# General Education SLOA Summary

General Education Category_**Physical and Life Science**_ Semester: _**FA 13/SP14**

**Data Summary:** ***(See chart attached)***

- In **Academic Year 2014** (FA12 and SP14), there were **25** general education science courses offered (Biology = **11**; Biotechnology = **1**; Chemistry = **3**; Physical Science **5**; Physics **5**). A set of assessment questions has been developed for **16** of these courses and these assessments were administered with final exams for the Spring 2013 semester to most of the sections of students completing these courses.
- A total of **2257** students registered for these **25** gen ed courses and **1855** students completed these courses which is **82.2%** of the registered students.
- Of the 2257 active students **1303** students completed the course Gen Ed assessment (**57.7%**) and of the 1855 completers, **70.2%** took the course Gen Ed assessment.

**What is being assessed?**

All of the General Education assessments were designed to measure scientific reasoning as defined by the following learning outcome for the Physical and Life Science general education area:

***The ability to access, process, analyze and synthesize scientific information***

The assessments are usually 5 – 10 multiple choice questions which involve reading a case study or paragraph filled with data or solving a problem using course content. They were developed by the course instructors and are included with the final exam or embedded in exams during the course.

- Courses which still do not have assessments in place include: BIO 112 and PHS 111 . These courses have recently been reassigned to different instructors and assessments will be completed in Fall 2014.
- There were several Courses which had assessments in place but did not submit data. See attached Data Summary or specifics. This problem is instructor-specific and by Spring 2015 we should have 100% of Science completers taking the gen ed assessment for their course.
- Data was submitted by instructors to the Y drive on their COGS for FA 2013 and SP 2014. The data is then accessed by the Division Office Associate and Division chair and requires that the each COG be checked in order to complete this report. This is a time-consuming process which will be shortened tremendously by the implementation of the Science Assessment Database, "Einstein" being piloted in FA 2014.
- Specific issues with the relationship between gen ed assessment process and COGS includes:
    - Gen Ed assessments were not always separated from overall common course assessments so faculty was instructed to clarify the course common assessment vs. the Gen Ed assessment
    - Some COGS have too many learning outcomes and they are redundant. These courses are being revisited.
    - Item analysis did not always relate the question to the learning outcome.
- The database project that faculty are working on with R. Kendrick will solve most of these problems and issues.
- Because in most cases, assessment questions have **not** been aligned with the stated learning outcome for the content area (Physical and Life Sciences), this will be on the agenda for the January Workshop when full-time and some adjunct faculty are present.
- CAAP Exam in Scientific Reasoning was administered to 81 students in BIO 106, BIO 110 (Web) and CHM 101. HCC mean score = 58.0 ± 3.3 vs. National mean score = 59.2± 4.2 (N=2-602).

**Discussion of Analysis Results:** (narrative in Word format of **who, what, where, when, what** was discussed and what was determined)

**Who**: Full-Time faculty have completed Gen Ed Assessments for all of their courses which satisfy Gen Ed requirements. For courses taught only by adjunct faculty, these instructors have developed and implemented assessments except for two courses, BIO 112 and PHS 111. These adjunct instructors have been contacted and given directions on what is needed and when the assessment should be implemented.

**What:** **92%** of the **AY 2014** Gen Ed courses in the Science area administered assessments to more than **1303** students during the final exam periods in Fall 2013 and Spring 2014. This was only **57.7%** of the Science Gen Ed enrollees (1303/2257) for 2014 but it was **70.2%** of the Science Gen Ed completers (1303/1855) The assessments measured how well students achieved the Gen Ed Learning Outcome ***The ability to access, process, analyze and synthesize scientific information.***

CAAP testing was administered in Fall 2013 in 3 Gen Ed courses (N= 81 students). The specific courses were BIO 106, BIO 110 (web) and CHM 101.

The BIO 104 assessment was benchmarked by the HAPS exam. THE CHM 103 and 104 courses were benchmarked with the ACS exam for General Chemistry I and II.

**Where:** The assessments were administered in the classroom as supplements to final exams or in the Testing Center if the final exam was given in the Testing Center, including the on-line course BIO 110. CAAP testing was done in the Testing Center in order to meet the stringent requirements of the ACT. Participation of students in CAAP testing was significantly improved vs. 2013 because the courses to be tested were selected in advance and instructors were required to include this testing requirement on their Master syllabi/Course Guidelines.

**When**: Most of the assessing for both semesters was done during the final exam period. Analysis of the data was done at the end of the semester but there were instructors who did not submit anything until several months after the due dates. The use of the new database "Einstein" should take of these problems.

**WHY:** This whole SLOA process is done to increase student learning and this is a weak spot in the process to date, at least in this division. We are finally getting data from every Gen Ed course, but item analyses are not included very often on the COGS. With the new database, this will be addressed by linking the questions on the assessments to the Gen Ed expected learning outcomes for the Science Area. This should bring the Science course level assessment to a whole new level to this initiative.

**Plan of Action: (closing the loop)**

- Develop and implement the Einstein Course database and pilot for Fall 2014.
- Analyze 2014 data and find at least ONE weak content area that should be address in the delivery of the course for 2015.
- Most changes will be made to course content or course design as described on the COGS for each course.
- More benchmark assessments will be identified and used in as many courses as possible

## Data Summary for Science General Education Assessment, AY 2014

| Approved Gen Ed Course | Assessment tool on file | Fall 2013 Data | Spring 2014 Data | COG |
|---|---|---|---|---|
| BIO 101: Gen Biology I (4 cr) | 5 Questions BIO | N=125<br>73.9% | N=80<br>88.5% | FA13, SP14 |
| BIO 102 Gen Biology II (4cr) | 8 questions | NA | N=27<br>74.5% | SP14 |
| BIO 103: A&P I | 5 questions BIO | N=27<br>76% | N=91<br>71.6% | SP14 |
| BIO 104: A&P II | 5 questions NEW; HAPS N=84; mean score = 58.94 ±14.54 | N=16<br>75% | N=88<br>70% | SP14 |
| BIO 106: Unity/Diversity of Life | 5 Questions BIO | N=41<br>75.8% | N=42<br>69.2% | SP14 |
| BIO 110: Human Biology | 5 Questions BIO | N=117<br>62.3% | N=97<br>68.2% | FA14 |
| BIO 111: Contemporary Issues (on-line course) | 7 questions with graph for interpretation | N=15<br>73.2% | N=10<br>64.3% | |
| BIO 112: Biology of Disease (on-line course) | Need to develop | Will be developed and administered for FA 2014 | | |
| BIO 113: Principles of Biology I | 5 Questions BIO | N=18<br>96.6% | Not offered | FA13 |
| BIO 114: Principles of Biology II | 8 questions | Not offered | N=14<br>84.6% | SP14 |
| BIO 205: Microbiology | 5 Questions Micro | None | None | SP13 needs updating |
| BTC 101: Intro to Biotechnology | 5 Questions BTC | Missing data | Missing data | FA14 |
| CHM 101: Intro College Chemistry | 8 Questions CHM | N=69<br>69% | N=86<br>65.0% | SP14 |
| CHM 103: General Chemistry I<br>ACS Exam = 33.1 vs. 37.1 national mean | 10 Questions CHM | N=45<br>86.1% | N=22<br>75.9%<br><br>33.8 vs. 37.1 | SP14 |
| CHM 104: General Chemistry II<br>ACS exam = | 10 Questions CHM | N=17<br>33.4 vs. 36.2 | N=22<br>41.9 VS. 36.2 | |

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|---|---|---|---|---|
| 42.6 vs. 36.2 national mean | | | | |
| PHS 104: General Physical Science | 9 Questions PHS 104 | N=38<br>(6/9) = 66.7% | N=41<br>(6.39/9) = 71.0% | FA13/SP13 |
| PHS 105: Descriptive Astronomy | 8 Questions PHS 105 | Not offered | N=34<br>68.0% | SP14 |
| PHS 107/108 Intro Physical Geology | 10 Questions PHS 107 | No data | N=32<br>9.0 | SP14 |
| PHS 109 Meteorology | 7 questions PHS 109 | N=33<br>6.1/7 = 87.1% | N=28<br>5.7/7 = 82% | SP14 |
| PHS 111 Earth/Space Science | No assessment available | Not offered | Will be developed and administered for SP 2015 | SP14 |
| PHY 112: Applied Physics | Two problems on electrical circuits graded with rubric | Not offered | N=14<br>Median 85% | Needs COG to go with data summary |
| PHY 201: General Physics I | No offered in Spring | N=21<br>Median 79% | Not offered | Needs COG to go with data summary |
| PHY 202: General Physics II | Two problems (circuits and optics) graded with rubric | Not offered | N=12<br>Median 88% | Needs COG to go with data summary |
| PHY 203: Principles of Physics I | Not offered in Spring | N=34<br>Median 74% | Not offered | Needs COG to go with data summary |
| PHY 204: Principles of Physics II | Two problems (circuits and light) graded with rubric | Not offered | N=26<br>72% | Needs COG to go with data summary |