

Annual Biomedical Sciences Program Assessment Report for the Academic Year 2010-2011

I. Program Mission

The mission of the Biomedical Sciences (BMS) Research M.S./Ph.D. program is to produce graduates who have broad didactic knowledge in the biomedical sciences, but also have specialized research training in one of our five interdisciplinary research clusters: Cancer Biology; Cardiovascular Disease, Obesity, and Diabetes; Infectious and Immunological Diseases; Neuroscience and Developmental Biology; Toxicology and Environmental Health Sciences.

The mission of the M.S. Medical Sciences area of emphasis is to provide an opportunity for students to enhance their competitiveness for admission to medical school. This increases the pool of qualified applicants to the Marshall University Joan C. Edwards School of Medicine.

These support the mission of Marshall University by providing high quality graduate education for the state and region, enhancing the quality of health care in the region, promote economic development through research, educating a citizenry capable of living and working effectively in a global environment, and furthering the intellectual life of the community and region.

II. Program's Student Learning Outcomes

We have identified five student outcomes important to the Biomedical Sciences Program.

1. Mastery of basic knowledge of biochemistry, cellular biology, and molecular biology.
2. Mastery of communicating research results to a professional audience.
3. Mastery of evaluating and analyzing the current research literature.
4. Mastery of comprehensive knowledge of biomedical sciences.
5. Mastery of the ability to design and conduct original biomedical research.

III. Assessment Activities

These learning outcomes, assessment activities associated with them, and results are summarized in the following paragraphs and the accompanying chart.

1. Mastery of basic knowledge of biochemistry, cellular biology, and molecular biology.

This outcome is assessed through the examinations given in BMS 600, Foundations of Biomedical Science, which is a required course for all BMS students. The assessments are multiple-choice questions provided by the

faculty teaching in the course. There are 5 in-class exams and 14 weekly on-line quizzes. The benchmark is an average of 80% or better on the examinations and quizzes, which corresponds to a letter grade of B or better. In 2010-2011, 18 of 21 students successfully met this standard. The class average was 84%, with a range of 72 – 95%.

In 2011-12, this course will be improved in several ways. The course is currently taught to the BMS Research MS and PhD students, Medical Sciences MS students, and Forensic Science MS students. Based on past poor performance by the Forensic Science students, these students will take a Forensic Biochemistry course better suited to their needs and backgrounds. The Medical Sciences students will take the medical school course, Molecular Basis of Medicine, which covers most of the same topics as BMS 600 and is more suited to their needs as future medical students.

In 2011-12 BMS 600 will focus on the MS and PhD research students. One 50-minute session will be added each week to discuss scientific papers that describe in more depth concepts presented in the lectures. Exam questions will be short answer/essay to measure in more depth the students' knowledge of the material.

2. Mastery of communicating research results to a professional audience.
This outcome is assessed by evaluation of student oral presentations in BMS 680, Seminar (Appendix 1). Faculty and students evaluate the presentations. The presenter meets with an Evaluation Committee consisting of the BMS 680 course director, the BMS 660+661 (BMS Communications) course director, the chair of the student's committee, and a student representative. The benchmark is a rating of "Satisfactory" by the committee. The feedback from the committee helps the student improve subsequent presentations. In 2010-11, 35 of 35 students met this benchmark. The BMS 660 + 661 course director helps first-year students prepare their presentations by giving feedback on several 2-minute video presentations.

3. Mastery of evaluating and analyzing the current research literature.
This outcome is assessed by evaluation of student oral presentations in area of emphasis-specific journal clubs. Faculty evaluate the presentations in the Cardiovascular Disease and Toxicology areas of emphasis using the attached forms (Appendices 2 and 3). The benchmark is a score of 80%. In 2010-11, 4 of 4 students met this benchmark in the Cardiovascular Disease area of emphasis and 5 of 5 students met this benchmark in the Toxicology area of emphasis.

4. Mastery of comprehensive knowledge of biomedical sciences.

For PhD students, this outcome is assessed by both written and oral comprehensive exams given after most or all coursework has been completed. The student's advisory committee members prepare the questions for the written exam. Each student is required to write a research proposal for the oral part of this examination, which is evaluated by the advisory committee. Benchmarks are a grade of Pass, determined by each advisory committee and evaluated subjectively by each committee. In 2010-2011, 6 of 6 students successfully met the benchmark.

For Research MS students who choose the non-thesis track, the outcome is assessed by a comprehensive oral exam. A three-person faculty committee asks the student to write a 10-page review paper on a topic related to their research. The questions on the oral exam are based on this paper and are designed to test the student's knowledge of the topic. The benchmark is a grade of Pass. In 2010-11, 1 student successfully met the benchmark.

For the Medical Sciences students, this outcome is assessed by a comprehensive exam given at the end of the second year. It is required for graduation. It is a multiple-choice exam covering the 3 required courses – Foundations of Biomedical Science, Neurophysiology, and Medical Microbiology. The benchmark is a 70% or higher score on the exam. In 2010-2011, 10 of 10 students met this benchmark. Prior to the date of the next Medical Sciences Comprehensive exam, the questions will be updated to ensure assessment of the most relevant material.

5. Mastery of the ability to design and conduct original biomedical research.

This outcome is assessed by writing a Ph.D. dissertation and defending it in an oral exam. The assessment is performed by each student's advisory committee, which sets the benchmarks for each individual Ph.D. student. Four of the five committee members must rate the written dissertation and defense as satisfactory. In 2010-2011, 4 of 4 students met the benchmark.

IV. Overview of changes implemented in program this past year based on results and planned action specified in last year's report.

The learning outcome "Basic aptitude for laboratory research" was deleted in 2010-11 because the assessment tool did not measure the outcome. It measured how well a student worked in a laboratory environment but not if they mastered basic aptitudes for laboratory research. The learning outcome "Ability to make oral presentations of scientific material" was deleted in 2010-11 because it was not well defined. It was replaced with outcomes 2 and 3.

V. Changes made to program based specifically on data obtained during Assessment Day Activities

None

VI. Assistance Needed with Assessment

I could use help in identifying rubrics and improving our assessment measures.

Marshall University
Assessment of Program's Student Learning Outcomes for the *Biomedical Sciences Program*
2010-11

Not every student learning outcome must be assessed every year. However, it is expected that at least one-fourth of the outcomes will be assessed each year, allowing for assessment of all outcomes within a four-year cycle. It also is important to use more than one assessment measure for each outcome.

Program's Student Learning Outcomes	Year evaluated	Assessment Measures (Tools)	Benchmarks	Results	Analysis/ Planned Actions
Mastery of basic knowledge of biochemistry, cellular biology and molecular biology	2010 /11	Multiple-choice exams; weekly quizzes	80% average	18/21 students met the benchmark; class average was 84%.	Most students met the benchmark, but the course is not meeting the needs of all the students. Non-research students will be taught in different courses next year.
Mastery of communicating research results to a professional audience	2010 /11	Faculty and student evaluations	Satisfactory	35/35 students met the benchmark.	The program will continue to use this assessment tool to measure this outcome.
Mastery of evaluating and analyzing the current research literature	2010 /11	Faculty evaluations	Satisfactory		The program will continue to use this assessment tool to measure this outcome.
Mastery of comprehensive knowledge of biomedical sciences	2010 /11	(A) Written and oral exams; (B) Multiple-choice exam	(A) Pass; (B) 70%	(A) 7/7 students met the benchmark. (B) 10/10 students met the benchmark	The program will continue to use this assessment tool to measure this outcome.
Mastery of the ability to design and conduct original biomedical research	2010 /11	Writing Ph.D. dissertation; oral defense	Satisfactory	4/4 students met the benchmark.	The program will continue to use this assessment tool to measure this outcome.

APPENDIX 1

BMS 680 Seminar Evaluation, Spring 2011

NAME: _____ DEPARTMENT: _____

SPEAKER: _____ DATE: _____

4= Excellent 3= Effective 2=Average 1=Less Effective 0= Needs Work

1. INTRODUCTION:

Background/Objectives of the Problem/Lecture well explained _____
Stimulate Interest and Bring Attention _____
Set Frame Work _____
Preview of the Over-All Organization _____

2. BODY:

Logical Progression _____
Preview New Sections _____
Summarizes Sections _____
Transitions Used Effectively _____
Quality of Illustrations Easily Comprehended _____
Quantity of Illustrations _____
Adequate Explanation of the Illustrations _____
Clarity of Difficult Concepts/Techniques/Methods _____
Major Points Supported with Evidences (if applicable) _____
Key Points Emphasized _____

3. CONCLUSION:

Provided Summary and Logical Conclusion (If applicable) _____
Highlighted Main Points _____
Linked to Introduction _____
Linked to Relevant Information _____
Appropriate Speculation (if applicable) _____

4. DELIVERY TECHNIQUE AND STYLE:

Good Eye Contact _____
Good Vocal Volume _____
Choice of Language (clear, effective and appropriate) _____
Body Language (Attitude, Confidence, Poise, Movements, Distractions) _____
Smooth Pace of Progression _____
Smooth Flow of Ideas _____

5. OVERALL EVALUATION:

Abstract/Outline was informative and concise (if applicable) _____
Content well organized _____
Delivery was smooth and effective _____

6. Please provide the comments about the most effective aspects and the most needed work of this presentation.

Most Effective	Needs Work
A. CONTENT:	
B. TECHNIQUE:	

7. List any additional comments and questions for the presenter that were not previously raised by the audience during the seminar:

APPENDIX 2

Presenter _____

BMS 665 CODRC COLLOQUIUM

Faculty in attendance will evaluate your presentation. They will assign a point value for each portion of your presentation. The total number of points possible will be 100 for each presentation. A minimum score of 80 is required to successfully complete a presentation. If the average score for a presentation is below 80, the student will be required to present an additional paper.

Segment of Presentation	Points	Description of requirements
INTRODUCTION	18-20	Clearly identify purpose and goals of the research. The rationale for selection of the paper is given in a clear and concise manner.
	16	Either: a) the purpose or goals of the research are presented but must be identified by the audience or b) the rationale for selection of the paper is not identified.
	14	Presenter fails to identify both: a) the purpose and goals of the paper and b) the rationale for selection of the paper.
METHODS & RESULTS	18-20	Clearly identify procedures to test hypothesis. Present results to support or reject hypothesis.
	16	Overview of methods and/or results is given. However, the audience must identify the rationale of studies or whether the results support overall hypothesis.
	14	Fail to describe methods. Have a lack of knowledge regarding methods. Fail to present results in a clear manner. Audience had difficulty understanding whether results prove experimental goals.
SUMMARY	18-20	Summarize results and accomplishment of goals. Clearly identify the importance of research. Identify the strengths and weaknesses of the paper.
	16	Summarize results and state where the goals of the research were accomplished. Presenter should have given a clearer statement of importance of research or the strengths and weaknesses of the paper.
	14	Presenter needed to improve summary of results. Presenter fails to identify strengths and weaknesses of paper and the importance of research.
PRESENTATION SKILLS	18-20	Good use of visual aids of tables, figures or schemes to present all aspects of paper. Good use of eye contact. Presentation kept audience attentive and stimulated interest. Presentation fits allotted time of 30 min.
	16	Good use of Visual aids Presentation fits allotted time of 30 min Presenter excessively reads from notes or needs to improve eye contact with audience Audience kept attentive and interested for most of presentation
	14	Presentation either shorter than 20 min or longer than 40 min; Poor use of visual aids to emphasize a point Presentation did not keep audience interested
Presentation Points		Maximum of 80
Paper Selection		Maximum of 20
TOTAL POINTS		Maximum of 100

ANY OTHER COMMENTS:

Fall 2010

APPENDIX 3

Presenter _____

PMC 655 TOXICOLOGY REVIEWS

Faculty in attendance will evaluate your presentation. They will assign a point value for each portion of your presentation. The total number of points possible will be 100 for each presentation. A minimum score of 80 is required to successfully complete a presentation. If the average score for a presentation is below 80, the student will be required to present an additional paper.

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TOTAL POINTS		Maximum of 100