Program Review Self-Study Template

Academic unit: Biological Sciences

College: Fairmount College of Liberal Arts and Sciences_____

Date of last review

1. Departmental purpose and relationship to the University mission (refer to instructions in the WSU

our mission currently. Data suggest that the training that we provide our graduate students prepares them well for PhD programs and jobs in industry, government agencies and education.

      e.   Provide an overall description of your program (s) including a list of the measurable goals and objectives of the

Measurement tools for learner centered objectives

We used a multi-faceted approach to evaluating the efficacy of our MS program in meeting our learner-centered objectives. First, we determined the current activities of our graduates using 1) our 'MS graduate student exit survey,' which asks whether the student has been admitted for advanced study or been hired at the time he/she graduates, 2) on-line searches of professional networking sites, and 3) surveys of faculty about the activities of recent graduates from their labs. Second, we evaluated thesis defenses and defenses of capstone projects using a 'learner outcomes' rubric is completed by Biology faculty on the thesis or capstone committee. This rubric indirectly evaluates our learner-centered objectives because it provides information on whether students have obtained the skills and behaviors that are required to follow career paths identified in our objectives. Finally, since our last program review we started assessing students' preparation to meet our learner-centered objectives through faculty evaluations of student professional presentations given in our departmental seminar series. This assessment tool provides information on students' progress toward attaining skills needed to meet our learner-centered objectives while they are still in the MS program and increases the comprehensiveness of our assessment. We implemented this new assessment tool in response to "Needs Going Forward" identified in the last round of program review.

The table below maps learner outcomes onto the learner-centered objectives with which they are most closely associated. The learner outcomes are identified by numbers.

Learner outcomes
1. Students will be familiar with topical research questions and hypotheses in their field of biology.
2. Students will be able to interpret hypotheses, methods and results presented in primary scientific literature.
3. Students will be able to formulate testable research questions and hypotheses.
4. Students will be able to design and analyze experiments or observational studies that test research questions and hypotheses.
5. Students will acquire the ability to orally communicate scientific research in meeting-style presentations and in seminars.
6. Students will be able to communicate scientific research to other scientists in writing.

Objective	Learner Outcome
Pursue advanced degree in Biology	1,2,3,4,5,6
Careers in private industry	1,2,3,4,5,6
Careers in government agencies	1,2,3,4,5,6
Teaching Biology at high school, junior college, community college	1,2,3,4

Programmatic Goals
Goal 4: We will maintain a "critical mass" of graduate students to generate a dynamic, intellectually diverse Biology graduate student community.
Goal 5: Graduate faculty will maintain active, nationally recognized research programs.

Programmatic Objectives
Objective 1: Recruit and enroll so that there is an average of 1-2 graduate students being advised per graduate faculty member.
Objective 2: Graduate faculty will average 1 or more peer-reviewed publication per year.
Objective 3: Graduate faculty will average attendance at 1 or more national or international scientific meeting per year.

Measurement tools for programmatic objectives

We use annual faculty activity reports to provide data to evaluate whether the programmatic objectives are being met.

2. Describe the quality of the program/certificate as assessed by the strengths, productivity, and qualifications of the faculty in terms of SCH, majors, graduates, and scholarly/creative activity (refer to instructions in the WSU Program Review document for more information on completing this section).

Scholarly

* Winning by competitive audition. **Professional attainment (e.g., commercial recording). ***Principal role in a performance. ****Commissioned or included in a collection.

- Provide a brief assessment of the quality of the faculty/staff using the data from the table above and tables 1-7 from the Office of Planning Analysis as well as any additional relevant data. Programs should comment on details in regard to productivity of the faculty (i.e., some departments may have a few faculty producing the majority of the scholarship), efforts to recruit/retain faculty, departmental succession plans, course evaluation data, etc.

Provide assessment here:

During this assessment period (FY2015-FY2017) the number of tenure or tenure-track graduate faculty in the Biology Department declined from 11 to 10. The number of tenure or tenure-track faculty who taught undergraduate courses declined from 12 to 10. Data provided in the above table are drawn from faculty act -5 (t).1694c3.8 (e)-11.6 (c) 12.2 (l) -9.1 (i) -9.ej 0.24 0 0 0.24 11.706 5ntt590.16-9.1

that aspects of applicants' undergraduate experiences beyond grades, perhaps most importantly the nature of applicants undergraduate research experiences, factor significantly into our admission decisions.

    c.   Identify the principal learning outcomes (i.e., what skills does your Program expect students to graduate with). Provide aggregate data on how students are meeting those outcomes in the table below. Data should relate to the goals and objectives of the program as listed in 1e.

| Students will be able to design and analyze experiments or observational studies that test research questions and hypotheses. | 1. Learner outcomes rubric for MS defenses 2. Graduate student departmental seminar presentation evaluations | second presentation. 1. average score of 3 or 4 2. Improvement from first presentation to second presentation. | presentation 1. Mean = 3.31 2. 75% improved from first to second presentation | Please see analysis at end of table |

- o   Think critically and independently
- o   Write and speak effectively
- o   Employ analytical reasoning and problem solving techniques

Provide assessment here:

UNDERGRADUATE PROGRAM: As an urban university in the largest city in Kansas, we allow traditional and non-traditional students the opportunity to pursue a bachelor's degree. The average graduation rate is 58 students/year, an increase of 7 students/year. Based on student survey response data above, 50% of our students attend professional schools upon graduation.   Graduates can expect to find employment, especially if they are willing to move to nearby states. Of the students employed out of state, most are in neighboring states. Most employed students were in the field of biological research or health-related professions; such as pharmacy or optometry technicians. These data show our program is in demand.

MASTER OF SCIENCE GRADUATE PROGRAM: Student demand for the Biology MS program is healthy. After very high numbers of applicants in FY14, FY15 and FY16, our applications declined in FY17. However, this number of applicants was still well in excess of our program's capacity, based upon faculty numbers and assistantship funding. A point of emphasis for us is to ensure we obtain applicants who are well-prepared for graduate research in Biology. In 2015, we re

Mentoring graduate students is a synergistic interaction of the research and teaching functions of our department. Graduate students learn by "apprenticing" in faculty members' research programs. However, they also make possible these research programs, including externally-funded research, by working as graduate research assistants and by addressing pieces of a lab's larger

Peer Institution	Number of Tenured or Tenure-track Faculty Members in Biology Department
New Mexico State University	21
University of Massachusetts-Lowell	16
University of Nevada-Reno	29
University of North Dakota	20
Wright State University	24

With departmental, college, university and professional service demands divided among a small number of faculty, inevitably time for graduate student mentoring and scholarship is challenged. Further, graduate student exit surveys emphasize that students want greater diversity of course offerings and that only can be achieved by hiring faculty whose expertise adds to the breadth of knowledge in our department. Adequate numbers of staff also are crucial for meeting the demands of an active department that is administering substantial external research awards.

Graduate teaching assistantships are a critical resource for maintaining a dynamic MS program when federal research funding, which could support graduate research assistantships, is exceedingly competitive. We are grateful for teaching assistantship funding that allows us to mentor graduate students with whom we can produce data for future grant proposals and that provides crucial support for our undergraduate laboratories. Our ability to teach these labs supports our program, but also has far-reaching effects for the university because we provide courses needed by many other departments. Further, if we are to enroll qualified international applicants, non-instructional funding opportunities must also increase because these students often require funding and do not have the English proficiency to teach in their first semester.

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Chem 531 (5)	Organic I	Chem 531 (5)	Organic I	Chem 531 (5)	Organic I	Chem 531 (5)	Organic I	Chem 531 (5)	Organic I
Chem 532 (5)	Organic II	Chem 532 (5)	Organic II	Chem 532 (5)	Organic II	Chem 532 (5)	Organic II	Chem 532 (5)	Organic II
Chem 661 (3)	Intro Biochemistry	Chem 661 (3)	Intro Biochemistry	Chem 661 (3)	Intro Biochemistry	Chem 661 (3)	Intro Biochemistry	Phys 213 (5)	General College Physics I
Chem 662 (3)	Biochemistry I	Chem 663 Chem 664	Biochemistry II Biochemistry Lab	Chem 662 (3)	Biochemistry I	Chem 663 Chem 664	Biochemistry II Biochemistry Lab		
Chem 666 (3)	Special Topics in Biochem								
Phys 213 (5)	General College Physics I	Phys 213 (5)	General College Physics I	Phys 213 (5)	General College Physics I	Phys 213 (5)	General College Physics I		
Phys 214 (5)	General College Physics II	Phys 214 (5)	General College Physics II	Phys 214 (5)	General College Physics II	Phys 214 (5)	General College Physics II		

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