WOU Biology Department

Current Status:

Coursework:

The Biology Department offers Biology Majors in one of six emphases: general biology, botany, ecology, molecular / cell, pre-professional, and zoology. Each of these major emphases requires a broad set of 300-level core classes that include genetics, evolution, cell biology, microbiology, and field biology as well as specialty courses directly related to each particular emphasis (please refer to the 2008-2009 WOU Catalog for a complete listing of the various Biology emphases requirements). The Biology Department also offers two Biology Minors in the areas of General Biology and Human Biology. Over the past decade (1999 – 2009), averages of 20 majors and 16 biology minors have graduated annually from the WOU Biology Program (Figure 1).

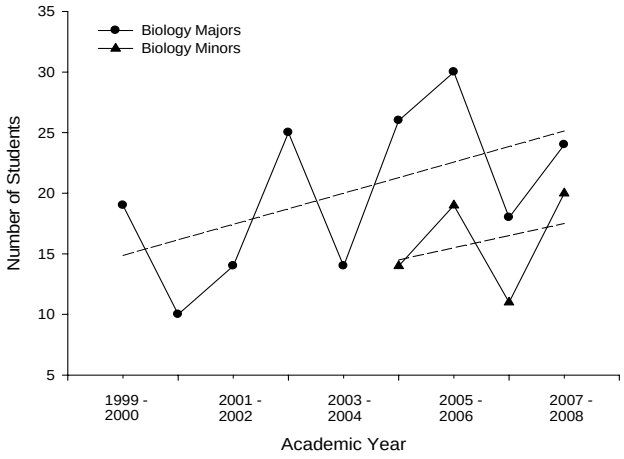

Figure 1. The annual number of students graduating from WOU with a major or minor in biology since the 1999 – 2000 academic year. The dotted lines represent trend lines based on regression analysis of the data.

In addition to serving students seeking a major / minor in biology, the Biology Department also provides coursework for a significant number of non-major health professional students (e.g., pre-nursing, pre-dental hygiene), students seeking other WOU majors that require biology coursework (e.g., Health & Physical Education), and students seeking to fulfill their LACC laboratory science requirement (including the Honors Program).

Overall, there has been a steady increase in student enrollment in biology-related coursework over the past decade. This increase extends to coursework at both the majors and non-majors levels (Figure 2).

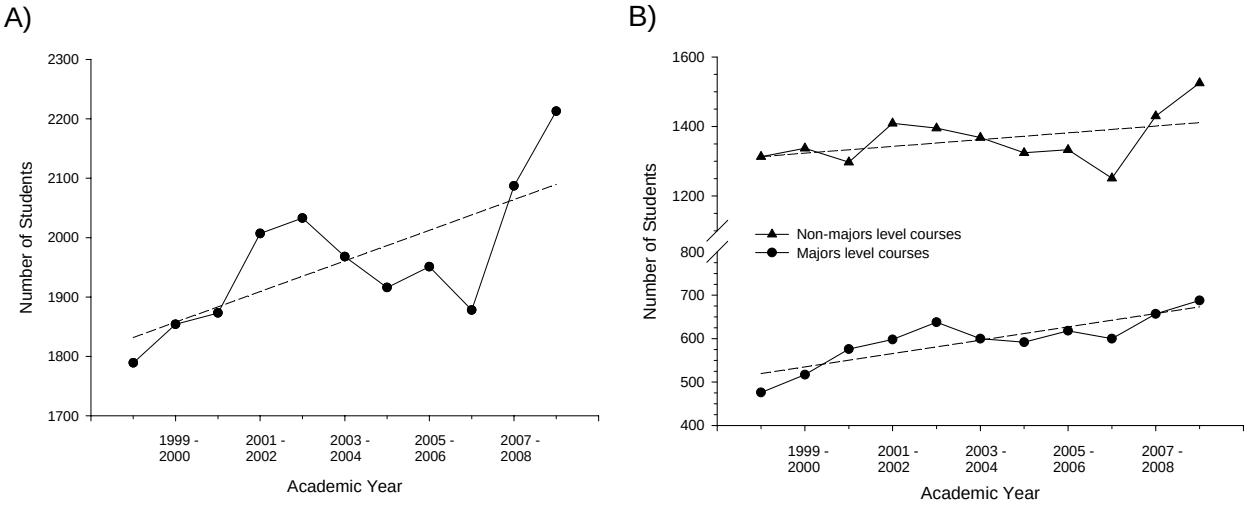

Figure 2. The annual number of students enrolled in biology courses since the 1998 – 1999 academic year (A). The observed increase is due to enrollment increases in both majors and non-majors level coursework (B – majors and non-majors courses plotted separately). The dotted lines represent trend lines based on regression analysis of the data.

Faculty / Staff

Currently, the Biology Department faculty includes eight tenure-track faculty (two full professors, three associate professors, and three assistant professors), and three full-time, non-tenure track faculty. The total hours in the classroom available for the current faculty, assuming 1.0 FTE for each, is 423 hours (36 hours / academic year for tenure-track faculty; 45 hours / academic year for non-tenure track faculty). However, this total does not represent the true hours available as Department Head release time (9 hours / academic year), faculty release time for university committee service (e.g., Faculty senate president, PURE; hours vary depending on assignment), release time for new faculty (3 hours / year), or release time provided via monies from research / teaching grants (hours vary based on grant) are not included in this calculation.

The current 2009 – 2010 academic schedule of courses requires 413.25 hours of the available 423 hours be devoted to the classroom to meet student demand, with approximately 53% of the hours dedicated to non-major level coursework (224 hours) and 47% dedicated to major level coursework (199 hours). Figures 3 and 4 show the percentage breakdown of FTE as it relates to both major and non-major level coursework.

In addition to the biology faculty positions, one full-time and one half-time laboratory preparatory position are devoted to meeting the needs of biology.

Facilities

Biology Department facilities include seven laboratory classrooms, two lab preparatory rooms (with chemical and equipment storage), one greenhouse, one animal room, one cadaver room, eight offices that contain back rooms for research (six have double back rooms and two have single back rooms), four offices that contain no back rooms, and one stand-by office that is in the planning stages to become an additional equipment room. In addition to laboratory classrooms, the Biology Department primarily utilizes four lecture rooms, all in the Natural Sciences Building (NS 016, NS 103, NS 122, NS 215).

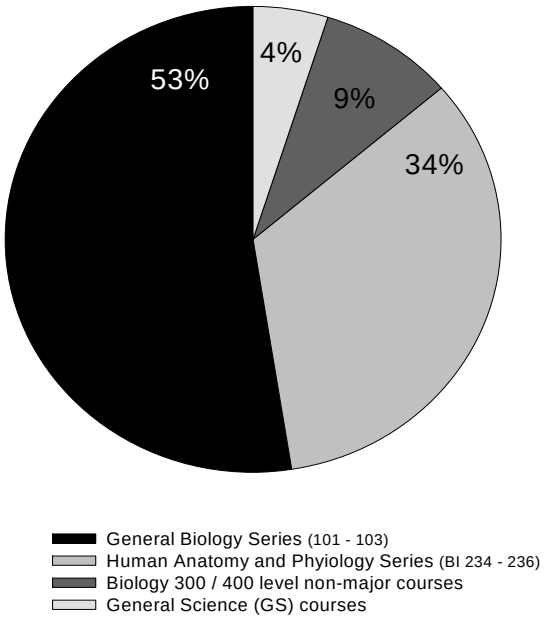

Figure 3. Percentage of non-major / non-minor level FTE hours (total = 224 hours) devoted to various non-major / non-minor level courses.

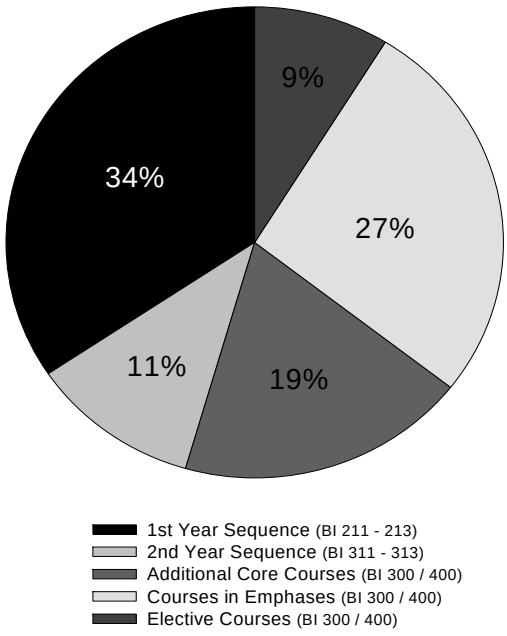

Figure 4. Percentage of major / minor level FTE hours (total = 199 hours) devoted to various major / minor level courses.

Future Considerations:

Faculty / FTE

While the growth in student enrollment noted previously is widespread across the biology curriculum, two areas have shown significant increases. First, enrollment in our majors level introductory series (Biology 211 – 213) has shown a rapid rise in the last five years, with the number of students enrolled in the sequence increasing from just over 200 students during the 2004 – 2005 academic year to approximately 350 students during the 2008 – 2009 academic year (Figure 5). Currently, we are no longer able to find available FTE and space for individuals actively seeking the introductory sequence, having already opened several new laboratories and lecture sections over the past several years. Also, given that 300 – level core courses are currently only designed to serve 24 – 48 students / year (again based on both FTE and space constraints), the implications for observed entry level growth of this magnitude is significant. Indeed, just this past month, we found it necessary to increase the enrollment for our Introductory Genetics course (BI 311) and our Advanced Human Anatomy and Physiology course (BI 334) for the Fall of 2009 to meet these demands. We fear that this may simply represent the 'tip of the iceberg' regarding future enrollment numbers for upper division courses.

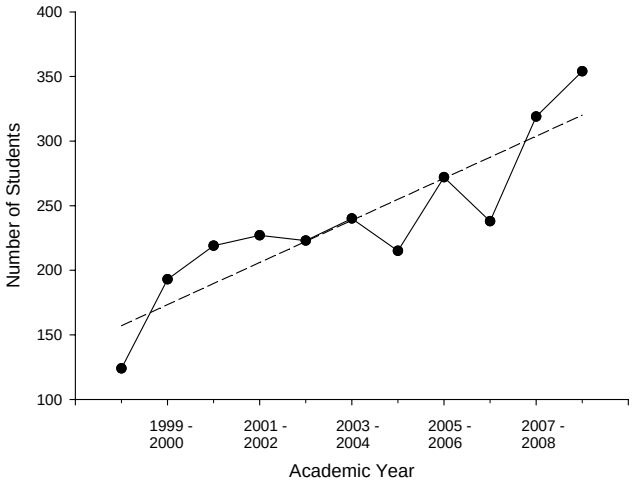

Figure 5. The annual number of students enrolled in the introductory biology for majors series (BI 211 – 213) since the 1998 – 1999 academic year. The dotted line represents the trend line based on regression analysis of the data.

Second, enrollment in our non-major health professional service courses, primarily Human Anatomy and Physiology (BI 234 – 236) and Microbiology for Health Sciences (BI 318), have shown a rapid increase in the last three years (Figures 6 and 7), coinciding with the development of the OHSU Nursing Program – Monmouth Campus. Despite efforts to keep lecture sections for these courses at or under 72 students per section (including developing multiple sections (e.g., BI 318) and / or trailer sequences (e.g., BI 234 – 236)), most of these classes continue to reach capacity. The Human Anatomy and Physiology series has grown in a particularly dramatic manner, with multiple faculty now teaching multiple sections during multiple terms. This growth has been so rapid there are limited times available for the development of common standards among the faculty, a necessity if this series is to

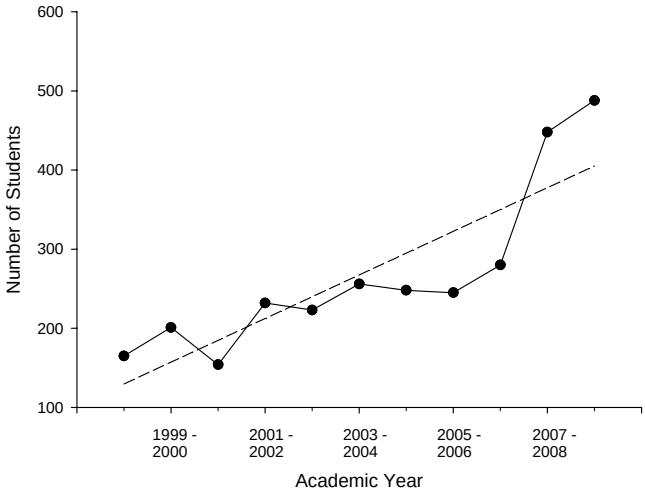

Figure 6. The annual number of students enrolled in the Human Anatomy and Physiology series (BI 234 – 236) since the 1998 – 1999 academic year. The dotted line represents the trend line based on regression analysis of the data.

successfully incorporate new curricular practices in this field.

To address these enrollment increases, the Biology Department must grow in terms of faculty that can serve both majors and non-majors course demands. For example, in terms of majors level enrollment needs, we have discussed developing a Biology 211 – 213 trailer sequence (similar to that already available for Chemistry's introductory series, 221 – 223). This would not only serve an additional 48 majors per year, but it would better address retention issues regarding incoming freshman who are not as prepared for the rigors of the 200 sequence (i.e., these students could begin the non-majors / 100-level biology and chemistry in the fall, transitioning into the majors level series in the winter). Developing a 200-level trailer sequence would add 24 FTE (1 lecture and 2 laboratory sections, serving 48 students / term).

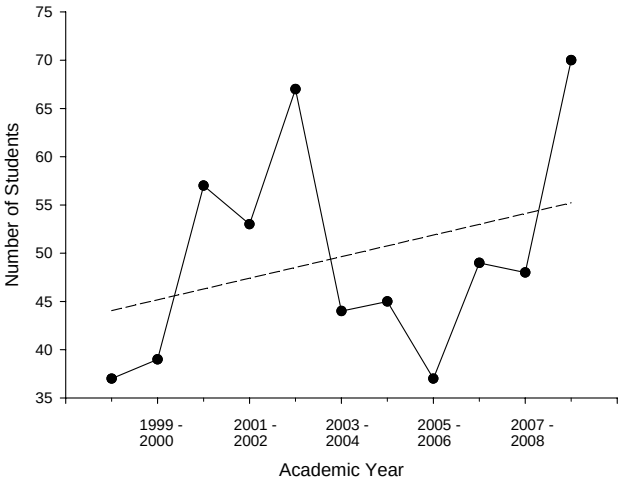

Figure 7. The annual number of students enrolled in the Microbiology for Health Sciences course (BI318) since the 1998 – 1999 academic year. The dotted line represents the trend line based on regression analysis of the data. (Note: In the 2002 – 2003 academic year, this course was removed from the Health & Physical Education major resulting in the rapid decline in enrollment).

To facilitate these growth issues, the Biology Department requests the addition of two tenure-track faculty lines, one with a cell / molecular emphasis and one with an organismal emphasis. In addition to serving the 200-level series, these faculty – given these areas of expertise – will also be able to address growth needs in the 300-level core requirements (e.g., genetics, cell biology, and field biology) and related emphases (e.g., animal physiology, animal diversity). The addition of these faculty lines would also address the non-majors health professional enrollment needs, as either a current faculty member or a new hire could devote time to coordinating the Human Anatomy and Physiology program to provide, deliver, and assess a consistent curriculum and ensure long-term program stability at both the majors and non-majors levels.

Space

In terms of lecture facilities in the Natural Sciences Building, scheduling classrooms – especially for classes that exceed 50 students - is challenging and will continue to be problematic as student numbers increase in our program. Core courses like Genetics, Evolution, and Cell Biology are currently at or just beyond 50 students, the maximum number of seats in the medium-sized lecture rooms in the building; at this time, it is not possible to schedule core courses in the largest lecture rooms because of other courses (including 100- and 200-level biology, and Human Anatomy and Physiology) requiring the use of these rooms. Although the Division is looking at synchronizing schedules to improve some of these issues, the Biology Department anticipates that new building projects on campus (e.g., the Wellness Center) will alleviate pressure on these spaces.

In terms of laboratory space for teaching, most rooms are sufficient but their poor design makes them very inefficient in terms of serving students, housing equipment, and preparing labs. For example, most classroom laboratories were originally designed by a former chemistry faculty member, resulting in unnecessary sinks in the center of each lab bench, and holes in all

the laboratory tables (for the assembly of metal frameworks to hold chemistry equipment) – both of which reduce bench space that could be used for additional set-up materials and equipment. Although efforts to create smart lab classrooms have positively resulted in the installation of computers at most benches in teaching labs, the poor design of bench space makes it difficult to incorporate computer-based programming efficiently into the laboratories. Finally, even though many large, modern pieces of equipment have been recently acquired for teaching (e.g., cell biology tissue culture hood, specialty incubators, fluorescence microscope), current lab layouts cannot accommodate these items because of space and / or infrastructure issues. Adjoining lab preparation and storage rooms are likewise poorly designed, filled to capacity with equipment, and – most problematically – contain equipment (e.g., dishwashers and stoves) that are not working and / or out-dated. Major remodels of the laboratories would alleviate many of these issues and would lead to more efficient use of laboratory space.

In terms of faculty office space (including, in some cases, back room research space), the Natural Science Building is filled to capacity, which obviously poses a major challenge to housing new faculty. Indeed, one recently-hired tenure-track Biology Faculty member currently lacks an office with back room research space. Given that it is unlikely a new science building (the most logical long-term solution) will be built in the near future, office and research space problems need to be addressed through existing building renovations to create office space. Specifically, cleaning up and redesigning storage and lab preparation rooms could add new office space for existing lab preparators, thus freeing up offices for faculty. Additionally, such renovations would allow for better equipment management and storage, including the development of shared research spaces that would provide a better alternative to back room research space.