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

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

BIOL 190/L and 191/L Recommendations

1) Course organization/structure requires some modifications to aid students in
knowledge retention for improved student success by re-joining BIOL 190 with BIOL 190L
(and the 191 sequences, as well) to make a 4-credit course as it was pre-BIOL 190, 191
and 192 “conversion” in the 1990’s by UNR, in line with CHEM 121 and PHYS 151. Pp. 6 of
30 [3].

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

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

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

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

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

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

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

*Now BIOL 196 – this will be adjusted ASAP

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

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

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

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

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

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

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

BIOL 224 – Feb 10, 2020 – 3 Apr 2020 – T/R 1600-1845 – All in Spring Semester
BIOL 224L – Feb 10, 2020 – 3 Apr 2020 – T/R 1900-2145 – All in Spring Semester

The preceding courses are 8-week long courses.

What follows is a 6-week course:

BIOL 251 – Apr 6, 2020 – 15 May 2020 – T/R 1400-1745 – All in Spring Semester
BIOL 251L – Apr 6, 2020 – 15 May 2020 – T/R 1800-2145 – All in Spring Semester

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

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

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

Conclusion[s]

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

Submitted by

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Date

23 September 2018

Addendum, 18 October 2018

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

MATH was not assessed by examination in BIOL 190/L as it is in CHEM 121. Both courses, however, DID complete five MATH worksheets based on identical MATH content as homework. The figure, on the following page, summarizes that, as far as homework performance was concerned, there was no statistically significant difference observed across all five MATH assignments. Indeed, there appear to be more similarities than there are differences between the two groups that have two different levels of MATH pre-req’s or co-req’s:
Starting Fall 2019, MATH will be assessed in BIOL 190/L (eventually 196) as it is in CHEM 121 (by identical exam) to follow up on this issue.

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

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

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