

Physics Department 2014 Annual Assessment Update  
September 15, 2014  
Chair: Kenneth Kihlstrom

I. Program Learning Outcomes Assessments: While data was collected this year (e.g. MFT exam, papers from senior seminar, etc.), none of it was assessed this year. As noted in section IV below, most of the assessment of the collected data will take place in the next two years.

II. Follow-ups: The main focus in 2012-2013 was preparing for and doing the external review done by Drs. Kenneth Krane and Alma Zook which resulted in a positive review along with a number of suggestions for changes and improvements. This year the biggest overall focus was to respond to those suggestions (closing the loop). In the appendix are the suggestions made in the report (as quoted in last years update). The following are the actions taken:

- A. Revised all three (physics, engineering/physics, 3:2 dual degree program) programs (including the BA and BS versions). All were approved by the Academic Senate. [critical thinking/knowledge]
- B. Building the internship program: This involved coordinating with Jennifer Taylor in Westmont's internship office to improve connections with the local engineering and science community. More contacts were made and one company (Impact Radius) came to campus to recruit students. [critical thinking/knowledge]
- C. Preparing our students for careers after Westmont: We coordinated with the Office of Life Planning to have a Pathways evening for our students which included three alumni of our program to help them get a vision for what they can do now to be ready. We also produced a year by year plan which we put on our website for the students. The latter is also in the appendix. [Skills]
- D. Development of a computational physics course: Dr. Michael Sommermann used his most recent sabbatical to develop a computational physics course that more appropriately addresses the needs for our students and the course was offered for the first time spring 2014. It was successful and replaces CS 10 in the requirements for our majors. [critical thinking/knowledge, skills]
- E. We purchased a number of Matlab licenses for use in the general physics labs to upgrade our students' familiarity with modern data analysis. [skills]
- F. Alumni involvement: Besides the involvement of alums in the Pathways evening (mentioned above in C) we have sought out alums to be more involved in the development of current students. This has involved internship opportunities as well as conversations and advice. [skills]

G. Alumni questionnaire: In our last six year report we did an alumni survey (using Survey Monkey) for the last 10 years worth of alums. This summer we did an e-mail (through the alumni office) to the grads of the last 30 years with a different set of questions and seeking interest to serve our students including advice and job opportunities. This was in response to the external review encouraging us to get alums more involved. The responses are still coming in and this year's report will not include an analysis but we will include an example of the questionnaire and response in the appendix. [critical thinking/knowledge, skills]

III. Other Assessment Projects: In the Multi-year plan (included in the appendix) 2013-2014 was meant to be a preparation year for the external review (scheduled for 2014-2015). But, of course the external review was done last year. The two projects taken on were the development of the oral presentation rubric and the new alumni survey.

A. Oral Presentation Rubric: As part of the assessment of the communication PLO we needed to develop a rubric for oral communication. The rubric is below:

### **Oral Presentation Rubric (General Talk)**

	<b>underdeveloped 1</b>	<b>acceptable 2</b>	<b>exemplary 3</b>
<b>Organization of presentation</b>	No natural progression from idea to idea. Stream of consciousness speaking	Intro, body and conclusions are apparent but lacks critical focus in building to the conclusions	Attention getting opening leads to a progression of well supported ideas that builds to a conclusion
<b>Clarity of presentation</b>	Main points unclear or difficult to see how evidence relates to central thesis. Explanations leave audience confused.	Explanations may make sense, but topic pitched at too high a level or if at correct level audience has trouble following all the logical connections	A good preview of the ideas to be presented allow the audience to follow the organization of the talk and appreciate the main points which are well supported by clear compelling evidence. Good visual aids
<b>Eye contact</b>	Reading the talk directly with rare instances of engaging the audience with eye contact.	Begins with good eye contact but it fades as the speaker becomes dependent on notes or begins poorly and improves.	From beginning to end the speaker engages the audience with good eye contact. Note are glanced at but not depended on giving the impression the speaker knows the

			material well
<b>Pace (Speed)</b>	Either slow/halting due to lack of confidence or rushed (too much material)	Reasonable pace but perhaps not varied to bring emphasis on key points.	Combines good pacing to keep the audience interested with the ability to slow for difficult points that take more time to assimilate
<b>Speaking volume</b>	Too quiet (difficult to hear) or inappropriately loud	A bit of a monotone delivery which fails to maintain interest	Always audible with ease, the volume varies to increase emphasis and enthusiasm.
<b>Command of Material (content)</b>	Obvious gaps of knowledge or superficial understanding	Good points made but too much uncertainty. Not confident answering questions.	Good depth and breadth of knowledge in the talk itself. Able to answer and expand on questions afterwards.
<b>Overall</b>	Overwhelmed by the task. Knowledge is shallow, presentation lost audience	Either sufficient content undermined by uninspired talk or weak material presented well	Authoritative talk presented so audience respects the speakers knowledge and finds the confidence and enthusiasm contagious.

This will be used in the senior seminar to evaluate the quality of the talks.

- B. The alumni survey was discussed above (II G) but to expand that, the goal of this year's survey (as opposed to the one done for the last six year review) was engaging the alums to support current students (as recommended by the external assessment). It did also ask for advice on courses we should offer (which does fit the assessment goals). But the analysis of this survey (mostly still to be done) will focus much more on creating lists of alums for our students to go to for advice, internship opportunities, and job opportunities after graduation. So in that sense this is more in the closing the loop category than the assessment category.

#### IV. Revised Multi-Year Assessment Plan

In the 2011 Physics Six Year Report, we developed an assessment plan for the next six years. For the four program learning outcomes (breaking the skills outcome into two) we had ten assessment tools. We designed a plan that used these assessment tools over the next six years whereby much of the data would be collected every year but only assessed in certain years. This led to the chart below. In each block is a number (representing which of the 10 assessment tools) and a letter (C for collected and A for assessed). Also was a chart for the different projects to be worked on year by year.

Original Physics Department Assessment Plan 2011-2017

**Physics Department  
MULTI-YEAR PLAN**

Outcomes	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	Means of Assessment, Benchmark	Who is in charge
1. Know/Critical Thinking	1C,6C	1C,6C	1C, 2A,6C	1C,6C	1C,6C A, 7- 9A, 10A	1C,6C		See below
2. Skills: Exp/Theoretical	4C	4CA	4C	4C	4C, 7- 9A,10 A	4C		
3. Skills: Communication	3A, 6C	6C	6C	6C	6C,A, 10A	6C		
4. Christian Orientation	5C	5C	5C	5CA	5C, 10A	5C		
5.								
<b>GE Projects</b>								
6. Insert Department Learning Outcomes in all Syllabi	X							
7. Evaluate the 10 SLO measures overall for continuation/removal	X							
8. Revise all rubrics		X						
9. Develop Oral Pres Rubric		X						
10. Plan for External Review			X					
11. External Review of Physics Program				X				
12. Revise Alumni Survey					X			
13. Prepare six year report						X		

**Comments/Reflections:** The following are our measures of our SLO's. In the above chart the measure used is a number of the measure (1 for MFT, 2 for upper level grades, etc. followed by C for collected or A for analyzed). The data was collected every year but not analyzed until later. When only an A appears, the assumption is the data was collected every year but not analyzed until later. Also the current plan involved all ten measures but note that a GE project is to evaluate the ten measures could (and probably will) be made at that time. Also note K=Kenneth Kihlstrom, S=Michael Sommermann

<u>Measure:</u>	<u>Outcome Measured:</u>	<u>Measurement:</u>	<u>Who is respo</u>
1. Major Field Test for physics	Knowledge	Direct	Kihlstrom
2. Upper level Physics grades	Knowledge	Direct	Kihlstrom
3. Evaluation of Lab Abstracts	Skills (esp. comm./writing)	Direct/Authentic	Whittemore
4. Listing of student papers/ Presentations & internship evals.	Skills (esp. Exp. Tech but also writing/oral)	Direct	Rogers
5. Senior seminar Faith/Learning Essay	Christian Orientation	Direct	Sommermar
6. Senior Seminar Physics paper and oral Presentation	Knowledge/Skills (written and oral comm.)	Direct	Rogers
7. Percentage of students in internships	Knowledge/Skills (esp. Exp Tech.)	Direct	Kihlstrom
8. Percentage of graduates: grad. school	Knowledge/Skills (esp. Exp Tech.)	Direct	Rogers
9. Percentage of graduates: technical fields	Knowledge/Skills (esp. Exp Tech.)	Direct	Sommerman
10. Alumni Survey	All	Indirect	Kihlstrom

Since the six year report we have made changes to the order things were done. The biggest change was moving the external review up from the 2014-2015 year to the 2012-2013 year. There are a number of items that are collected each year. For the most part this has been done (with some exceptions). But looking year by year at the assessed and project items:

2011-12: The focus that year was on the action items (closing the loop) from the six year report. Assessing of the lab abstracts was not done (and won't be until late in the six year cycle). The first two projects were completed (insert PLOs in syllabae and evaluate continuation of the 10 assessment tools). Measure #2 (upper level grades) was dropped.

2012-13: The focus was on the external review carried April 2013. This created a number of action items. A minor project was updating the faith/learning prompt.

2013-2014: This last year focused mostly on the action items from the departmental review (as noted in section II). Originally planned for 2012-3, the oral presentation rubric was developed this year.

With all this noted, the revision of the multi-year plan is below. Instead of listing the collection of data for items collected each year, we focus on when the assessments will be done. The assessment methods (nine now with the upper level grades removed) are listed below as well.

### Revised Physics Department Assessment Plan 2011-2017

#### Physics Department MULTI-YEAR PLAN

Outcomes	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	Means of Assessment, Benchmark	Who is charge
1. Know/Critical Thinking				2A	5-9 A			See below
2. Skills: Exp/Theoretical					6-9A			
3. Skills: Communication				2A,5A	5A, 9A			
4. Christian Orientation				5A	9A			
5.								
<b>GE Projects</b>								
6. Insert Department Learning Outcomes in all Syllabi	X							
7. Evaluate the 10 SLO measures overall for continuation/removal	X							
8. Revise all rubrics				X				
9. Develop Oral Pres Rubric			X					
10. Plan for External Review		X						
11. External Review of Physics Program		X						
12. Revise Alumni Survey			X			X		
13. Prepare six year report						X		

**Comments/Reflections:** The following are our measures of our SLO's. In the above chart the measure used number of the measure (1 for MFT, 2 eval of lab abstracts, etc. followed by C for collected or A for analyze collected every year but not analyzed until later. When only an A appears, the assumption is the data either years. Also the current plan involved all ten measures but note that a GE project is to evaluate the ten measures could (and probably will) be made at that time. Also note K=Kenneth Kihlstrom, S=Michael Sommermann

<u>Measure:</u>	<u>Outcome Measured:</u>	<u>Measurement:</u>	<u>Who is responsible:</u>
1. Major Field Test for physics (annual)	Knowledge	Direct	Kihlstrom
2. Evaluation of Lab Abstracts (once)	Skills (esp. comm./writing)	Direct/Authentic	Whittemore
3. Listing of student papers/ Presentations & internship evals. (annual)	Skills (esp. Exp. Tech but also writing/oral)	Direct	Rogers

4. Senior seminar Faith/Learning Essay (annual)	Christian Orientation	Direct	Sommerman
5. Senior Seminar Physics paper and oral Presentation (annual/once)	Knowledge/Skills (written and oral comm.)	Direct	Rogers
6. Percentage of students in internships (annual)	Knowledge/Skills (esp. Exp Tech.)	Direct	Kihlstrom
7. Percentage of graduates: grad. school (once)	Knowledge/Skills (esp. Exp Tech.)	Direct	Rogers
8. Percentage of graduates: technical fields (once)	Knowledge/Skills (esp. Exp Tech.)	Direct	Sommerman
9. Alumni Survey (two types)	All	Indirect	Kihlstrom