1. Assessment information collected

The graduate SLOA process in the Department of Physics has been revised significantly in this review period to incorporate new assessment tools and their analysis. The new metrics/tools developed in this review period are

1. Annual progress assessment form
2. Attachment to annual report
3. Thesis evaluation form
4. Teaching/communication evaluation form
5. Exit survey form
6. Alumni survey form

**Annual progress assessment.** This assessment is completed at every student’s annual committee meeting and any other event (e.g. defenses and oral comprehensive exams). The assessment categories range from general knowledge of the field to knowledge of the publication process.

**Attachment to annual report.** Information about student publications, presentations, awards, applications, proposals, and teaching activities is collected electronically.

**Thesis evaluation.** Thesis evaluation is completed by all advisory committee members and the department chair. It is anonymous and not used to grade individual students. Evaluation categories cover all the major aspects of original scholarly activities from literature survey to quality of writing. No theses have been submitted since the form has been introduced and it is expected that all theses in Physics from this point will be evaluated against the criteria developed.

**Teaching/communications evaluation.** Most incoming graduate students undergo ~1 week of training followed by 2 semester-long teaching seminar classes of 1 credit each. The purpose of the training and seminar classes is: 1) Improve teaching skills (partially to turn students into good TAs but also good teachers), 2) introduce students to active learning techniques, 3) Improve ability to communicate to all audiences (from
The students are all evaluated based on the attached evaluation rubric during that first week, in the middle of the first semester, in the middle of the second semester and at the end of the second semester. In addition direct input from the students on what works and does not work is taken at the end of each semester.

**Exit survey.** In the past, surveys of graduates were conducted in person by the Department Chair, which was complemented by paper surveys sent out to students. This assessment tool has been redesigned for an easier delivery and processing and refocused to capture all exiting students.

**Alumni survey.** A new alumni survey has been developed based on the American Institute of Physics template. The survey is anonymous and questions range from alumni’s assessment of advisors to their preparedness for various professional activities.

### 2. Conclusions drawn from the information summarized above

**Annual progress assessment.** Following each committee meeting (annual meeting, defense, oral comprehensive exam) we evaluate the progress of the student. The assessment is anonymous and not used to grade individual students. This metric has only recently been implemented with no MS students evaluated in this review period. All students must be properly informed about assessment categories and be prepared to demonstrate progress in all of them relative to their year level.

**Attachment to annual report.** There have been no MS student responses. From this point on, all students are expected to complete this report before the 15th of May deadline.

**Teaching/communications evaluation.** Because the instrument to be used was only finalized and agreed on this semester, the conclusions will be more qualitative and anecdotal than quantitative this year, but will be better quantified in subsequent years. There was a large improvement in the students’ teaching performance between the first presentations last August (2015) to the final presentations the first week of May (2016). The confidence and therefore presentation of the material was clearly better, as was the interactivity (which led to more active learning attempts). However: 1) the Socratic dialog method of teaching was not successfully implemented by any of the students despite numerous attempts, 2) the students (and instructors) felt that better preparation for the first labs would be useful 3) more early emphasis on outreach and general public presentations would be valuable.

**Exit survey.** This assessment tool was only recently introduced in electronic format. No data from this interview are available for this report. However, the department chair has interviewed two graduating students who expressed general satisfaction with the program. In particular, they both commented positively on the content and breadth of
offered courses, and the general atmosphere in the department. It was pointed out that the Physics Webpage could be improved and that one student perceived the need for a class that focuses on handling and repairing scientific equipment.

**Alumni survey.** We have adopted a new alumni survey to assess the long-term outcomes of graduates along with their impressions of our graduate program. In our survey, ~40% of the responses came from MS graduates with an even split between research conducted primarily using computational, theoretical, and computational research. The average full-time equivalent years to graduation for MS students was 3.3 years and 66% of the respondents concurred that “if they had to do it all over again”, they would still get a degree from the UAF physics department.

The alumni survey evaluated the graduate experience in terms of the effectiveness of the advisor and the relevance and effectiveness of coursework. We summarize the results as follows (where 1=strongly disagree and 5 = strongly agree):

- My advisor encouraged me in my academic goals: 5.0
- My advisor encouraged me in my career goals: 4.33
- My advisor encouraged me to excel in research: 4.67
- My advisor was accessible: 4.67
- My advisor was easy to discuss ideas with: 4.0
- My coursework was challenging and engaging: 4.67
- The breadth of my coursework was adequate: 4.33
- My coursework prepared me for research: 3.67
- My coursework was vital for my professional and/or post-graduate activities: 2.0

With regard to advisor, the survey results were very positive (i.e., >4.0/5), while the coursework evaluation for MS graduates was mixed.

Our surveyed graduates are all employed. The number of months spent actively seeking employment was 10.5. Employment sectors include educational institutions (2/3) and private/industry (1/3). The surveyed MS alumni agree that their graduate degree was appropriate for their current employment (4.3/5).

The department will continue to refine our alumni survey and make every effort possible to address deficiencies. While the survey results were largely positive, the department might strive to mitigate the average 10.5-month seeking employment time and address some imbalance between advisor’s and coursework contributions. It is important for the advisors to stress the importance of the coursework at MS level even when it may appear to be less important than the advisor’s contribution.
3. **Curricular changes resulting from conclusions drawn above**

The Department has only recently implemented new set of metrics to evaluate our graduate curriculum (see Sections 1 and 2 above). In the first iteration of our metrics, we have not identified many specific issues that require curricular changes at this point.

To address the issues raised by in relation to development of teaching/communication skills, 3 changes will be implemented in addition to the consistent evaluations. 1) A practice first lab will be added to the training week. 2) Socratic Dialogue teaching will be introduced in the first week and discussed more in the first semester but there will be no pressure for the students to implement it as it was found to be difficult for beginning graduate students. 3) In the first semester there will be more emphasis on outreach presentations shifting a bit more of the active learning material to the second semester.

4. **Identify the faculty members involved in reaching the conclusions drawn above and agreeing upon the curricular changes resulting**

The Physics Graduate Student Learning Outcomes Assessment Committee:

Roman Makarevich (Chair)

Peter Delamere

David Newman

Martin Truffer

The summary form has been discussed and agreed to by the entire Physics faculty.