

Implementation of Assessment Recommendations: BIOL/CHEM

Introduction

During Summer 2018, a meta-analysis was completed of assessments from Dr. Carman's accelerated BIOL 190/L, 223, 224 and 251 courses, as well as traditional 16-week CHEM 121 courses, spanning multiple years [1, 2]. This report delineates actions taken as of 23 September 2018 in response to a variety of recommendations based upon assessment results.

Note should be made that the data used in both previous assessment reports had one substantial limitation: reports were drawn from Canvas after the courses were completed and thus, students who withdrew during the semester were not included in data reports as they were removed from Canvas. Downloading Excel spreadsheets daily was an unrealistic option, both in terms of time commitment and data storage. Although this skewed data slightly, it was overall, reliable.

Data utilized from myWNC reflected student enrollment and performance after the even-exchange period and, hence, was likewise subject to a small degree of inaccuracy. Since these inaccuracies were consistent, they negate each other, as what also happens in scientific research.

Recommendations Implemented or in the Process of Implementation

CHEM 121 Recommendations

- 1) *Remove CHEM 121 as a pre-req for BIOL 223 and BIOL 251 per NSBE/Q 8 results. In addition, the Bio-organic CHEM and Cell Biology sections offered in this course by this faculty member simply do NOT support BIOL 223, 224 or 251 adequately like BIOL 190/L does.*

Articulation Forms signed by all five BIOL/CHEM full time faculty were e-submitted to the Interim Liberal Arts Director on 21 and 22 (to correct clerical typos) September 2018 removing CHEM 121 as a pre-requisite course for BIOL 223 and BIOL 251. Furthermore, once CHEM 121 is removed as a pre-requisite for these two courses, the Bio-Organic CHEM and Cell Biology topics will be removed from Dr. Carman's CHEM 121. This will return the course to a traditional CHEM 121 p. 5 of 29 [2], which will no longer provide a modicum of support to students to be successful in BIOL 223 and BIOL 251 vis-à-vis CHEM 121. The student learning outcomes will remain the same and adjusted topics will align with national standards for introductory chemistry.

These course changes are tentatively directed for WNC Curriculum Review in the October 2018 meeting. The Interim Director has e-expressed support and signature for movement to the Interim VPASA on the path to the Curriculum Committee.

In addition, Dr. Gary Schwartz has graciously agreed to offer an accelerated, 8-week, CHEM 121 MATH pre-requisite course in Fall 2019 and Spring 2020 which will predate an accelerated CHEM 121 offered in the second 8-weeks of the semester as suggested, previously, p. 10 of 29 [2]. The accelerated CHEM 121 days, dates and times were submitted to the WNC Scheduler, Ms. Sierra Montana, on Aug 17, 2018, 9:29 AM and receipt was noted by same on Aug 17, 2018, 9:59 AM. Those proposed dates are as follow:

Fall 2019

MW 1600-1845 for lecture and 1900-2145 MW for lab -- both in 201 ASP, 28 Oct 2019-11 Dec 2019.

Spring 2020

MW 1600-1845 for lecture and MW, 1900-2145 for lab -- both in 201 ASP, 23 Mar 2020-13 May 2020.

The email regarding these dates was shared with both Ms. Montana and Dr. Schwartz on Aug 20, 2018, 11:03 AM.

At present, data obtained from WNC's Office of Institutional Research regarding the MATH pre-requisite are being analyzed against the CHEM 121 final course outcome for purposes of assessment. In addition,

1 reading assessments are currently being obtained in CHEM 121 for assessment purposes. Preliminary
2 data indicates that over half of the current CHEM 121 class finds reading at the 9th grade level too difficult.

3 BIOL 190/L and 191/L Recommendations

4 1) *Course organization/structure requires some modifications to aid students in*
5 *knowledge retention for improved student success by re-joining BIOL 190 with BIOL 190L*
6 *(and the 191 sequences, as well) to make a 4-credit course as it was pre-BIOL 190, 191*
7 *and 192 “conversion” in the 1990’s by UNR, in line with CHEM 121 and PHYS 151. Pp. 6 of*
8 *30 [1].*
9

10 Two different proposals were brought forth to [re-]join the separate BIOL 190 lecture (3 credits) with 190L
11 (1 credit) and BIOL 191 lecture (3 credits) with 191L (1 credit) into their own respective 4-credit courses.
12 Either the 190, 190L and 191, 191L courses would combine into 4-credit classes (no separate 1-credit labs),
13 following the model used in BIOL 223, 224, and 251, and CHEM 121, or the BIOL 190/L and 191/191L
14 would be discontinued and replaced with BIOL 196 and BIOL 197, respectively, as implemented at UNLV.
15 Electronic and face-to-face discussions among all the full-time BIOL/CHEM faculty between Spring 2018
16 and early Fall 2018 led the group to conclude that the latter recommendation (deactivating the four (4)
17 courses (BIOL 190/L and 191/L) and bringing BIOL 196 and 197 from UNLV to WNC’s campus) would be
18 more effective. The BIOL 196/197 sequence is comparable in student learning outcomes to BIOL 190/191,
19 they are transferrable to UNLV as BIOL 196 and 197 and, furthermore, are transferrable to UNR as fulfilling
20 BIOL 190, 191 and 192.

21
22 The “add-campus forms” for BIOL 196 and 197, as well as the deactivation articulation forms for BIOL
23 190/L and 191/L, were signed by all five BIOL/CHEM full time faculty and were e-submitted to the Interim
24 Liberal Arts Director on 21 and 22 (to correct clerical typos) September 2018. In addition, the BIOL 196
25 and 197 labs are combined with the BIOL 196 and BIOL 197 lectures in such a manner that students
26 enrolled in a lecture will receive instruction in lab by the same faculty member and the content will be
27 congruent between the two (lecture and lab). This will ultimately increase student success in general
28 education biology courses [196 and 197].
29

30 While this is primarily an **academic alteration**, this also alleviates no-small-amount of administrative
31 impact; such that course registration complications are minimized when students must choose a lab
32 aligned with certain lectures (i.e. lecture and lab schedules are more closely aligned, or students do not
33 enroll in accelerated lab with 16-week lecture, etc.). Faculty can/will better prepare students in classes
34 by removing some unexpected or unaccounted-for teaching or learning activities used to bring students
35 up to par with scheduled content in the course outlines.
36

37 These course changes are tentatively directed for WNC Curriculum Review in the October meeting. The
38 Interim Director has e-expressed support and signature for movement to the Interim VPASA on the path
39 to the Curriculum Committee.
40

41 2) *Between BIOL 251 and BIOL 223 (Christmas Break), students demonstrated a 38%*
42 *reduction in BIOL 190/L content/knowledge transfer. Between BIOL 223 and BIOL 224*
43 *(Spring Break), there was no similar loss of BIOL 190/L content/knowledge.*
44

45 This content loss (Recommendation 2, above; pp. 10 of 30 [1]) impacts appropriate concept internalization
46 and application in-and-for BIOL 223 and 224. Hence, the following composite schedule to “combat” this
47 degree of content loss was submitted for Fall 2019 and Spring 2020 on Aug 17, 2018, 9:29 AM To Ms.
48 Sierra Montana, WNC’s Scheduler and various and sundry WNC administrators:
49

50 BIOL 190 – Aug 12, 2019 – Oct 3, 2019 – T/R 1600-1845 – Majority falls in Fall Semester

51 *Now BIOL 196 – this will be adjusted ASAP

52 BIOL 190L – Aug 12, 2019 – Oct 3, 2019 – T/R 1900-2145 – Majority falls in Fall Semester

53 *Now BIOL 196L, albeit part and parcel of BIOL 196 – this will be adjusted ASAP

54 BIOL 251 – Oct 7, 2019 – 26 Nov, 2019 – T/R 1600-1845 – All in Fall Semester

55 BIOL 251L – Oct 7, 2019 – 26 Nov, 2019 – T/R 1900-2145 – All in Fall Semester

56 BIOL 223 – 2 Dec 2019 – 7 Feb 2020 – T/R 1600-1845 – Majority falls in Spring Semester

57 BIOL 223L – 2 Dec 2019 – 7 Feb 2020 – T/R 1900-2145 – Majority falls in Spring Semester

1 NOTE: Students get X-mas break/New Year's the **20th Dec 2019 through 5th Jan**
2 **2020**. This accommodates students' family needs and reduces the Christmas Break to 2
3 weeks rather than 5-6 weeks of time spent losing BIOL 190/L (196) knowledge/content.

4 BIOL 224 – Feb 10, 2020 – 3 Apr 2020 – T/R 1600-1845 – All in Spring Semester

5 BIOL 224L – Feb 10, 2020 – 3 Apr 2020 – T/R 1900-2145 – All in Spring Semester

6 The preceding courses are 8-week long courses.

7 What follows is a **6-week** course:

8 BIOL 251 – Apr 6, 2020 – 15 May 2020 – T/R 1400-1745 – All in Spring Semester

9 BIOL 251L – Apr 6, 2020 – 15 May 2020 – T/R 1800-2145 – All in Spring Semester

10
11 This proposed schedule continues to allow pre-NURS students to have a choice to complete all of their
12 pre-requisites and co-requisites in one academic year as opposed as completing them in 2-4 years.
13 Furthermore, ALL courses meet the accreditation requirements of "seat time", hence the "hinky" hours
14 for the 6-week course (BIOL 251, above).

15
16 At present, reading assessments are currently being obtained in BIOL 190/L for assessment purposes.
17 Preliminary data indicates that just under a third of the current BIOL 190/L class finds reading at the 9th
18 grade level too difficult. Discussions with two other faculty suggest that the issue between the two
19 courses may be that the CHEM students are simply more numerically-oriented than the BIOL 190/L
20 students. This will require further, and on-going, analysis. Reading is just as important in CHEM as it is in
21 BIOL.

22
23 At the time of this report, there are no other recommendations that have been reviewed. BIOL 190 is
24 being assessed this academic year (Fall 2018) in BIOL 251 to provide more insights as to its importance in
25 BIOL 251.

26 27 Conclusion[s]

28
29 At present there are three (3) recommendations from BIOL 190/L and 191/L and CHEM 121 assessments
30 performed by Dr. Carman that have been addressed, vis-à-vis submission into the WNC process of
31 assessment implementation: pre-requisite course changes, course deactivations, and courses added to
32 the WNC institution for instruction. Upon implementation of these submissions, student academic
33 success in these courses "should" improve.

34 35 Submitted by

23 September 2018

36
37
38
39 Dr. Steve Carman
40 Professor of Biophysical Sciences

Date

41 42 Addendum, 18 October 2018

43
44 As indicated above, upon Reading Assessment data review by Drs. Carman, Evett and Morin, it appeared
45 that it might be possible that CHEM 121 students were more "numerically oriented" than "reading
46 oriented" compared to the BIOL 190/L students.

47
48 MATH was not assessed by examination in BIOL 190/L as it is in CHEM 121. Both courses, however, DID
49 complete five MATH worksheets based on identical MATH content as homework. The figure, on the
50 following page, summarizes that, as far as homework performance was concerned, there was no
51 statistically significant difference observed across all five MATH assignments. Indeed, there appear to be
52 more similarities than there are differences between the two groups that have two different levels of
53 MATH pre-req's or co-req's:

1 Starting Fall 2019, MATH will be assessed in BIOL
 2 190/L (eventually 196) as it is in CHEM 121 (by
 3 identical exam) to follow up on this issue.

4
 5 In addition, requests regarding the actual grade
 6 level of the reading placement exam cut-off scores
 7 currently in use at WNC have been met with non-
 8 responses. At this time, therefore, it's difficult to
 9 truly assess reading in either BIOL 190/L or CHEM
 10 121 in such a manner as to confirm or reject the
 11 validity of the placement exam cut-off scores for
 12 guidance of students into either remedial reading
 13 courses or to advance properly prepared students
 14 into courses that require college level reading.

15
 16 The Cloze method used by Dr. Carman has over 60
 17 years of validation and application; right on par
 18 with the Flesch-Kincaid and Flesch methods.
 19 Previous reading assessments [3] have
 20 demonstrated comparable reading-related issues
 21 between BIOL and CHEM students. Further
 22 assessments will be required to determine if the
 23 Fall 2018 data are anomalous or a new trend.

24
 25 Submitted by



27 18 Oct 2018

28 Dr. Steve Carman
 29 Professor of Biophysical Sciences

