

FORENSIC SCIENCE

Graduate Program Assessment Annual Report

2006-2007

The public is uncertain about the value of higher education and wants evidence that college graduates do have the abilities claimed by their degrees. As a result our accrediting agencies, The North Central Association, the State Legislature, and the University System are requiring evidence of student learning (i.e., achievement of intended outcomes) and institutional effectiveness. Assessment at Marshall University has two important roles to fill: program improvement and accountability. MU=s assessment plan addresses both of those roles. In order for us to fulfill our commitment to program excellence, a yearly update of our assessment initiatives is essential.

Organization of the Report

The purpose of this annual report is to document the progress on assessing student outcomes based upon our program assessment plan. The objective is to determine program effectiveness, not evaluation of individual students or individual faculty. The primary focus of this report is to help to improve our program. The University Assessment Committee (UAC) will review the report, provide feedback on each program and prepare the annual assessment report of the University. This assessment information will be essential in preparing the 5-year program reviews required by the BOT. It is imperative that each program be honest in its assessment efforts and in the preparation of this report. Only with careful scrutiny of our programs can we hope to improve.

I. Assessment Activities

A. Program Goals

The Forensic Science Graduate Program strives to provide students with a one-of-a-kind educational experience that includes a broad-based core forensic science curriculum that prepares students to enter the field of forensic science beyond the entry level of practice. National accreditation acknowledges that the Program produces competent individuals who have met established educational standards recognized by the profession. Accreditation also ensures that instructors and program administrators participate in self-evaluation and professional development which serves to improve the Program. The Program currently offers 3 areas of emphasis that include DNA Analysis, Computer Forensics, and Forensic Chemistry. A fourth area of emphasis was recently approved by faculty in Crime Scene Investigation. Students are given the opportunity to complete one or more areas of emphasis. Providing multiple areas of emphasis, enhances student opportunities to successfully secure highly competitive, and sought after, positions in the field. This science-based curriculum coupled with a strong research focus prepares students for successful careers in forensic science as special agents, consultants, technical leaders, trainers and analysts demonstrated by a high placement rate for internships and employment. The Program focuses on the development of strong written and communication skills in preparation for roles as laboratory managers and directors, expert witnesses, trainers, educators, and life-long learners. Professionalism, quality control and quality assurance, safety, and ethics are emphasized and practiced

throughout the curriculum. More information regarding the academic program may be found at <http://forensics.marshall.edu> and following the link to Master of Science Degree Program.

The Forensic Science Program strives to:

- Provide affordable, high quality graduate education appropriate for the state, region, and nation. [*A particularly high “special” fee structure identifies this Program as the most costly forensic science program in the nation regarding fees. Although we have been very successful in attracting highly-qualified students from across the country, the high fee structure continues to contribute to a dwindling applicant pool. A large percentage of students constituting our student body (~ 85%) are non-residents who pay proportionately higher fees.*]
- Provide services and resources to promote student learning, retention, and academic success. [*No change.*]
- Foster faculty, staff, and student outreach through service activities. [*No change. Comments: Service to the forensic science community through National Institute Justice programs is a hallmark of this academic program. Particularly noteworthy are two nationally recognized programs, the National Expert Systems Test-bed and the Technical Assistance Program, who recognize and value the knowledge, skills, and professional attitudes of our students. These programs, and others, provide students with exceptional learning experiences and exposure to various forensic science working groups and professionals from across the country.*]
- Provide a safe and secure work environment. [*No change. Students participate in annual biological and chemical safety programs based on OSHA guidelines. A successful background check is required to enroll in the Program. Hepatitis B vaccination, or signed waiver, is required to continue in the program.*]
- Make instruction available throughout the Forensic Science Program’s service area using all appropriate modes of delivery. [*No change. Comments: We provide distance-education to the West Virginia State Police and other crime laboratories having compatible technology.*]
- Assist the West Virginia State Police in areas of education, training, and certification. [*No change. Comments: We are currently working toward the development of a certification program in one of our areas of emphasis.*]
- Promote economic development through research and service. [*No change. Comments: Students are involved in a number of research and economic development initiatives including the Mortuary Project, Bacterial Source Tracking Project, Gasoline Project, Smokeless Powders Project, Pollen Project, as well as internal*]

validation studies to enhance the efficiency of the working DNA service laboratory].

- Educate a citizenry capable of living and working effectively in a global environment. [No change.]
- Support and strengthen the faculty, staff, student, and administrative governance structures in order to promote growth and development of the Program and the institution. [No change. *Comments: As the Academic Program and the Center grow, additional faculty and laboratory space are needed to remain competitive, to maintain our reputation of excellence, and to continue to attract new funding opportunities.*]

Forensic Science Faculty strives to:

- Remain current in their fields of expertise and incorporate that expertise in the educational process as appropriate. [No change.]
- Improve instruction through the use of innovative teaching methods that require students to become actively involved in the learning process and develop the critical thinking skills necessary for life-long learning. [No change.]
- Contribute to the body of knowledge through completion of scholarly and creative activities. [No change.]
- Actively engage and mentor students in scholarly, artistic, and creative endeavors. [No change.]
- Help students develop the ability to navigate through a rapidly changing technology and societal expectations. [No change.]
- Regularly review the curriculum, degree(s), and areas of emphasis offered, and recommend necessary additions and deletions to meet changing needs of the state, region, and nation. [No change.]

Forensic Science Students strive to:

- Contribute to their community through use of their knowledge, creativity, and critical thinking skills. [No change. *Comments: The graduates of this program enjoy a ~100% employment rate in their chosen area of interest.*]
- Undertake intensive graduate-level education in forensic science upon admission to the graduate school, giving them solid foundations for becoming competent professionals. [No change.]

Forensic Science Administration strives to:

- Actively seek resources to support the mission and goals of the Forensic Science Program. [No change.]
- Secure funding to support scholarship and creative endeavors, faculty and staff development, and state-of-the-art classrooms and educational opportunities. [No change.]
- Provide leadership to facilitate the Program's achievement of its mission and vision. [No change.]

- Administer the policies of the Program in a fair, ethical, and equitable manner. *[No change.]*
- Communicate the vision, mission, goals, achievements, and difficulties of the Program in a clear, effective, and forthright manner to both internal and external constituencies. *[No change.]*
- Actively support shared governance of the institution. *[No change.]*

B. Student Learning Outcomes & Data Collection

1. Demonstration of Effective Written and Oral Communication Skills

Activities and documented outcomes include:

- a) Seminar presentations (1 presentation per year) hosted on-site with broadcast to the WV State Police Crime Laboratory – See Seminar Presentation rubric 1) Seminar Research Rubric and 2) Seminar Lay Audience Rubric. Students are expected to achieve a B or better.
- b) Poster presentation at local (required), regional (optional but encouraged), and national meetings (optional but encouraged) – See Poster Presentation Rubric. Students are expected to achieve a B or better.
- c) Research-based scientific writing – See Research-Based Scientific Writing Rubric. Students are expected to achieve a B or better.
- d) Independent study demonstrates the student’s ability to work with minimal supervision to accomplish established goals and objectives – See Critique of Independent Study Reports. Students are expected to achieve a B or better.

2. Demonstration of Appropriate-Level Knowledge, Laboratory Skills and Attitudes/Behaviors.

Activities and documented outcomes include:

- a) Mastery of course content (cognitive domain - predominantly) – The student is expected to achieve a grade of B or better in all required coursework. Grades are determined through administration of objective and subjective course examinations. Exams are maintained for FEPAC (Forensic Science Education Program Accreditation Committee of the American Academy of Forensic Science; <http://www.aafs.org>) review along with course syllabi, evaluations, instructor CV and faculty data sheet, and course-associated course materials.
- b) Assessment of Laboratory-based knowledge, psychomotor skills, and attitudes/behaviors (affective domain – predominantly) – See Knowledge, Skills, and Attitudes/Behaviors Rubric utilized for internal and

external laboratory-based student assessments.

Students are expected to achieve a B or better.

- c) External Comprehensive Evaluation: American Board of Criminalistics's (ABC; <http://www.criminalistics.com>) Forensic Science Aptitude Test (FSAT). As with other national certifications, participation is voluntary.
- d) Internal Comprehensive Evaluation: Marshall University Comprehensive Examination. The student is expected to achieve a grade of C or better on each section of the examination with an overall average of B or better to graduate. This is a day-long, 7-section examination administered in the last term of the program.

II. Measuring Instruments

1. Program Instruments (See attachments)

- Instrument A: Oral & Written Communication Skills – 1) Seminar Presentation of Research Rubric; 2) Seminar Presentation to a Lay Audience Rubric
- Instrument B: Oral & Written Communication Skills – Poster Presentation Rubric
- Instrument C: Scientific Writing Skills – 1) Research-based Scientific Writing Rubric; 2) Critique of Independent Study Reports
- Instrument D: Laboratory-based Knowledge, Skills, Attitudes & Behaviors Rubric
- Instrument E: Internal Comprehensive Examination
- Instrument F: American Board of Criminalistics Forensic Science Aptitude Test

III. Learning Outcomes

Students performed within the established assessment standards based on numerous external and internal evaluations. In addition, students were selected, and therefore recognized, by forensic science professional organizations to deliver oral and poster presentations at regional and national meetings. For the first time, our students elected to take a national board examination offered by the American Board of Criminalistics. Among 8 universities, Marshall University's Forensic Science Program ranked first in overall scoring. While our information is currently incomplete, we do know that two of our students ranked first and second among all test-takers, in overall scoring.

Plans for the Current Year

As a nationally accredited Forensic Science Program, the Program's mission, goals, and objectives are assessed throughout the year. In previous year, more than 10 assessment instruments have been used to demonstrate student progress toward achieving goals prescribed by our accrediting agency. With guidance from the Assessment Office we will continue to develop new, and improve existing, assessment instrument and look forward to the analysis of our findings. The rubrics developed this year will serve to provide the program with new and improved quantifiable program assessment information to facilitate program improvement. Students will also benefit this coming year by having improved guidance and feedback to aid in improving their progress and success in achieving program-established goals and objectives.

What have we learned from this process? Participation in the Assessment Program allows forensic science instructors and program administrators to participate in an on-going evaluation process designed to facilitate program improvements. Success in meeting and exceeding our goals, while also identifying areas of weakness, serves to document the program's ability to effectively produce competent individuals when they have clearly met well-defined benchmarks with respect to cognitive, affective, and psychomotor skills. Clearly defined objectives, and the associated instruments to measure those learning activities and behaviors, benefits the instructor, as well as the student. Students benefit by having a clearer understanding of what is expected and their position on the learning curve. Instructors benefit by having a standardized means of grading, as well as having a standardized means for evaluating the students' progress that fosters better communication and learning.

INSTRUMENT A.1
ORAL SEMINAR PRESENTATION OF RESEARCH

Course _____ Presenter _____ Date _____

**Scantron Key: Based on the score achieved in each row, complete the Scantron form as follows:
0 = D; 1 = C; 2 = B; 3 = A**

	Criteria	0	1	2	3	Score
	Nonverbal Skills					N/A
1	Eye Contact	Does not attempt to look at audience at all, reads notes the entire time	Only focuses attention to one particular part of the class, does not scan audience	Occasionally looks at someone or some groups during presentation	Constantly looks at someone or some groups at all times	
2	Facial Expressions	Has either a deadpan expression or shows a conflicting expression during entire presentation	Occasionally displays both a deadpan and conflicting expression during presentation	Occasionally demonstrates either a deadpan OR conflicting expression during presentation	Gives audience clues to what the content of speech is about; Appropriate expression, never notice a deadpan or conflicting expression	
3	Gestures	No gestures are noticed			Natural hand gestures are demonstrated	
4	Posture	Sits during presentation or slumps		Occasionally slumps during presentation	Stands up straight with both feet on the ground.	
	Vocal Skills					N/A
5	Enthusiasm	Shows absolutely no interest in topic presented	Shows some negativity toward topic presented	Occasionally shows positive feelings about topic	Demonstrates a strong positive feeling about topic during entire presentation	
6	Vocalized Pauses (uh, well uh, um)	10 or more are noticed	6-9 are noticed	1-5 are noticed	No vocalized pauses noticed	
	Content					N/A
7	Title	Audience has no idea what the presentation is on		Vaguely tells audience what presentation is over	Clearly describes what the presentation is covering	
8	Time frame	Presentation is less than minimum time	Presentation is more than maximum time		Presentation falls within required time frame	
9	Graphics	Poor, distracts audience and	Adds nothing to presentation	Thoughts articulated	Graphics enhances presentation, all	

		is hard to read		clearly, but not engaging	thoughts articulated and keeps interest	
10	Completeness of Content	One or more points left out	Majority of points glossed over	Majority of points covered in depth, some points glossed over	Thoroughly explains all points	
11	Professionalism of Presentation	Mumbles, audience has difficulty hearing, confusing	Thoughts don't flow, not clear, does not engage audience	Thoughts articulated clearly, though does not engage audience	Presentation is organized and the interest level of the audience is maintained	
12	Introduction	Did not clearly address the purpose in opening remarks	Vaguely addressed the purpose in opening remarks	Most, but not all important purposes were addressed in opening remarks	Clearly summarized the purpose in opening remarks	
13	Abstract	Abstract contained grammatical, spelling, or errors in scientific notation. Less than 50 or more than 120 words.	Major points within the abstract are missing such as the purpose, approach taken, major findings, conclusions and future directions.	Some, but not all, major points were addressed.	All major points were addressed to include the purpose, approach taken, major findings, conclusions, and future directions.	
14	References	Less than 3 references are listed from peer-reviewed journals or within the past 5 years	3 references are listed from peer-reviewed journals or within the past 5 years	4 references are listed from peer-reviewed journals or within the past 5 years	5 or more references are listed from peer-reviewed journals or within the past 5 years	
15	Discussion & Conclusions	Discussion section missing or not discussed	Results not tied back to original hypothesis or question investigated	Minimal linkage to original hypothesis or question or new questions or direction not presented	Results are clearly tied back to original hypothesis or question with new questions or directions presented	
16	Acknowledgements	None present	Present but incomplete		Supervisor(s) and faculty are acknowledged	

Evaluator (Print) _____ Evaluator (Signature) _____

Overall Interpretation

A = Excellent performance; 43 – 48 points

B = Average to good performance; 38 – 42 points

C = Needs improvement; requires documented improvement to receive a B or better; 33-37 points

D = Unacceptable; repeat performance required until a grade of B or better is achieved; < 33 points

Course _____

Presenter _____

Date _____

Evaluator _____

Comments & Recommendations:

Action Plan:

Follow-up:

INSTRUMENT A.2 SEMINAR PRESENTATION TO LAY AUDIENCE

Course _____ Presenter _____ Date _____

Scantron Key: Based on the score achieved, complete the Scantron form as follows:

0 = D 1 = C 2 = B 3 = A

ORAL SEMINAR PRESENTATION – LAY AUDIENCE

	Criteria	0	1	2	3	Score
	Nonverbal Skills					N/A
1	Eye Contact	Does not attempt to look at audience at all, reads notes the entire time	Only focuses attention to one particular part of the class, does not scan audience	Occasionally looks at someone or some groups during presentation	Constantly looks at someone or some groups at all times	
2	Facial Expressions	Has either a deadpan expression of shows a conflicting expression during entire presentation	Occasionally displays both a deadpan and conflicting expression during presentation	Occasionally demonstrates either a deadpan OR conflicting expression during presentation	Gives audience clues to what the content of speech is about; Appropriate expression, never notice a deadpan or conflicting expression	
3	Gestures	No gestures are notices			Natural hand gestures are demonstrated	
4	Posture	Sits during presentation or slumps		Occasionally slums during presentation	Stands up straight with both feet on the ground.	
	Vocal Skills					N/A
5	Enthusiasm	Shows absolutely no interest in topic presented	Shows some negativity toward topic presented	Occasionally shows positive feelings about topic	Demonstrates a strong positive feeling about topic during entire presentation	
6	Vocalized Pauses (uh, well uh, um)	10 or more are noticed	6-9 are noticed	1-5 are noticed	No vocalized pauses noticed	
	Content					N/A
7	Title	Audience has no idea what the presentation is on		Vaguely tells audience what presentation is over	Clearly describes what the presentation is covering	
8	Time frame	Presentation is less than minimum time	Presentation is more than maximum time		Presentation falls within required time frame	
9	Graphics	Poor, distracts audience and is hard to read	Adds nothing to presentation	Thoughts articulated clearly, but not engaging	Graphics enhances presentation, all thoughts articulated and keeps interest	

10	Completeness of Content	One or more points left out	Majority of points glossed over	Majority of points covered in depth, some points glossed over	Thoroughly explains all points	
11	Professionalism of Presentation	Mumbles, audience has difficulty hearing, confusing	Thoughts don't flow, not clear, does not engage audience	Thoughts articulated clearly, though does not engage audience	Presentation is organized and the interest level of the audience is maintained	

Evaluator (Print) _____ Evaluator (Signature) _____

Overall Interpretation

A = Excellent

B = Good

C = Average; needs improvement

D = Unacceptable

Course _____

Presenter _____

Date _____

Comments & Recommendations:

Action Plan:

Follow-up:

Marshall University
Assessment of Student Outcomes: Component/Course/Program Level

Component Area/Program/Discipline: GM 60 FORENSIC SCIENCE

YEAR: ACADEMIC YEAR 2006-07

Component / Course / Program Level					
Student Outcome	Person or Office Responsible	Assessment Tool or Approach	Standards/Benchmark	Results/Analysis	Action Taken
Demonstrates Effective Communication Skills with Effective Use of PowerPoint Slides for a Specialized Audience	Pamela Staton	Rubric A.1 Oral Seminar Presentation of Research	See Rubric	Rubric is new which will be implemented in 2008 - 09	
Demonstrates Effective Communication Skills with Effective Use of PowerPoint Slides for the Lay Audience	Pamela Staton	Rubric A.2 Seminar Presentation to Lay Audience	See Rubric	Rubric is new which will be implemented in 2008-09	
Demonstrates Effective Oral and Written Communication Skills in a Poster Presentation Format	Pamela Staton	Rubric B Poster Presentation	See Rubric	Rubric is new which will be implemented in 2008 - 09	
Demonstrates Effective Scientific Writing Skills suitable for Publication	Pamela Staton	Rubric C.1 Research Paper	See Rubric	Rubric is new which will be implemented in 2008 - 09	

December 18, 2007 (4:05PM)

C:\Documents and Settings\barker28\Local Settings\Temporary Internet Files\Content.Outlook\P122R92H\Forensic Science 2006 07 Student Outcomes Chart.doc

Form borrowed in part from Oakton Community College, Des Plaines, IL 60016

Prepared by the Office of Program Review and Assessment, Office of Academic Affairs, Marshall University, Huntington, WV 25755-2003

Marshall University
Assessment of Student Outcomes: Component/Course/Program Level

Component Area/Program/Discipline: GM 60 FORENSIC SCIENCE YEAR: ACADEMIC YEAR 2006-07

Component / Course / Program Level					
Student Outcome	Person or Office Responsible	Assessment Tool or Approach	Standards/Benchmark	Results/Analysis	Action Taken
Demonstrates Effective Abilities to Work Independently on a Specified Forensic Chemistry Project	Graham Rankin	Instrument C.2 Criteria for Grading Independent Study for Forensic Chemistry Emphasis	See Assessment Instrument	Students achieved an A or B in 2006-07	
Demonstrates Laboratory-based Knowledge, Skills, Attitudes, and Behaviors Assessed by an External Agency Reviewer	Pamela Staton	Rubric D Knowledge, Skills, Attitudes & Behaviors	See Rubric	Rubric is new which will be implemented in 2008	
Demonstrates Cognitive Abilities as determined by a National Certification Agency	Pamela Staton	American Board of Criminalistics Forensic Science Aptitude Test	See Instrument E Report	Program performed first among 8 universities.	We will continue to encourage students to participate in national certification programs.
Demonstrates Appropriate Cognitive and Affective Skills in a Classroom Setting	Terry Fenger Pamela Staton Graham Rankin Catherine Rushton Bryan Brubaker Yulia Dementieva Peggy Brown	Course Examinations	B or better in all required courses; maintenance of a 3.0 GPA with no more than 2 grades of C overall.	No student made less than a C in any course. One student (out of 40) dropped below a 3.0 GPA.	One student below a 3.0 was placed on academic probation.

December 18, 2007 (4:05PM)

C:\Documents and Settings\barker28\Local Settings\Temporary Internet Files\Content.Outlook\P122R92H\Forensic Science 2006 07 Student Outcomes Chart.doc
 Form borrowed in part from Oakton Community College, Des Plaines, IL 60016

Prepared by the Office of Program Review and Assessment, Office of Academic Affairs, Marshall University, Huntington, WV 25755-2003

Marshall University
Assessment of Student Outcomes: Component/Course/Program Level

Component Area/Program/Discipline: GM 60 FORENSIC SCIENCE YEAR: ACADEMIC YEAR 2006-07

Component / Course / Program Level					
Student Outcome	Person or Office Responsible	Assessment Tool or Approach	Standards/Benchmark	Results/Analysis	Action Taken
Mastery of Comprehensive Knowledge of Forensic Science	Terry Fenger Graham Rankin Catherine Rushton Bryan Brubaker Peggy Brown	Forensic Science Comprehensive Examination	70% score or better	All students passed the comprehensive examination for 2007.	The examination will be modified to reflect updated material.

Instructions: Under student outcomes (Column I) please list the most current student outcomes/competencies to be demonstrated by your graduates. These should be in your assessment plan.

(Column II) Person/office responsible: If someone specific has been designated to collect the various pieces of evidence, please list their names in this column.

(Column III) Assessment Tool or Approach: Here you will need to designate the assessment measures you are using to assess the particular outcome. Measures/tools may include term papers, parts of essay tests, internship results; class projects; objective tests; standardized/normed or other licensure tests, or a variety of other measures that may indicate competence in a particular objective.

(Column IV) Standards/Benchmark: Here you may indicate a particular set of standards you have set for completion or if you are developing benchmarks, please indicate what those are. If you are using a national test, what are the indicators of competence.

(Column V) Results/Analysis: Indicate what the results were utilizing the assessment tool/measure and applying it against the benchmarks set. Please be fairly specific here, provide relevant data and a brief analysis.

(Column VI) Action Taken: Indicate any action taken based on the results/analysis you have completed.

PLEASE REMEMBER: Not all objectives have to be measured every semester or every year. All of your objectives should be measured in a 2 to 3 year cycle. Sometimes it depends on when particular courses are offered as to when objectives can be measured. A helpful tool may be implementation of the courses/objective matrix. Some programs have completed this some have not. If you are interested in completing one for your program, please let me know and this office will supply you with the forms and assist in completing this document.

December 18, 2007 (4:05PM)

C:\Documents and Settings\barker28\Local Settings\Temporary Internet Files\Content.Outlook\P122R92H\Forensic Science 2006 07 Student Outcomes Chart.doc
 Form borrowed in part from Oakton Community College, Des Plaines, IL 60016

Prepared by the Office of Program Review and Assessment, Office of Academic Affairs, Marshall University, Huntington, WV 25755-2003