

# Eastern Wyoming College

## **Instructional Program Review 2015-2016**

### **Program: Science Department**

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## Science Department Program Review

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### Part I: Statistical Data from the past three years:

Science <u>Degree</u> Statistics (Biol, Env. Sci, and Wildlife A.S.)	2012-2013	2013-2014	2014-2015	5-Year Average
# Students Majors	16	12	8	10
# Degrees Conferred	0	1	2	1

Science <u>Department</u> Statistics	2012-2013	2013-2014	2014-2015	5-Year Average
Annualized FTE Enrollment	87.2	96.9	89.2	94.0
Annualized FTE Faculty	6.3	7.5	7.6	6.8
Annualized FTE Enrollment by Science Department				
Biology	56.2	60.2	55.0	59.9
Botany	0.0	0.0	0.0	0.0
Chemistry	16.0	17.3	19.2	15.9
Geology	4.4	2.5	4.3	3.5
Molecular Biology	1.9	3.8	2.3	2.2
Physics	1.7	1.7	0.0	1.5
Zoology	7.2	10.4	8.5	11.0

FTE = Full-time equivalent

Modes of Delivery:

online       compressed video       face-to-face

Budgets:      Educational Supplies \_\_\_\_\_      Travel \_\_\_\_\_

Student Access Points:

Our students are largely first semester traditional students, but include a few non-traditional and transfer students as well.

### **Part II Narrative Analysis**

#### **Description of Community Need/ State and National Trends:**

The major role of the Science Department is to provide science instruction for students who plan careers in health care fields, agriculture, science education, engineering, veterinary medicine, and animal science. Science department courses also serve to meet the “lab science” science requirement for graduation from EWC and four-year transfer institutions. Science department courses represent 7.6% of EWC’s 5-Year Average Annual FTE enrollment.

The Science Department now offers two degree programs -- A.S. Degrees in Biology, and Wildlife and Fisheries Biology and Management. The Environmental Science option was removed from the catalog as of the 2015-16 academic year. Enrollment in these degree programs is relatively low – 5 year average is 10 majors. However, this number is likely to

increase with the implementation of the new 2+2 articulation agreement with the University of Wyoming.

### **Activities in Support of Student Recruitment and Retention**

Science Department faculty members are concerned about low enrollment in sophomore level science courses such as Organic Chemistry and Physics. Because many students come to EWC under-prepared for taking college level math and science courses, they often cannot take the freshmen level courses until their second year (after having fulfilled the math pre-requisites on the science course).

It is hoped that efforts could be focused on recruiting Science Majors who are academically prepared to take college level math and science courses (i.e. those with higher ACT scores) as freshmen. These efforts could be aided by offering scholarships early in the Spring to academically well-qualified Science Majors as they are making decisions about which college to attend.

Though Science Division scholarships are primarily awarded to incoming freshmen, each year a few are awarded to returning students to encourage retention of those students who have been very successful in their freshman science and math coursework. EWC also awards several NASA Space Grant scholarships to help retain Science Majors.

EWC's Undergraduate Research Program was re-established in 2013 and is funded via a Wyoming INBRE grant from the NIH. The course work associated with this program has given a 1-2 students a year the opportunity to participate in a significant research project. It is hoped that the availability of an undergraduate research opportunity will make EWC's science degree programs more appealing to students.

### **Assessment of Student Learning:**

There have been three A.S. degrees conferred in Biology, Environmental Science, and Wildlife and Fisheries Biology in the past two years. Although this number is low, it is expected to increase with the new 2+2 articulation agreement which was implemented at the beginning of the 2015-16 academic year in collaboration with the University of Wyoming. Assessment of Student Learning in Science courses is conducted through Classroom Assessment Tools (CATs), Course Assessments, student grades, and rubrics as part of the Outcomes Assessment of our Pre-Professional graduates.

### **Strengths of the Program and Faculty:**

EWC's Science classes are typically small, allowing for one-on-one instruction. Labs are taught by the lecture instructors (rather than teaching assistants), so lab instruction is of high quality and reinforces lecture topics.

EWC Science Department offers BIOL 1000 (Principles of Biology), BIOL 1010 (General Biology I), BIOL 2020 (General Biology II), and MOLB 2210 (Pathogenic Microbiology) online to allow students in our Outreach sites to take science courses. Science courses (primarily BIOL 1000 and CHEM 1000) are offered through concurrent enrollment, and EWC faculty members have been meeting annually with the High School instructors who teach them to help ensure that these courses are equivalent to the on-campus experience.

The Science Department has highly qualified and hard working faculty members who work well together. The science faculty members attend state articulation conferences in Biology, Physics and Chemistry when they are held, and continue to incorporate new technologies in their laboratories as budgets allow.

### **Part III Recommendations**

#### **Faculty Recommendations:**

EWC needs to continue to offer a wide range of courses for students in science majors to facilitate our students' entry to, and success in, transfer and professional programs. Also, to best serve our students, the faculty needs to continue professional development activities, and maintain articulation with other college science programs.

Laboratory supply budgets need to increase annually to keep up with rising costs of materials and shipping.

Recruitment of quality "math & science ready" students continues to be an important goal. Additional numbers of academically well prepared science students at EWC would benefit the college in a variety of ways. Their increased numbers would improve enrollment in our second year science and math courses. Since many of these students are high-achieving students, they often serve as our tutors in the Learning Skills Lab, and their presence in EWC's General Education classes raises the overall quality of classroom interaction.

Despite the current low student enrollment in the Biology, Environmental Science, and Wildlife and Fisheries Biology and Management degree programs, it is believed that student numbers will increase in the next few years with the new 2+2 articulation agreement. Four students have already enrolled for the Fall 2016 semester, and five more have recently visited our campus and expressed strong interest in the programs.

#### **Division Chair Recommendations:**

1. The quality and variety of course offerings for students majoring in the sciences needs to continue. While several courses have been dropped from the catalog, others have been added which have better addressed the needs of students transferring to the University of Wyoming and Chadron State College. Faculty need to continue to attend annual conferences, workshops, articulation meetings and continue to participate in the INBRE program.
2. Budget allocations for supplies and equipment need to be maintained or increased to reflect their increased cost and continual need to replace items as they become outdated or diminish through attrition.
3. Enrollment in Biology, and Wildlife and Fisheries Biology and Management degree programs is gradually increasing, and has been enhanced by the recent 2+2 articulation agreements with the University of Wyoming. While these small increases have been encouraging, efforts to recruit students who demonstrate a high aptitude in science and mathematics needs to be increased by offering scholarships or other forms of incentive.

Science Faculty work together well as a team, and should continue to collaborate to offer a high quality and variety of courses.

**Vice President's Recommendations:**

With respect to faculty and Division Chair recommendations, professional development is extremely important to the effectiveness of the Science Program and I encourage the faculty to develop a professional development plan for the next three years and report out progress annually.

While the faculty and Division Chair make correct statements regarding the need to increase the supply budget, this recommendation is not in their control, especially in this time of diminishing budgets.

Next, the faculty identify recruitment of quality “math & science ready” students as a goal. This is a worthy goal and I recommend that the faculty develop strategies for the next three years on how to accomplish a specific recruitment goal in collaboration with the recruitment office.

Lastly, the faculty identified low enrollment. With directives from the Board of Trustees and the President, the Science Program will need to focus on retention and completion. That being said, the FTE generated in Science has steadily declined over the past three years. This statement of fact is not meant to be a criticism of the faculty, more an observation of the ebb and flow of the economy. Even so, faculty have a responsibility to recruiting in addition to retention.

Interestingly, there has been a 20% increase averaged over the past three years of students declaring a Science major compared to the previous three-year period, however, the student completion rate has remained stagnant an average of 1% over the both three year periods.

Therefore, it is my opinion that Science faculty:

- consider developing strategies to retain students in major and those taking courses to fulfill general education requirements.
- consider developing strategies to increase the number of majors completing each program

As we evolve program reviews into meaningful documents, some of these recommendations will naturally occur.