to attend tutoring/mentoring sessions. • Review sessions are also conducted in CS 260, CS 342 and CS 372.
Select and apply appropriate programming language.	• Course-based surveys of CS 382. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students need an introduction to the different programming domains.	• The different programming domains are discussed in CS 382 along with the most appropriate programming language for each domain. The different programming paradigms are also discussed.
Understand programming language concepts.	• Course-based surveys of CS 382. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Some deficiencies in the characteristics of declarative programming languages are observed in CS 382.	• We now review the characteristics of declarative programming languages in CS 382.
Understand theoretical foundations of computer science concepts.	• Course-based surveys of CS 341, CS342, CS 372, and CS 382 • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students in CS 372 have little practical appreciation of computational complexity.	• We now do a verification of theory by experimental evidence in CS 372.
Be exposed to a variety of programming languages and systems.	• Course-based surveys of CS 382. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students need additional exposures to programming languages and systems.	• In CS 382, students are required to produce a report and make an oral

Computer Science				
				presentation on a new programming language such as ASP, PHP, C#, Java Script, Perl, and Java. • In CS 372, Java and/or Matlab is used for program implementations. • In CS 350, students are taught to model in UML (Unified Modeling Language) in the process of team project work. • Students are also required to complete C programming projects in the UNIX environment in CS 345.
Understand computer organization and architecture	• Course-based surveys of CS 280 and CS 341. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students need additional exposures to computer organization and architecture. • Students need additional exposures to modern design approaches	• An emphasis is put on the contents of datapath and memory system in CS341. • Computer performance evaluation and RISC architecture are introduced in CS280. • Introduction and use of VHDL to design projects in CS341.
Understand problem analysis and solution design principles	• Course-based surveys of CS 350. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students need more hands-on practice in software design.	• In CS 350, ArgoUML CASE tool (open software) is now used to capture the software specification and design.
Develop confidence to learn and apply new concepts.	• Alumni surveys. • • Senior exit surveys.	• One year after graduation. • Last semester before graduation.	• Have students do independent work before taking CS 480.	• In CS 345, students are required to produce a report and make an oral presentation on multimedia operating systems, multiple processor systems, security, or windows 2000, and in CS 382, they

Computer Science				
				are required to produce a report and make an oral presentation on a web application development language such as ASP, C#, PHP, Java Script, and Perl.
Understand ethical issues for computer science professionals.	• Course-based surveys of CS 480 and instructor evaluation of students' work. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students need to be introduced to ethical issues for computer science earlier in the curriculum before taking CS 480.	• We now discuss social and ethical issues as related to the responsibilities of producing quality software through Capability Maturity Model (CMM) and ISO 9000 Standards in CS 350.
Understand the impact of computing technology in society.	• Course-based surveys of CS 480 and instructor evaluation of students' work. • Senior exit surveys.	• Each time the course is taught. • Last semester before graduation.	• Students need to be introduced to the impact of computing technology in society earlier in the curriculum before taking CS 480.	• We now discuss social and ethical issues as related to the responsibilities of producing quality software through Capability Maturity Model (CMM) and ISO 9000 Standards in CS 350.

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Computer Science** faculty's assessment efforts focused on:

Addressing the ABET visiting team's concerns resulted in changes in the assessment process.

The following program and course improvements resulted from this year's assessment efforts:

Changes at the course and program level formally decided on since May 2007 are summarized in the table above along with the assessment tools and conclusions used to inform the changes. Not listed in the table is the department's efforts to offer more interesting and practical net-centric (internet-based) upper level CS electives in response to ABET recommendations.

Environmental Science		
Goals	**Student Learning Outcomes**	**Assessment Methods**
1. To provide Environmental Science majors with fundamental interdisciplinary science skills applied to scholarship and research in our natural environment, with particular emphasis on the development a holistic view of the environment.	1. Be able to integrate critical thinking skills and foundation knowledge from the fundamental sciences to the solution of environmental problems. 2. Be able to locate and use information, methods, and techniques related to physical environment and apply it to the solution of environmental problems.	Assessment instruments will be embedded in upper-level ENV courses to measure outcomes of foundation courses provided by other departments (CHEM, PHYS, BIO, MATH).
2. To provide students with a basic familiarity with human and Environment relationships, and the dynamics between them.	Understand the whole of the Earth/environment complex of processes and how humans can not only fit in harmony in the complex, but also can manage the Earth's environmental resources in a proper and sustainable manner.	Successful completion of a community, industry or government service component.
3. To provide Environmental Science majors with a comprehensive, focused curriculum which incorporates in-depth knowledge, research skills, laboratory and field techniques that ensure competency in a career as an environmental scientist.	1. The application of knowledge, research skills, laboratory methods and field techniques to environmental studies and related fields. 2. Ability to handle the field data using the tools in the digital ages. 3. Ability to collect, input, process, and analysis environmental data using research skills and laboratory and field techniques.	1. Lab exercises and class projects indicate students know how to collect field data, process, analysis, and present using the research skills and laboratory techniques. 2. Assignments, term paper, and examinations indicate students' knowledge, research skills and laboratory and field techniques. 3. Passing rate on the Standardize Exam which will be developed in the department.
4. To respond to the needs of the Environmental Science majors by providing them with the tools needed to pursue successful careers of all types and levels.	1. Students entering the program can complete all degree requirements in a reasonable period of time. 2. Work effectively with others in Environmental Science laboratories and other assignments.	1. Graduation rates. 2. Percentage of graduates employed in a profession or attending graduate school.
5. To provide students with communication skills that will lead to professional proficiency and leadership.	Students will acquire the oral and written communication skills required for entry into the profession.	Ratings of oral and written communication skills of graduates.

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Environmental Science** faculty's assessment efforts focused on:

The recommendations from the completion of the program review process in 2006/2007 were discussed in terms of course and program changes and improvements. An alumni survey was administered. In addition a faculty member attended an assessment conference and several additional assessment instruments were discussed.

The following program and course improvements resulted from this year's assessment efforts:

The program was reviewed and streamlined to focus courses on providing an appropriate course framework in which to serve both Environmental Science majors and those entering the new major in Earth Science program that begins this fall.

Kinesiology		
Goals	**Student Learning Outcomes**	**Assessment Methods**
Teach Students to communicate effectively in written and oral form	Construct and/or create written work and present information	Graded assignments: Lesson plans Written papers Oral reports Projects *Portfolio
Provide learning experiences that integrate technology into the curriculum	Use computers and other technology to acquire and communicate knowledge of course work – e.g., search on the internet, videotaping, use of PEAK system	Graded technological assignments
Prepare students for advanced study and lifelong learning in the Exercise and Movement Sciences profession	Use information/concepts/ Knowledge & apply it to their lifelong learning experiences- e.g.. graduate school	Alumni questionnaire P., N., A., tests
To promotes student excellence as future professionals	Participate in a wide variety of reflective practices that promote their creativity, stimulate their growth, contribute to acquisition of knowledge and practices, and enhance their professionalism	Alumni questionnaire Employer questionnaire *Portfolio P., N., A., tests
To teach students critical thinking skills	Analyze, summarize, and evaluate information and apply to profession and life	Critique speakers, articles, papers, studies, performances, evaluated by professor *Portfolio P., N., A., tests
To prepare students for productive citizenship as future Exercise and Movement Science professionals	Be involved in a physically active life style, promote lifelong physical activity and be community leaders in recreational and other institutions	Alumni questionnaire
To provide opportunities for student research	Describe, evaluate, and write/design research studies and apply results	Assigned and evaluated projects by professors
To provide opportunities for students to develop skills necessary to work effectively with diverse populations	Model and foster appropriate behavior and interaction in a multicultural society by demonstrating respect, valuing all people, having high standards, treating all fairly and with dignity	Evaluation by cooperating teacher, supervisor Employer questionnaire
To integrate general education knowledge into the Exercise and Movement Sciences curriculum	Apply knowledge, facts, concepts and principles from other academic disciplines to practices and outcomes in physical education	Written assignments Written tests Oral presentations *Portfolio **P., N., A., tests**
*P=PRAXIS (Teacher Certificate);N =National Athletic Trainers Assoc; A=Exercise Physiology		

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Exercise and Movement Science** faculty's assessment efforts focused on:

Assessing student work through e-portfolios, PRAXIS scores and supervisory reports from professors and field placement sites. As well faculty reviewed the new majors offered by the department, Athletic Training, to ensure it met CAATE accreditation standards and that the new Exercise Science meets NSCA guidelines.

The following program and course improvements resulted from this year's assessment efforts:

Two new majors were added to the department's undergraduate offerings. Both are following national accreditation standards that include assessment requirements.

Mathematics		
Goals	**Student Learning Outcomes**	**Assessment Methods**
Mission Statement (Revised in 2008) The Department of Mathematics of William Paterson University aspires to create an active, collaborative learning community where each member contributes to the learning of others. To develop such a community for learning, the department has an academically diversified faculty with specializations from many fields of mathematics. The main goal of the department is to prepare students for graduate studies, teaching career and other professional careers in mathematics through its major and minor programs. Students will be expected to • Understand the logic of mathematical thinking, • Understand the difference between conjecture and rigorous mathematical proof, • Use the language of mathematics to present precise descriptions and logical relationships • Develop an understanding of mathematics by studying underlying structures, relationships and operations, • Develop a repertoire of problem-solving techniques, • Develop mathematical skills and applications, • Develop skills to use technology for handling mathematical tasks. The department strives to develop competent, confident, enthusiastic majors who have a broad foundation in the study of mathematics and who can apply their skills and knowledge to a wide variety of theoretical and applied settings. Furthermore, the department is committed to the task of preparing students who are well equipped to face the challenges of complex technologically oriented 21st century.	Upon the completion of the core curriculum in mathematics, the student should be able to: 1. Analyze polynomial and transcendental functions of one or more variables. 2. Demonstrate an understanding of the concepts of derivatives and integrals and their applications in wide ranging problems. 3. Understand the fundamentals of vector space calculus. 4. Understand the theory and application of linear algebra. 5. Organize and synthesize mathematical information into logical proofs. Develop ability to analyze abstract arguments. 6. Understand the role that differential equations play in numerous real life applications. 7. Understand the concept of probability in theory and statistics in practice 8. Develop an understanding of theory of functions of real variables, metric spaces and various advanced properties associated with them. Upon the completion of the mathematics program, the student should also be able to (in addition to the above) : 1. Demonstrate quantitative literacy: a. Be able to analyze, interpret, and present data in a logical and scientific manner. b. Know basic counting methods, and basic knowledge of statistics and probability 2. Demonstrate an understanding of the principles and techniques of applying mathematics to real world problems: a. Use techniques of linear algebra and differential equations to solve various applied problems b. Understand the importance and widespread existence of nonlinear problems and the role of the linear theory in developing insight into these problems c. Grasp the concept of “dynamical” systems and their importance in comparison to “static” problems 3. Understand the role of the computer in mathematics by implementing and understanding the importance and limitations of algorithms for: a. Numerical methods for approximating integrals, series	Senior Capstone Seminar Evaluation of student’s project and presentation by their capstone/research faculty advisor Senior questionnaire Rating of teaching skills by the student teacher supervisors Employment rate for recent graduates

Mathematics		
Goals	**Student Learning Outcomes**	**Assessment Methods**
	and numbers b. Different methods for graphing continuous and discontinuous functions in two and three dimensions c. Numerical methods for approximating solutions of linear systems and differential equations 4. Communicate clearly and effectively in an organized fashion the basic concepts and principles of mathematics, from calculus to modern applications and theory: a. Communicate, in both oral and written fashion, mathematical concepts and methods in a precise manner b. Present historical perspectives and implications of mathematical ideas c. Understand research in mathematics by actively doing research in a specific area d. Analyze some application problems using modeling techniques to observe patterns, interconnections, and underlying structures	
		Senior Capstone Seminar Evaluation of student's project and presentation by their capstone/research faculty advisor Senior questionnaire Individual course assessments Rating of teaching skills by the student teacher supervisors Passing rate on the PRAXIS Exams Employment rate for recent graduates
		Senior Questionnaire Math Learning Center Tracking and report of students and logged hours
		Senior Capstone Seminar Evaluation of student's project and presentation by their capstone/research faculty advisor Senior Questionnaire Individual course assessments Rating of teaching skills by the student teacher supervisors Passing rate on the PRAXIS Exams Employment rate for recent graduates
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Mathematics		
Goals	**Student Learning Outcomes**	**Assessment Methods**
		capstone/research faculty advisor Senior Questionnaire Individual course assessments Rating of teaching skills by the student teacher supervisors Passing rate on the PRAXIS Exams Employment rate for recent graduates

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Mathematics** faculty's assessment efforts focused on:

Faculty focused on assessment in the capstone course. Data was reviewed to see how well SLOOS were met.

The following program and course improvements resulted from this year's assessment efforts:

Overall the data suggested that students are doing well, but two SLOOS with means below 3.5 were noted for improvement: student is able to make oral and written presentations in the language of mathematics and student is able to foster critical thinking and creative thinking. Solutions will be developed through faculty discussions.

Nursing		
Goals	**Student Learning Outcome**	**Assessment Methods**
To be prepared as a generalist professional nurse to meet the health care needs of diverse populations	Incorporate health promotion, illness prevention, health restoration and rehabilitation theory into nursing care strategies for diverse populations in a variety of institutional and community settings	Senior student clinical practice achievement Senior capstone course project 1 year out alumni survey Course evaluations by students Employer survey responses
To prepare a baccalaureate graduate with a strong knowledge base in the liberal arts and sciences and a broad foundation in nursing	Synthesize knowledge from the humanities, the natural and behavioral sciences and nursing in nursing practice decisions. Utilize effective oral and written communication skills to enhance nursing practice.	Senior year community/ population assessments Senior year clinical practice assignments re/patient care management National licensure examination Development of health care issue/project into formal paper and presentation to an appropriate audience in senior year Senior leadership paper 1 yr alumni survey/IR&A survey of graduates
To participate in socio-political processes collaborate with others to improve health care	Collaborate with consumers, health care team members and others to improve the delivery of health care.	Senior year Community Assessment Senior student clinical practice achievement Capstone course project 1 year alumni survey Employer survey responses
To process broad knowledge and skills in critical thinking, judgment and leadership	Apply the nursing process with individuals, families and groups to promote their adaptation Use nursing research findings to improve health care Employ leadership skills in professional nursing practice	Senior year patient care plans Senior student clinical practice achievement HESI Assess Test Course evaluations by students 1 Yr Alumni survey National professional licensure results

Nursing		
Goals	**Student Learning Outcome**	**Assessment Methods**
	Practice responsible and accountable professional nursing within the legal and ethical standards of the profession	Employer survey responses Research project in NUR 350 Senior Clinical application project in NUR 415. 1 Year Alumni survey NUR 322 term paper Senior year leadership experience in patient care management Employer survey responses Critical thinking paper
To incorporate rapidly changing technology into nursing of individuals, families and communities	Use information and technology to enhance professional nursing practice	Senior student clinical practice Senior capstone course project Senior leadership practice project 1 year alumni survey
To develop a desire for life-long learning	Participates in activities consistent with personal and professional development	Membership/participation in NJ Nursing Students Association Professional Practice Points 1 year alumni survey 5 year alumni survey

YEARLY UPDATE: Using Assessment Findings for Program Improvement

This year the **Nursing** faculty's assessment efforts focused on:

Nursing faculty have an extensive array of assessment tools that they review each year that they use to assure that the Nursing program continues to meet and exceed accreditation requirements.

The following program and course improvements resulted from this year's assessment efforts:

The program meets all accreditation standards.

Assessment of General Education Courses in the College of Science and Health

PHYS 110 While it was felt that students performed reasonable well on the SLOOs assessed in PHYS 110, it was none-the-less proposed that implementation of further classroom demonstrations or additional lab exercises covering the assessed topics be considered to strengthen the coverage of these particular area in the class.

CMHL 120 The Community Health department piloted implementation of standardized examination questions across sections in CMHL 120 Current Health Issues. The analysis of resulting data has allowed both optimization of the instrument and has identified the need for greater emphasis on specific aspects of course content.

Over the last 6 years, the department has completed a full rotation of major course assessments, and began emphasizing GE course assessment two years ago. The department's current assessment plan has a clear time-line for continued assessment at the course and program level.

For GE, based on assessment results of CMHL 120 Current Health Issues from 2005-2006, the department has systematically moved toward more standardization across sections of this GE requirement. This includes the implementation of core examination questions made this year which will help drive content standardization, as well as serve a valuable assessment function.

ENV-110 & 115 The department has emphasized GE assessment in previous years, developing a GE assessment plan and a course-embedded assessment instrument. This year there were extensive discussions about the effectiveness of the GE assessment plan and instrument.

No new changes to GE courses were made this year, but past changes have included a rock and mineral study web site developed as a cooperative project between the department and the Science Enrichment Center, and new lab manuals for both GE courses (ENV-110 & 115). A proposal to standardize grading across GE courses sections was also proposed.

Math 140 All 112 students in the GE course Math140 (Quantitative Math I) from four fall 2007 sections participated in an assessment study. Students were assessed on the following three content areas: i) Cost Revenue Applications, ii) Linear Programming Graphical Method, and iii) The Simplex Method. SLOOs were assessed by evaluating solutions to questions embedded on the final exam. The average for all three SLOOs was 72.4%, with a breakdown of Cost Revenue Applications (86.5%), Linear Programming Graphical Method (57.4%), and Simplex Method (71.4%). The linear programming graphical method problem was the least significant problem assessed, and the simplex method problem was the most significant with respect to the concepts and material that are central to the course. It was concluded that student performance was weakest on the linear programming graphical method problem because it introduces a new approach to solving problems and less time is spent on this topic in the course. Since students performed reasonably well on both of the more important content areas, it was concluded that the assessment results were satisfactory. These results will be presented to the department for further discussion and analysis.

A fall 2006 assessment of Math 111 showed that learning outcomes in this course were not being achieved. Furthermore, it was concluded that the course SLOO's did not closely correlate with the course curriculum, and that the final exam may not have been the best venue for proper and complete assessment of the course outcomes. Because of these results, and overall performance of students taking the Math110/Math111 sequence, the department has been working to make substantial changes to both Math 110 and Math 111. As of this year, the course content for both of these courses has been revised and new course outlines are being prepared to reflect the changes.