

University of Arkansas
Department of Biological Sciences
Graduate Program Assessment (BIOL MS, BIOL PhD)
Report: Academic Year 2018-2019

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A. General Background:

The graduate programs in Biological Sciences (M.S. and Ph.D.) offer the opportunity for advanced study and research for students that desire a comprehensive view of biological sciences. Accomplishment is judged by competence and a developing sense of responsibility for the advancement of knowledge rather than the fulfillment of routine requirements. It is expected that all candidates for advanced degrees will have a period of study in residence, complete the required courses in advanced biology appropriate for the chosen discipline, demonstration of advanced competence in the chosen area of expertise, satisfactory introduction to allied subjects, the ability to communicate at a scholarly level, and the satisfactory performance in examinations. As of Spring 2019, the BISC graduate student population is represented by 68 BIOL students, 39 CEMB students, 1 ENDY and 1 SPAC student. For assessment purposes, we only include those obtaining an M.S. or Ph.D. in Biology (BIOL). In the Spring of 2019, the BIOL program had 52 Ph.D. and 16 M.S. students actively enrolled.

For the AY2018-2019 academic year, we are providing data on our single most important metric, namely the scientific careers of our graduates upon completion of their advanced degree. A longitudinal summary (2006 to 2019) of those data are provided for both the M.S. and Ph.D. graduates.

B. Outcome Reporting:

Learning Outcomes: PhD in Biology

- Mastery of the chosen discipline of biology at the graduate level
- Capacity for original research as evidenced by the preparation and defense of a Ph.D. dissertation
- Ability to communicate effectively both as a participant and presenter in graduate seminars
- Demonstrated excellence in the classroom for teaching assistants
- Professional development in science via the presentation of research at national conferences, applying for and receiving nationally competitive grants, publishing research articles and books in the chosen discipline, participation in departmental professional development seminars
- Participation in the academic life of the Department (attending seminars and public lectures)

Learning Outcomes: M.S. in Biology

- Mastery of the chosen discipline of biology at the graduate level
- Capacity for original research as evidenced by the preparation and defense of a M.S. thesis
- Ability to communicate effectively both as a participant and presenter in graduate seminars
- Demonstrated excellence in the classroom for teaching assistants
- Professional development in science via the presentation of research at national conferences, applying for and receiving nationally competitive grants, publishing research articles and books in the chosen discipline, participation in departmental professional development seminars
- Participation in the academic life of the Department (attending seminars and public lectures)

C. Results of Assessment:

For Ph.D. seeking graduate students, we have assessed their continuation in science careers after completion of their doctoral degree in the Department of Biological Sciences. We have classified students into six broad categories:

1. Employed as a faculty member (Instructors, Assistant Professors, Associate Professors, Professors at academic institutions nationally and internationally.
2. Employed in postdoctoral training positions.
3. Employed in nonacademic science (i.e. industry, state or federal agencies).
4. Continued education toward a professional degree (i.e. MD, DO, JD, DDS, etc.)
5. Left the Ph.D. program without completion.
6. Unknown

The results of our longitudinal data from 2006 to 2018 are shown below in Table 1.

Table 1: Longitudinal data on Ph.D. graduates in Biological Sciences.

Ph.D. graduates	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	% Total
Faculty	1	3	3	4	5	2	2	3	0	0	0	0	0	1	24	38.1
Postdoctoral	1	0	0	0	1	2	1	3	0	4	4	1	1	2	20	31.7
Nonacademic sci.	0	0	1	1	3	0	1	0	1	2	0	1	0	2	12	19.1
Professional	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Left Ph.D.	0	0	0	0	0	0	0	0	1	2	2	0	0	0	5	7.9
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3.2
TOTAL	2	3	4	5	9	4	4	6	2	8	6	2	2	6	63	100

For M.S. seeking graduate students, we have assessed their continuation in science careers after completion of their M.S. degree in Biological Sciences. We have classified students into six broad categories:

1. Employed in science-related technical positions.
2. Continued education toward a Ph.D. at the U of A or other doctoral granting institutions.
3. Employed as science instructors (i.e. K-12, college, etc.)
4. Continued education toward a professional degree (i.e. MD, DO, JD, DDS, etc.)
5. Employment outside of science
6. Unknown or left the program

The results of our longitudinal data from 2006 to 2019 are shown below in Table 2.

Table 2: Longitudinal data on M.S. graduates in Biological Sciences.

M.S. graduates	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	% Total
Employed in science	2	3	2	0	1	1	3	1	5	4	1	5	3	2	33	44.6
Education to Ph.D.	3	1	2	1	0	2	0	2	0	3	1	0	1	1	17	23
Science Instructor	1	0	2	0	1	0	0	0	1	1	1	0	0	0	7	9.5
Professional	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2.7
Outside science	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1.3
Unknown	2	0	1	2	0	0	0	0	1	4	1	1	0	2	14	18.9
TOTAL	9	5	7	3	2	3	3	3	7	12	4	6	5	5	74	100

Summary of Assessment (2006 to 2019):

The Department of Biological Sciences has successfully graduated 137 students (2006-2019) that were awarded advanced degrees (M.S. or Ph.D.) in Biology. The students receiving M.S. degrees maintained a GPA as required to be awarded the degree. Additionally, they have successfully written M.S. theses and defended their theses before a committee of experts in the respective fields of biology. The students receiving Ph.D. degrees have maintained a GPA as required by the University to be awarded the degree. In addition, they have successfully passed both written and oral qualifying examinations to enter doctoral candidacy. Finally, the doctoral students have successfully written doctoral dissertations and defended the dissertation before a committee of experts in their field of biology. Most importantly, the vast majority of M.S. and Ph.D. students (~88%) completing advanced degrees in biology have remained successfully employed in science-related disciplines after completion of their advanced degrees in Biology.

Since 2006 the Department of Biological Sciences has graduated 63 doctoral students with only 5 students leaving the program without degree completion (92% completion). Of those that completed their degree, ~38% are employed as faculty members, ~32% are in postdoctoral

training positions and ~19% employed in nonacademic science jobs. Most important, students completing their doctoral degrees in Biological Sciences at the UA are successfully gaining employment (Table 1).

Since 2006 the Department of Biological Sciences has graduated 74 Master's degree students with only 4 that were dismissed from the program without degree completion (95% completion). Of those that completed their degree, ~45% are employed in science-related technical positions, 23% continued their education toward a doctoral degree, ~10% were employed as a science instructor and ~3% pursued other professional degrees. Thus, students completing their M.S. degrees in Biological Sciences are successfully gaining employment with the majority (77%) remaining in a science-related career.