Introduction

Few of the College of Southern Nevada (CSN) students I interact with consider careers in field biology. When asked why, most report they do not know much about field biology because too few opportunities exist. Knowing this, and the importance of attracting students to STEM careers, I solicited input from potential employers and developed a new course called Introduction to Field Biology (BIOL 211). BIOL 211 was approved by the Nevada System of Higher Education (NSHE) during 2012 and I offered it for the first time during the spring semester of 2013. It is a 4-credit lecture/lab course that meets six hours per week. The assessment plan for BIOL 211 is summarized in Table 1.

Eleven sophomores and juniors enrolled in BIOL 211 during spring 2013. All maintained 4-14 credits of science and math and most worked an average of 30 hr per week.

Course Overview

BIOL 211 is organized into lectures (e.g., field safety, geospatial data, fieldwork), demonstrations (e.g., RFID tag reading, telemetry, post-correction of GPS data), on-campus exercises, off-campus field excursions, and major field projects. I limited the number of lectures in the course to yield more time for hands-on learning. Geospatial data are an integral part of field work. Consequently, this topic was addressed thoroughly in the course (Figure 1).

On-campus Exercises included:
1. Pacing 100 meters
2. Topographic map reading
3. Using a Silva® Ranger 515 compass for transects, slope, and aspect
4. Using Garmin® Rino® 650 and Trimble® Juno® 3B GPS receivers to collect geospatial data, navigate, and enter field data into a data dictionary
5. Measuring with rulers, tapes, calipers, spring scales, map tools, etc.
6. Use of ESRI® ArcMAP® 10.0 and IBM® SPSS® V. 21 software
7. Mock tortoise transects using U.S. Fish and Wildlife Service 100% coverage and probabilistic sampling protocols and tortoise replicas

Off-campus Field Excursions

Students participated in two field excursions to practice field safety, develop field appropriate behaviors, and to learn how to key out taxa.

1. Plant identification at a field site near Jean, NV
2. Visual encounter survey and lizard identification on the Boulder City Conservation Easement

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Student Challenges (data derived from exit survey responses; n=11)
1. 5/11 reported how challenging it was to wake up on time
2. 4/11 reported how challenging it was to work in the field because of poor fitness level and rough terrain
3. Others reported lack of understanding of statistics, using a compass, and taking care to eat and drink enough while working in the field

Successes (most data derived from exit survey responses and final exam; n=11)
1. 10/11 were very satisfied with their decision to enroll in BIOL 211
2. 9/11 were extremely likely to recommend the course to others
3. 6/11 had their first experience with research while in BIOL 211
4. 11/11 had their first experience using statistics to interpret research data
5. Most reported that after completing BIOL 211 they are now likely or extremely likely to pursue field biology, graduate school, and research
6. Most reported moderate to major improvement in field skills (e.g., items 1-5 in On-campus Exercises); skills retention performance support perceived improvement
7. Numerous learning opportunities from field observations (e.g., explaining the most likely reason for why a lizard was impaled on a Yucca leaf)

Final Thoughts

The positive impacts BIOL 211 has had on its first cohort of students make it worthwhile to continue to offer the course and address its challenges. Early data suggest the course will attract more local students to careers in field biology or other STEM careers. BIOL 211 will be offered again during Spring 2014.