

Biology Department Student Learning Assessment Plan
UPRM
www.uprm.edu/biology/team

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Biology Department Student Learning Assessment Plan

UPRM

The Biology Department Assessment Plan has been developed based on the Institutional and the Departmental vision and mission.

The Biology Department Vision

El Departamento de Biología del Recinto Universitario de Mayagüez de la Universidad de Puerto Rico habrá de alcanzar los niveles más altos en la educación superior de Puerto Rico, dirigiéndose al desarrollo de la tecnología, a una continua revisión y constante expansión de los programas educativos y a la modernización de su infraestructura.

The Biology Department at the University of Puerto Rico, Mayagüez Campus seeks to obtain the highest levels in Superior Education in Puerto Rico, aiming towards the development of technology, a continual revision and constant expansion of its educational programs, and the modernization of its infrastructure.

The Biology Department Mission

El Departamento de Biología desarrollará en cada profesor y alumno el pensamiento crítico, el entusiasmo, la iniciativa y las destrezas necesarias para que sea un eterno estudioso de la Biología. Se hará énfasis en los conceptos básicos y la investigación en un ambiente que promueva el desarrollo de profesionales con sensibilidad social, cultural y humanística, y con profundos valores éticos. Así, se aportará al enriquecimiento de la ciencia y la sociedad mediante la creación y diseminación de nuevo conocimiento a través de la investigación científica.

The Biology Department will develop in each professor and student, critical thinking, enthusiasm, initiative and the necessary skills to become lifelong students of Biology. Emphasis will be placed on basic concepts and research, in an environment that promotes the development of professionals with social, cultural and humanistic sensibility as well as profound ethical values. In this way, the Department will contribute to the enrichment of science and society through the creation and dissemination of new knowledge through scientific research.

UPRM Vision

“Transform UPRM into a leader institution of higher education in Puerto Rico and the American hemisphere, responding to the needs of a modern society, in a dynamic and global environment, in the continuous search for truth, knowledge, justice and peace”.

UPRM Mission

“Within the philosophical framework established by the University of Puerto Rico Act, the

Mayagüez campus directs its efforts towards the development of educated, cultured citizens, capable of critical thinking, and professionally qualified in the fields of agricultural, social, and natural sciences, engineering, humanities and business administration. They should be able to contribute in an efficient manner to the cultural, social, and economic development of the Puerto Rican and international community. This process is aimed at endowing our alumni with a strong technical and professional background and to instill a strong commitment to Puerto Rico and our hemisphere. Our alumni should have the necessary skills and knowledge to participate effectively in the search for solutions to the problems facing us, to promote the enrichment of the arts and culture, the development and transfer of technology as well as to uphold the essential attitudes and values of a democratic society.”

Biology Student Learning Outcomes (Graduating Biology Student Profile)

The Biology Department Programs aim to develop graduates with the following skills and values, as well as with proficiency in the following scientific concepts:

Skills and Values

- Critical thinking and problem solving skills through the scientific method
- Team working skills
- Communication skills in Spanish and English
- Computer literacy and its scientific applications
- Knowledge of up-to-date scientific tools and techniques
- Awareness of contemporary scientific issues
- Awareness of ethical implications in science
- Ability to learn by him/herself (lifelong learners)

Scientific concepts

- Cell structure and physiology
- Organismal biology (zoology, botany and microbiology) with emphasis in tropical environments.
- Genetics: classical, population and molecular
- Chemical, physical and mathematical applications to biology
- Ecology: Interrelationship among organisms and its environment, population, ecology, biodiversity and conservation biology
- Evolution as a unifying science

The Graduating Biology Student Profile was approved by the faculty on April 15, 2002.

Biology Department Program Outcomes

I. Students that meet the graduating student profile should, at graduation, have:

- Proficiency in a range of basic biological concepts
- The ability to apply scientific technology and the scientific method to solve problems
- Computer literacy, problem solving, math reasoning skills, critical thinking, ability to judge scientific validity, able to write and speak effectively.
- Up-to- date knowledge of scientific technology and issues
- Ethical values
- Research experience and skills
- Interest in life-long learning

II. Faculty involved in the assessment plan will have:

- Assessment training and awareness of its importance
- Improved teaching /learning methods
- Capacity to teach up-to-date courses
- Potential to disseminate assessment outcomes

Biology Department Student Learning Assessment Plan

The Biology Departmental Assessment Plan has been designed to evaluate how the Biology curriculum, research and other activities complement each other to achieve the graduating student skills and knowledge. For this, the following data is being collected:

ASSESSMENT STRATEGIES & TIMING

ASSESSMENT TOOLS	Timing (Person responsible)
<i>Course Assessment</i>	
Laboratory Reports (<i>copies</i>)	During most Laboratory Courses (Lab Instructors)
Exams, Quizzes, Homework, course projects (<i>copies</i>)	Throughout each semester (all Professors/Instructors)
Written Report Assessment	Whenever required whether lab or lecture (undergraduate seminar course, labs, etc) (Professors/Instructors)
Oral Presentation Assessment	Whenever required whether lab or lecture (undergraduate seminar course, labs, etc) (Professors/Instructors)
Teamwork Assessment Form	At end of any semester where work is performed in groups (Professors/Instructors)
Student's evaluation of Teaching Assistants	At end of every Laboratory Course (all students)
Student's Evaluation of Teaching (UPRM Form)	After 10 weeks of each semester (all students)
Student's Evaluation of Course Skills and knowledge	At end of every course (all students)
Pre- and Post-General Biology test	At beginning and end of each semester (General Biology I and II (by all General Biology students)
Faculty Course/Student Profile Correlation Form	When a professor teaches a new course and included with course syllabus (Professor)
Teaching Assistants Assessment of Laboratory Coordinator	Yearly (teaching assistants)
Course Portfolio	Core courses (faculty teaching the course)
<i>Program Assessment</i>	
Career orientation in the General Biology Course (Pre-Post assessment)	At beginning and again at end of presentation in General Biology Laboratory (by students)
Senior students curriculum assessment form	At end of CAPSTONE Courses (by CAPSTONE students)

Undergraduate Research Assessment Form (Student)	At completion of research experience (student)
Undergraduate Research Assessment Form (Mentor)	At completion of research experience (mentor)
Student Assessment of Research Workshop	At end of workshop (by students)
<i>Post Graduation</i>	
Alumni Assessment of Biology Curriculum	UPRM Biology Teaching Assistants who graduated from this Biology Department. Future efforts will be made to obtain additional alumni input.

ASSESSMENT OF LEARNING OUTCOMES

Learning Objectives/Outcomes Student Graduating Profile	Assessment Strategy
Critical thinking and problem solving skills through the scientific method	Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Undergraduate Research Experience Assessment Form (students and mentors)
Team work skills	Teamwork Assessment Form Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Student Undergrad Research Experience Assessment Form (students and mentors)
Communication skills in Spanish and English	Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Undergraduate Research Experience Assessment Form (students and mentors)
Computer literacy and its scientific applications	Lab Reports Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Undergraduate Research Experience Assessment Form (students and mentors)
Knowledge of up-to-date scientific tools and techniques	Lab Reports Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Undergraduate Research Experience Assessment Form (students and mentors)

Awareness of contemporary scientific issues	Lab Reports Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Undergraduate Research Experience Assessment Form (students and mentors)
Awareness of ethical implications in science	Ethics Integration Assessment Form Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Undergraduate Research Experience Assessment Form (students and mentors)
Ability to learn by him/herself (lifelong learners)	Undergraduate Research Experience Assessment Form (students and mentors) Faculty Course/Student Profile Correlation Form
Cell structure and physiology	Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Pre- and Post-General Biology test
Organismal biology (zoology, botany and microbiology) with emphasis in tropical environments	Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Pre- and Post-General Biology test
Genetics: classical, population and molecular	Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Pre- and Post-General Biology test
Chemical, physical and mathematical applications to biology	Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Pre- and Post-General Biology test

<p>Ecology: interrelationship among organisms and its environment, population Ecology, biodiversity and conservation biology</p>	<p>Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Pre- and Post-General Biology test</p>
<p>Evolution as a unifying science</p>	<p>Lab Reports Exams, Quizzes, Homework, Course projects, Written and oral Report Assessment Student Course Skills and Knowledge Assessment Form Faculty Course/Student Profile Correlation Form Pre- and Post-General Biology test</p>

INSTITUTIONAL OUTCOMES AND BIOLOGY DEPARTMENT OUTCOMES

Institutional Learning Outcomes

By the time of their graduation, UPRM students will be able to:

- a. Communicate effectively.
- b. Identify and solve problems, think critically, and synthesize knowledge appropriate to their discipline.
- c. Apply mathematical reasoning skills, scientific inquiry methods, and tools of information technology.
- d. Apply ethical standards.
- e. Recognize the Puerto Rican heritage and interpret contemporary issues.
- f. Appraise the essential values of a democratic society.
- g. Operate in a global context, relate to a societal context, and demonstrate respect for other cultures.
- h. Develop an appreciation for the arts and humanities.
- i. Recognize the need to engage in life-long learning.

Biology Department learning Outcomes

By the time of their graduation, biology department students will have the following skills, values and knowledge:

Skills and Values

1. Critical thinking and problem solving skills through the scientific method
2. Team working skills
3. Communication skills in Spanish and English
4. Computer literacy and its scientific applications
5. Knowledge of up-to-date scientific tools and techniques
6. Awareness of contemporary scientific issues
7. Awareness of ethical implications in science
8. Ability to learn by him/herself (lifelong learners)

Scientific concepts

9. Cell structure and physiology
10. Organismal biology (zoology, botany and microbiology) with emphasis in tropical environments.
11. Genetics: classical, population and molecular
12. Chemical, physical and mathematical applications to biology
13. Ecology: Interrelationship among organisms and its environment, population, ecology, biodiversity and conservation biology
14. Evolution as a unifying science

Correlation of Biology Program Outcomes with Institutional Learning Outcomes

Institutional Learning Outcomes	Biology Department Outcomes													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Communicate effectively			✓											
Identify and solve problems, think critically, and synthesize knowledge appropriate to their discipline	✓								✓	✓	✓	✓	✓	✓
Apply mathematical reasoning skills, scientific inquiry methods, and tools of information technology	✓			✓								✓		
Apply ethical standards							✓							
Recognize the Puerto Rican heritage and interpret contemporary issues						✓				✓				
Appraise the essential values of a democratic society							✓							
Operate in a global context, relate to a societal context, and demonstrate respect for other cultures						✓							✓	
Develop an appreciation for the arts and humanities														
Recognize the need to engage in life-long learning								✓						

History of Development of the Biology Department Assessment plan(and current status):

1. Faculty and teaching assistants are made aware of the importance of assessment through meetings, workshops and presentations (2000- present)
2. Howard Hughes PROMISE CARE Program Assessment in CARE courses(2000- 2004)
3. Constituted the Biology Department Assessment Coordinator & Committee -TEAM (Teaching and Learning Enhancement throughout Assessment and Mentoring)- 2002
4. Designed a graduating student profile with those skills and knowledge that are to be develop in the students through the biology curriculum
5. Faculty approved the graduating student profile (April 15, 2002) in departmental meeting.
6. The departmental strategic plan was revised to include the graduating student profile (2002)
7. Disseminated the graduating student profile among faculty and students through hand outs, internet and meetings (2002-present)
8. Faculty correlated their courses (cores, laboratories and electives) with the approved student profile (2002)
9. Developed a Department Assessment Plan (2003)
10. Collect assessment data already available in the department (2001-in progress)
11. Assessment forms from the Howard Hughes PROMISE Assessment Tool Box were modified and used.
12. Assessment forms for specific department activities and courses to evaluate student progress were designed (2002-present)
13. Distribute assessment forms to constituents (as specified in the Plan)
14. Offered Department Seminar on Institutional Learning Assessment Plan by assessment expert. (October 30, 2003)
15. Department Director and Assessment Coordinator attended the Assessment Workshop: Quality Assurance through Continuous Assessment. (November 18, 2003-Mayagüez Resort)
16. Collect, tabulate and interpret the data (in progress)
17. Prepare course portfolio with evidence of student learning and skills development as earlier stated in the profile/correlation table. (in progress)
18. Return results and feedback to constituents for proper action (in progress)
19. Disseminate assessment results at local, national meetings and through publications (continuously 2000-2004)

Biology Department Student Learning Assessment Reports:

- Departmental Assessment Report (in progress)
- PROMISE Annual Assessment Reports (2000, 2001, 2002 and 2003)
- Departmental Strategic Plan (2002)
- Department Assessment TEAM handout and website
- MARC/SLOAN Assessment Reports

Actions taken according to assessment results:

- Syllabus with objectives
- Revised strategic plan
- Used strategic plan to evaluate new candidates for Department Head Position
- General Biology course modification
- CARE laboratories and courses modified and innovated
- Included ethics, communication, computers and teamwork into curriculum
- Curriculum revision
- Course revision

APPENDIX

- Biology Department Assessment Homepage (www.uprm.edu/biology/team)
 - TEAM Brochure
 - Assessment Forms
 - Curriculum Assessment of Skills and Knowledge
 - Course and Laboratory Assessment of Skills and Knowledge
 - Alumni Curriculum Assessment of Skills and Knowledge
 - Undergraduate research (mentor, student)
 - For Faculty to correlate student profile with Course
 - PROMISE Assessment Tool Box- includes other assessment (Ex. Communication, teamwork, etc.)