Example of Annual Assessment Form

SJSU Annual Program Assessment Form
Academic Year 2013-2014

Department: Chemistry
Programs: BS Chemistry
BS Chemistry concentration Biochemistry
BA Chemistry
College: Science
Website: http://www.sjsu.edu/chemistry/
X Check here if your website addresses the University Learning Goals.
(See http://www.sjsu.edu/chemistry/Academic_Programs/index.html, in particular)
Program Accreditation: American Chemical Society (BS Chemistry degree only)
Contact Person and Email: Chair Gilles Muller (Gilles.Muller@sjsu.edu)

2013 is not the typical average for the Department of Chemistry. Skewed one semester data is expected to lead to poor analysis.

b) Historical data is needed to detect possible patterns since the typical time to degree for an incoming freshman in STEM is well over four years and over three years for a transfer student.

c) It is also important to note that an understanding of how some of the data is calculated by the SJSU Institutional Effectiveness and Analytics Office is also important to interpret possible patterns, so some comments will be included in each section, as needed, to clarify.

Graduation Rates for Total, Non URM and URM students (per program and degree)

Table 2 – Graduation Rates for Total, Non URM and URM Undergraduate Chemistry Students

	)LUVW WLPH IUHVKPDQ		7UDQVIHU	
&RKRUW	\HDU	\HDU	\HDU	\HDU
)				
)				
)		1$		
)		1$		
)	1$	1$		
)	1$	1$		1$
)	1$	1$		1$

$YHUDJH &KHP
6-68

	1RQ 850)LUVW WLPH IUHVKPDQ		1RQ 850 7UDQVIHU	
&RKRUW	\HDU	\HDU	\HDU	\HDU
)				
)				
)		1$		
)		1$		
)	1$	1$		
)	1$	1$		1$
)	1$	1$		1$

$YHUDJH &KHP
6-68

	)LUVW WLPH 850 IUHVKPDQ		850 7UDQVIHU	
&RKRUW	\HDU	\HDU	\HDU	\HDU
)				
)				
)		1$		
)		1$		
)	1$	1$		
)	1$	1$		1$
)	1$	1$		1$

$YHUDJH &KHP
6-68

when the majors had over 120 units. Now all Chemistry majors are at 120 units so some changes in the time to graduation are expected but it will be a while before these new cohorts graduate. c) Students change majors so the data for the first time freshman can and will reflect students who might have entered SJSU as chemistry majors and changed their majors prior to even taking a chemistry class maybe as a result of not passing a math class or finding some other course work they were passionate about.

Analysis – A few important clarifications are needed to help in understanding the data. It is not surprising that the difference between 6 and 8 year rates for new freshman and between 3 and 5 year rates for transfer students are larger for Chemistry than for SJSU. First it is important to note that chemistry is a difficult major and not a very large major at SJSU. Thus upper division courses tend to be offered just once a year, not every semester. When this is combined with the prerequisite structure it is not uncommon for a chemistry student to have to stay at SJSU for an additional year. If the student happens to not obtain a C or better in an upper division course and needs to repeat, it could also add another year. Students needing remediation in Math or English would also find it difficult to graduate in a timely manner because Chem 1A will not admit remedial students. For transfer students the difference is larger because some transfer with 60+ units but very few to no chemistry classes, so they would still have as many as four years of chemistry course work left. Finally, Chemistry is a laboratory science. Many students get involved in undergraduate research so as to gain more hands on experience and be better prepared for their careers and to be better applicants for graduate and professional school. Undergraduate research can add time to their degree.

The six year graduation rate average for first time freshman for the Chemistry Department and for SJSU are comparable. The 8 year graduation rates are higher for Chemistry, but again recall that this does

Females are also considered underrepresented in physical sciences. Staring in Fall 2010 the % of majors in chemistry who are female has been above 50%. The average 6 year and 8 year graduation rates for first time female freshman in chemistry are 50.8 and 74.8, respectively. The average 3 year and 5 year graduation rates for female transfer students is 24.2 and 55.9, respectively. These data are averaged over the same cohorts as in Table 2. The rates for females are a little better than males in chemistry.

Headcounts of program majors and new students (per program and degree)

Table 4 – Headcount of New Students to the BA/BS Degree Programs in Chemistry

%\ 7\SH	6)	6)	6)	6)	)6	)DOO $YHUDJH
)LUVW WLPH)UHVKPDQ			1$	1$	1$	1$
7UDQVIHUV		1$				
7RWDO		1$				

%\ 0DMRU	6)	6)	6)	6)	)6	)DOO $YHUDJH
%$ %6 &KHPLVWU\		1$				
%6 &KHP FRQF %LRFKHP		1$				
7RWDO		1$				

SFR and average section size (per program)

able 6 – Chemistry Department SFR and Average Section Size

	)	6	)	6	)	6	)	6	)	6	)	6	$ Y H
6	) 5											7 %	
$ Y H		6 H	F W		6	L] H							

able 7 – Comparison of SFR and Average Section Size with Other SJSU Departments

) D O O 6 - 6 8

impact their FTEF. For example, a department with no temporary faculty, 4 T/TT faculty and 4 GSAs, all teaching full time, would have % T/TT of 100%, yet the GSAs are unexperienced instructors with just BS degrees. Also note that GSAs need to be trained and supervised, a responsibility taken on by T/TT faculty.

Analysis - Note that the increase in the % T/TT faculty in Fall 2013 is not due to an increase in T/TT faculty but rather is due to a decrease in the number of temporary faculty, some who were replaced by GSAs. Since GSAs are not incorporated into FTEF it appears as if the %T/TT has increased in Fall 13 to 56.0%. , I Z H F R U U H F W W K H G D W D I R U) D O O ( ) F R Y H U H G E \ U S R U D Q & K H P L V W U \ W K H F D O F X O D W H G 7 7 Z R X O G E H

Table 9 – External Funding in Thousands Secured by Chemistry T/TT Faculty per Year

7 R W D O

7 2 7 $ /

A – Chem 1B – American Chemical Society Standardized Exam

Selected faculty teaching Chem 1B, the second semester of General Chemistry, continue to administer the American Chemical Society Brief Full Year General Chemistry, Form 2002, as a way to monitor the course. The national mean on this test is 24.77 out of 50. Please note this is an older test.

B – Average GPA in lower and upper division chemistry course work.

In an effort to monitor for grad inflation or significant fluctuations in grading we continue to track the average GPA for lower and upper division courses in Chemistry. This data is available at iea.sjsu.edu.

C- Report on PLO #1 as provided by Dr. Lionel Cheruzel

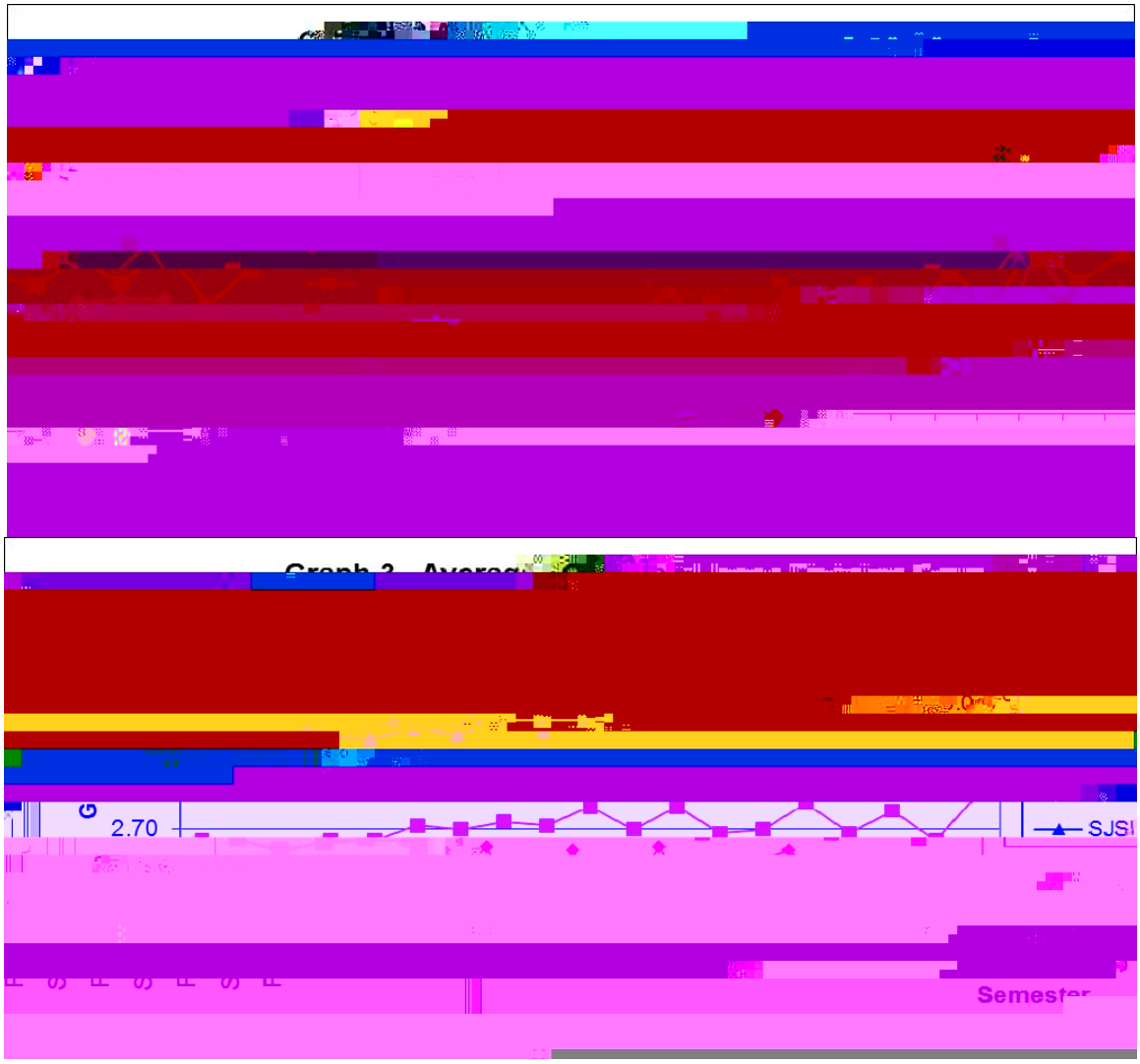
Last time Dr. Cheruzel taught Chem 145, a class only offered in fall semesters, students seemed to have difficulties visualizing the molecular structures in 3D and determining their respective symmetry elements necessary to identify the point group of the desired molecules (CLO-1). This is one of the core

our top students be very competitive for PhD programs. Students from other majors have also benefitted from these opportunities.

Analysis

A – Chem 1B – American Chemical Society Standardized Exam

Selected faculty teaching Chem 1B, the second semester of General Chemistry, continue to administer the American Chemical Society Brief Full Year General Chemistry, Form 2002, as a way to monitor the course. \ th] m ѫ я 4 m ъ v ѯ ъ ѫ i M ¸ MM ή l m5 thb ѫ a ˚ ! я ѫ `



We believe that one reason for the consistency in grading has to do with the fact that the TT/T faculty teach most lectures. This allows for consistency as a function of time with faculty that are not as concerned about their next semester's employment. It also allows faculty to develop and try new ideas. With the decrease in T/TT FTES and increasing FTES we have done our best to still manage to have T/TT teaching lectures by increasing lecture sizes but we are running out of options. Also another factor that we think allows us to retain some consistency in grading is that new tenure track faculty often are mentored by tenured faculty. We now have serious concerns that with the decreasing number of T/TT instructional FTES we might start observing some level of grade inflation if we have to have more part-time faculty teaching lectures or if we lose so many tenured faculty that new TT hires might not be able to be mentored by faculty who taught the course previously. Table 11 shows how Chemistry and CoS compared with others colleges in Fall 2013.

7 D E O H ±) D O O $ Y H U D J H * 3 $ I R U / R L Z Y H L W V L ' E Y Q L & E R X Q V D H

	/' &RXUVHV	8' &RXUVHV
6-68		
$SSOLHG $UWV	6FLHQFHV	
%XVLQHVV		
(GXFDWLRQ		
(QJLQHHULQJ		
+XP $UWV		
6FLHQFH		
6RFLDO 6FLHQFHV		
&KHP		

C – Report on PLO #1 as provided by Dr. Lionel Cheruzel

A question in the final exam worth 16 pts was dedicated to assign point group to several structures. The class average for this question was 10.5. 60% of the students got C or better (10 and higher) on the point group question. Overall, the performance was somewhat adequate, however there is still room for improvement. It would be of essence to understand the student problems in trying to identify point group or visualizing molecules in 3D. For the next time, class assignments of point groups in order to assess student problems with these specific questions should be included in the course.

D – Report on PLO #8 as provided by Dr. Joseph Pesek

One of the issues we have is the development of a rubric to judge student poster presentations. The faculty teaching classes with poster presentations typically evaluate the multiple drafts of the posters, providing students with feedback, so that their final product typically is of good quality. At that point applying a rubric seems to be meaningless because the work already has been evaluated and improved upon multiple times with faculty assistance. It is not clear that this would then demonstrate that a student has learned how to create a poster, although they will have an example in their work to use for future posters. One would assume that they would use that.

We also have come to realize that we have two types of posters to judge in chemistry courses that use posters. Type I is a poster in which a student presents someone else's research. For example in Chem 100W, the student selects a topic and then is required to put together a poster to represent that work. The student is judged on whether they organized the poster correctly, used the correct sections, etc. and then whether the student can answer questions on the work. The actual scientific content of the poster is not judged because it isn't the student's work. We have developed a very rough draft of a possible rubric to use under these conditions. We are currently asking for input and suggestions from the three faculty members who have taught Chem 100W in the last few years. The draft is attached.

We are also consider

r

e φ ɔ M ″ m d ` î l ɪ M

Direct admission into PhD programs in Chemistry, without doing an MS degree, is an accomplishment that requires students to have a strong foundation in chemistry and significant research skills. The Chemistry Department's ability to produce students that secure positions in top PhD programs in Chemistry (Stanford, UC Berkeley Univ. of Illinois, Univ. of Washington, etc.) serves as an external assessment of our students and thus our program. These students are being judged by admission committees at top universities which are composed of top chemistry faculty. Table 12 documents students continuing to top programs since 2008. The table also includes important national level graduate school awards secured by our students.

Table 12 – Chemistry Majors in PhD Programs

Rubric for Type I Poster – Draft

	Poster Lay Out	Text	Figures/Photographs	Graphs (if included)	Overall Presentation /Handling of Questions
Excellent	All components are present and well laid out. Easy to follow in the absence of the presenter Content placed in correct section.	Concise, legible Free of spelling/grammar errors Background assists in legibility	Figures/tables are appropriate ways of summarizing information Well and clearly labeled/numbered Easy to follow, visually compelling	Graph(s) helps in summarizing data; improves on understanding Titled and well labeled axis Data points clearly visible, error bars included or lack of them explained Graph covers plot area well Graph type choice and fit are appropriate for the data (best fit vs connecta dot vs bar graph)	Demonstrates strong knowledge of content Speaks clearly, naturally, with enthusiasm; makes eye contact Uses visual aids to enhance presentation Clear and logical Consistently answers questions clearly and logically
Good	All components are present but lay out is untidy or crowded Somewhat confusing to follow without presenter Content placed in correct section.	Concise, mostly legible One or two spelling/grammar errors Background assists in legibility	Most of the figures/tables are appropriate ways of summarizing information One or two errors in labeling/numbering Visuals are acceptable but could be improved upon.	Graphs helps in summarizing data; improves on understanding One error in title and axis Data points visible, missing error bars or explanation Graph covers plot area in an acceptable manner	Demonstrates good knowledge of the content Speaks clearly and makes eye contact Uses visual aids to enhance presentation Presentation for the most part, was 7.5(n)13.8(a)].8(n)]TJ /TT4 1 Tf 1.3