PRAC continued discussion on the following conversation, begun on April 21, 2016:

Biology is in its second review cycle. The program has an assessment coordinator and plan in place. The previously proposed assessment was put on hold in order to revise the curriculum.

The program adequately describes its mission, its goals, and its faculty and student demographic. Twelve full-time faculty service the needs of approximately 400 majors (for a ratio of 1:33). Thirteen part-time faculty help meet the teaching needs of the program.

The FT faculty are active in their research agendas, include students in conducting research and, in some cases, in publications and presentations. Students have published abstracts independently from faculty. The students also spearhead four clubs on campus: the Biology club, Biotechnology club, Botany club and the Global Brigades.

There are currently four undergraduate degrees offered for majors in the Biology department, one of which was recently approved, but is awaiting implementation (BS in Biotechnology). The BS in Biology has the largest number of majors out of the four, and it serves the student population that will pursue graduate or pre-professional training (e.g. medical school). The BS with Certification is for students who will teach Biology in Middle or High Schools. Finally, the BA in Biology is less specialized than the BS, and serves those who wish to study the discipline in the wider context of a liberal arts education. All of these degrees have at their core 3 specific courses (BIO 102, BIO 103, BIO 220) and a selection of classes from Anatomy and Physiology; Biodiversity and Ecology; and Cell and Molecular Biology; for a total of 10 courses (38-40 credits). The degrees differ in their required cognates (PHY, MAT and CHE courses). All of these degrees share the same five outcomes as delineated on pages 3, 6, 8-9 of the report (Content
Mastery; Mathematical Literacy; Technological Fluency; Use of the Scientific Method; and Scientific Communication). The department will also offer a 4+1 Masters program.

While the minor was not addressed in the self-study report, it was made clear during the meeting on April 21 that the Biology major shares the same three core courses as the major degrees, and is/will be assessed in the same manner.

The revised curriculum (above) was introduced in fall 2014, and some preliminary assessment data has been gathered for one of the five outcomes: Mathematical Literacy. A clear plan has been mapped out for the assessment of the remaining outcomes:

- **Content Mastery**: an entrance and exit exam on key concepts covered by the program; and
- **Mathematical Literacy, Technological Fluency, Use of Scientific Method, Scientific Communication**: faculty evaluation of each element from student-identified “best” lab reports from their tenure at SCSU; a rubric will measure proficiency in these four areas

The Biology department has also used student surveys as an indirect measure to assess their program. “Considering we have just begun implementing our new degree programs, we have already seen improvement in terms of students’ ability to meet department goals (Figure 2.3)” (Self-study, p. 13) Students’ responses from 2012 and 2015 indicate an increased expectation to analyze a topic in depth and to reason from evidence.

Students in BIO 396 (Synthetic Biology) are also participating in pre- and post-tests; and, since fall 2015, students taking BIO 296 and 386 (Genomics I and II) participate in an external pedagogical survey (SEA-PHAGES: Science Education Alliances: Phage Hunters Advancing Genomics and Evolutionary Sciences vs. Traditional Lab). About ninety other colleges and universities also participate in this survey.

Based on the assessment data gathered thus far, the Biology department has decided to implement a minimum grade requirement in introductory
level Biology I and II courses to prevent poor student performance in upper levels.

Several challenges remain for the program, which can be divided into two main categories:

1) Advising the large numbers of majors; retention; and timely graduation rate
2) Resource allocation and needs

While both of these groups of challenges are necessarily intertwined, PRAC would like to underline the program’s need for resources. There has been a reduction of faculty due to attrition, and there is a lack of adequate space for classes and research. We urge the administration to support Biology in terms of the necessary human resources (faculty line(s)) to accommodate and serve the large number of students in a responsible way; and to provide the space and equipment necessary to help SCSU remain student- and research-centered.

**PRAC recommends continuing approval** of the Biology program with the proviso:

> While the committee likes what the department has planned for assessment, it is still in the emerging state and PRAC urges the Biology Department to continue the work it has begun. At the next departmental review the expectation is that the assessment process be fully in place and several years of data will be available to inform the department about its needs going forward.

> For the future self-study, information about the following must be included: the Biology minor and its assessment; a short description of the Master’s degree program(s) to orient the reader; and a clearer differentiation between the undergraduate programs. These three items were sufficiently addressed in the meeting between Drs. Jeffrey and Silady and PRAC, but will need to be recorded in future reports.

for: 8 against: 0 abstain: 1