Instructional Program Review
Narrative Report

1. **College:** Laney College
   Department: Mathematics
   Date: November 10, 2012
   Members of the Instructional Program Review:
   Fred Bourgoin (chair)
   Dr. Inger Stark (dean)
   Loretta Scheu
   David Ross

2. **Narrative Description of the Department**
   The Laney College Mathematics Department not only teaches students specific knowledge that they will need in their chosen careers but also teaches them critical thinking, reasoning, and working as part of a team—skills that they will need to be competitive in the job market. The Department continues to maintain its tradition of embracing new technologies and pedagogical methodologies. The program offers an AS-T in Mathematics.

3. **Curriculum**

   a. **Is the curriculum current and effective? Have course outlines been updated within the last three years?**
   Approximately half of our course outlines were updated in the last 3 years. All others will be reviewed and updated as necessary by the end of spring 2013.

   b. **Please indicate how many active courses are in the department inventory.**
   28
   The following courses have been deactivated since Attachment C was produced: Math 52A, 52B, 52C, 251A–D, 290, 291, 295A–D, 205A, 205B.

   c. **How many of those have been updated in the last 6 years?**
   15

   d. **If courses have not been updated within the last 6 years, what plans are in place to remedy this?**
   1 is being updated this semester; several will be updated in December 2012; the remaider will be updated in spring 2013, ahead of the Curriculum Committee's recommended timeline.

   e. **Has your department conducted a curriculum review of course outlines? If not, what are the plans to remedy this?**
   15 course outlines have been reviewed; several more will be reviewed by the end of this

semester; the remaider will be reviewed in spring 2013, ahead of the Curriculum Committee's recommended timeline.

f. **What are the department's plans for curriculum improvement (i.e., courses to be developed, updated, enhanced, or deactivated)? Have prerequisites, co-requisites, and advisories been validated? Is the date of validation on the course outline?**
3 new courses were developed and approved by the Curriculum Committee this semester. All course outlines will have been updated by the end of spring 2013. A Distance Education Addendum will be added to 1 course outline this semester, with 1–2 to follow in spring 2013. 8 courses were deactivated this semester. All prerequisites, co-requisites, and recommended preparation remain appropriate. Validation dates are not listed in the course outlines; that will be remedied when we review all course outlines in spring 2013.

g. **What steps has the department taken to incorporate student learning outcomes (SLOs) in the curriculum? Are outcomes set for each course? If not, which courses do not have outcomes?**
All active courses have SLOs, including newly developed courses.

h. **If applicable, describe the efforts to develop outcomes at the program level. In which ways do these outcomes align with the institutional outcomes?**
The Mathematics Department has 3 PLOs. They target our students' ability to analyze and interpret data presented to them in various forms, and to solve problems using different approaches. This mirrors ILO #2 (Critical Thinking and Problem Solving) exactly. Our PLOs are also aligned with ILO #1 (Communication) in the sense that our students are expected to present their results in a clear manner, be it orally, in written form, or with the help of visual displays.

i. **Provide one program level outcome (PLOs), and the assessment tool that will be used to measure the program level outcome this fall 2012 and spring 2013.**
PLO #2 (Graphs): Interpret and/or create geometric representations of relations. This PLO was assessed in spring 2012, as were the other 2. A common exam question was given to all students in Math 3F (Differential Equations) and graded according to our rubric. There are no plans to assess PLOs this academic year, as all 3 were measured in spring 2012.

j. **How are the SLOs and PLOs, if applicable, mapped to the college's Institutional Learning Outcomes?**
None of our SLOs or PLOs are mapped to the college's ILOs because ILOs are not yet in TaskStream.

k. **Recommendations and priorities.**
At this time, the Mathematics Department has no pressing needs other than the continued support of the Curriculum Committee and the Learning Assessment Committee.

4. Instruction

a. Describe effective and innovative strategies used by faculty to involve students in the learning process. How has new technology been used by the department to improve student learning?

The Mathematics Department continues to embrace new technologies pertinent to student learning as evidenced in the following sample of our recent efforts.

- *Statistics Instruction.* Retired full-time faculty William Lepowsky created many interactive MS Excel spreadsheets designed to improve students' understanding of difficult concepts through first-hand experience. These tools are used in the classroom, thanks to a smart classroom, and are also available to students on the class website. They are increasingly being used by other instructors. Part-time faculty Ramesh Narasimhan has developed many tools (games, instantaneous polling via texting, etc.) specifically designed for our Athletes section.
- *Self-Paced Classes.* Full-time faculty Katherine Williamson has integrated tools such as email, online homework with instantaneous feedback (MathXL), Moodle, and online videos in our redesigned Math 210 to improve and encourage active student participation.
- *Online Homework.* An increasing number of our Algebra and Calculus classes make use of online homework submission systems such as MathXL and WebAssign. This greatly reduces the financial burden of textbooks on students and provides them with a more interactive experience (instantaneously checking their answers, getting help through online examples and videos, etc.). Our Linear Algebra and Differential Equations students are also often required to use MATLAB and DFIELD, software readily available to them in the Math Lab or online.

b. How does the department maintain the integrity and consistency of academic standards within the discipline?

The Department collects all syllabi at the beginning of each semester to ensure that the requirements made of students are the same in all sections of each course. Exam exchanges among instructors are common (but not systematic).

c. Discuss the enrollment trends of your department. What is the student demand for specific courses? How do you know? Identify factors that are affecting enrollments.

The Mathematics Department maintains its own historical enrolment records.

- *Overall Enrolment.* Census enrolment has decreased to below 3000 since spring 2011, corresponding to a decrease in the number of sections we offer (60 in spring 2012 vs. 77 in spring 2010), but we remain the largest Mathematics Department in the District by far.
- *Algebra (Math 201 and 203).* Math 201 enrolment has remained stable over the last few years, around 1000. There was a sharp in increase in Math 203 enrolment after fall 2009, when the course became the statewide requirement for obtaining an AA/AS: 671 in 2008–09 to 957 in 2010–11.
- *Statistics (Math 13).* Enrolment doubled between 1997–98 (509) and 2007–08 (1018), and it remains very high (975 in 2010–11).

- *Other Courses.* Enrolment is more-or-less stable in all other courses, with a small decrease in the last year or two.

We have recently discovered that there was a demand for Business/Social Sciences Calculus (through systematic polling of Calculus students). In response, full-time faculty Derrick Smith created 3 new courses (Math 16A, 16B, and the prerequisite Math 1), which were approved by the Curriculum Committee this semester. Changes in transfer requirements have boosted Math 13 enrolment. Changes to AA/AS graduation requirements affected enrolment in Math 203. Our reduced number of sections in the last year or two accounts for the decrease in enrolment numbers. The vast majority of our classes are full at Census Day each semester.
(Data provided by Dr. Inger Stark and from departmental history sheets maintained by William Lepowsky.)

d. Are courses scheduled in a manner that meets student needs and demand? Please describe the criteria and considerations used in the scheduling process.

High-demand courses have many sections, allowing us to schedule them at various times of the day and on various days to accommodate our students' work/school schedules. Night and Saturday sections are for example essential to accommodate students with full-time jobs. For courses with fewer sections, we rely on our historical enrolment records. The higher-level classes are scheduled in consultation with the Physics and Engineering Departments since we have many of the same students. With our new courses (Math 1, 16A, 16B), for which we have no historical data, we polled current Calculus students.

e. Recommendations and priorities.

Although we keep track of our own data as much as we can, we need to have access to the BI Tool to measure our progress in many areas (e.g., retention and success rates) and to build schedules more effectively.

5. Student Success

a. Describe student retention and program completion (degrees, certificates, persistence rates) trends in the department. What initiatives can the department take to improve retention and completion rates?

The number of degrees conferred dropped 50% last year, but we expect that number to return to pre-2011 historical levels (or higher) with the introduction of our new AS-T degree (approved this semester), which we now actively encourage our students to apply for. Retention rates have steadily increased (to 69% in fall 2011), as instructors emphasize study skills more. Success rates remain low (55–60%); this is mainly due to our self-paced classes, which we are currently redeveloping. Retention and success rates seem to be directly affected by the availability of quality tutoring in our Math Lab. Despite tutoring budget cuts, a decrease in hours of operation, and the fact that we have only had a temporary Instructional Assistant for the last 5 months, the Math Lab remains vibrant is student satisfaction is high.
(Data provided by Dr. Inger Stark.)

b. Identify common challenges to learning among your students? What services are needed for these students to improve their learning? Describe the department's efforts to access these services. What are your department's instructional support needs?

The three main challenges faced by our students are as follows.

- Our lower success rates are in the pre-collegiate classes, where students' study skills are poor and tutoring is needed most. Self-paced classes have not been very successful; we are therefore redesigning them to include (among other things) more instructor oversight and greatly increased interaction with students.
- The DSPS office's ability to help our disabled students has unfortunately decreased significantly. In the majority of cases, we provide distraction-free locations (instructor offices near the Math Lab when available) and proctor longer exams ourselves; we are ill-equipped and untrained to attend to other special needs. The DSPS office has been very receptive to our needs, but it lacks the appropriate staffing.
- The tutor-training program developed by ESL co-chair Lisa Cook was an invaluable tool to insure that our tutoring services are top-notch. That program has unfortunately lost its funding, and temporary Instructional Assistant Nick Shaposhnikov has done his best to fill the void. The much needed permanent position was recently approved by Chancellor Ortiz, and the hiring process has begun.

c. Describe the department's effort to assess student learning at the course level. Describe the efforts to assess student learning at the program level. In which ways has the department used student learning assessment results for improvement?

The Mathematics Department is lucky to count Learning Assessment Committee member Katherine Williamson among its faculty. With her help and guidance, we have created a department-wide assessment schedule (for both SLOs and PLOs), and we are successfully following our self-imposed timeline. Instructor participation in SLO-related activities is very high. Informal discussions of assessment results are frequent, and we plan to have more formal get-togethers at the end of the semester.

d. Recommendations and priorities.

The Mathematics Department strongly recommends that:

- The Curriculum Committee and the Learning Assessment Committee continue to support faculty and departments as they have successfully done so far;
- The Tutor-Training Program be reinstated and funded, including the necessary release time for coordinating faculty; this is the only way that the quality of tutoring offered on campus—in the Math Lab in particular—can be monitored and kept consistent;
- The DSPS office be funded appropriately to attend to our students needs.

Our efforts to improve student success depend primarily on:

- Appropriate and consistent funding for the Math Lab;
- Continued support from the college to redesign our self-paced classes (in the form of release time or Math lab instructor assignments);
- Consistent IT support for the computers used by our students.

6. **Human and Physical Resources (including equipment and facilities)**

   a. **Describe your current level of staff, including full-time and part-time faculty, classified staff, and other categories of employment.**
   The Mathematics Department currently has 9 full-time faculty, 27 part-time faculty, and 1 (temporary) Instructional Assistant.

   b. **Describe your current use of facilities and equipment.**
   G 201 is used for the Math Lab (tutoring, lending out books, proctoring exams for our self-paced classes). Faculty and the Instructional Assistant use G 202 to conduct day-to-day business. G 203 is used for office hours and as a classroom. The aforementioned 3 rooms, and G 204, G 208, G 212 are used as offices for part-time faculty and to hold office hours. G 204 and G 208 are also used to provide quiet environments for DSPS students and instructors requiring special accommodations under ADA law. G 201 has 16 computers for student use. (Many instructors have adopted online homework submission systems to counteract the outrageous prices of textbooks.) G 202 has 4 computers and 1 printer, mostly for use by instructors and the Instructional Assistant. G 203 is a classroom with 30 computers and 1 printer. G 205 is a classroom with 34 computers and 1 printer. An increasing number of instructors use the technology in G 209 and G 246 (smart classrooms).

   c. **Are the human and physical resources, including equipment and location, adequate for all the courses offered by your department (or program)? What are your key staffing and facilities needs for the next three years? Why?**
   Human Resources:
   - *Faculty.* We are in dire need of 2 new full-time faculty to replace recent retirements. (Contract FTEF fell from 9.6 in fall 2010 to 6.64 in fall 2011.) With more demands being placed on full-time faculty in recent years, we are left with more work and fewer people to do it. This limits our ability to develop new courses, participate in shared-governance committees, and offer consistent instruction. The department is currently at the lowest percentage of contract FTEF it has ever been: 34 % contract/total FTEF as of fall 2011. We also expect one more full-time faculty to retire in May 2014.
   - *Instructional Assistant.* Once the permanent position (recently approved by Chancellor Ortiz) is filled, the Math Lab will be adequately staffed.
   - *Other Staff.* We do not have the staff needed to run G 203 as an open lab per President Webb's wishes.
   - *IT Support Personnel.* While we do not need a dedicated support person, one should be readily available when needed. We have witnessed significant improvements in the last year, but support remains insufficient.

   Physical Resources:
   - *Classrooms* would be adequate if class caps were consistent with fire-code room caps. Many of our chair/desk units need to be replaced as the height adjusters are broken and chairs "sink." The location of most of our classrooms (in the G and F buildings) is perfectly adequate.
   - *Furniture.* G 208 has none. It needs 1–2 desks, chairs, and storage units.

- *Computers for Instruction.* All computers in G 201, G 202, G 203, and G 205 need to be replaced. Heavy use has taken its toll on them, and both hardware and software are outdated. Extra peripherals (such as keyboard and mice) should also be on hand to replace broken ones expediently. Also, one of our laser printers is on its last leg.
- *Computers for Instructors.* All faculty desktops/laptops need to be replaced. Older hardware and software are no longer adequate or relevant.

(Data provided by Dr. Inger Stark.)

d. If your department experienced a reduction in resources, describe the impact of that reduction on the overall educational quality of your unit and the College.

The Mathematics Department has been impacted in 4 areas.

- *Math Lab Hours.* The hours of operation of the Math Lab have gone from 50 to 36 hours per week in recent years. Every day students line up outside G 201 long before 10AM, and many are surprised and disappointed to find the Math Lab closed on Fridays. Being able to sit down and do homework at a computer and having access to tutors while doing it is essential to student success, especially for pre-collegiate classes. Mathematics is learned in large part through practice; denying students access to a dedicated environment conducive to learning is putting their learning in jeopardy.
- *Faculty Lab Assignments.* Until two years ago, one faculty member was present in the Math Lab at all times (50 hours/week); we are now down to 16 hours/week. Despite the quality of our tutors, they are not always able to answer students' more advanced questions. When that happens, the faculty can step in. Students also often come to the Math Lab seeking guidance regarding the courses they should enroll in, asking questions about the Credit by Examination that we offer, looking for instructors, etc. These are tasked best performed by faculty.
- *Tutoring Budget.* Our budget for tutors was significantly reduced, causing students to have to wait longer for help and become frustrated. Because tutoring is only sporadically available at the other colleges, we have also seen an increase in the number of students who come to Laney specifically for its Math Lab.
- *Supplies Budget.* Our temporary Instructional Assistant has done an excellent job in maintaining operations in the Math Lab smooth. Our largest need is for a supplies budget that is adequate to purchase dry-erase markers in sufficient quantities. With our current budget, we can only supply instructors with enough markers to last a month or two. This is especially burdensome on part-time instructors.

e. How does the department plan to sustain the quality of instruction and/or services offered through your department in the current environment of reduced resources?

The faculty, staff, and tutors in the Mathematics Department (with the help of our dedicated dean and her assistant) are working harder than ever before to maintain the high quality of our instruction and services. With less funding for tutoring, we have begun using volunteer tutors, but this makes maintaining consistency and quality more challenging. We have consciously let more students add our classes (within reason) while maintaining the quality of our students' experience. Despite being stretched very thin, we

continue to participate in college-wide activities and shared governance as much as possible.

f. What does the department recommend that the college do to maintain quality educational programs and services?

The Mathematics Department makes the following recommendations:

- A minimum of two new full-time faculty must be hired in order to maintain—and only *maintain*—the high-quality instruction the Department has historically provided. The two faculty who retired in 2011 (Calvin Rouse and William Lepowsky) were very productive members of the Department, and their departure has left a gaping hole in our resources.
- Provide adequate and consistent funding for tutoring in the Math Lab.
- Revive the Tutor-Training Program to help us maintain the quality of tutoring students (rightly) expect.
- Attend to our need for updated technology (in the Math Lab and for instructors).

g. Please provide any other recommendations and priorities.

See Attachement D1.

7. Community Outreach and Articulation

a–d. N/A **(For Career and Technical Education Programs)**

e. Describe the department's efforts in meeting with and collaborating with local 4-year institutions. How is the program preparing students for upper division course work?

With the help of Articulation Officer Laura Bollentino, some of our faculty have been in correspondence with UC Berkeley faculty regarding prerequisites for existing and new courses. In our higher-level classes (especially Calculus III, Linear Algebra, and Differential Equations), we emphasize the importance of concepts and proofs and expose our students to material they will see in their upper-division education. All of our transfer students are strongly encouraged to work in teams and develop robust study habits now in order to ease their transition to four-year colleges.

f. Has there been a Transfer Model Curriculum identified for your program? Has it been implemented? If not, what are the plans to do so?

A Transfer Model Curriculum was developed and implemented this semester. It was approved by the Curriculum Committee and the state.

g. Describe the department's efforts to ensure that the curriculum responds to the needs of the constituencies that it serves.

The Mathematics Department is always aware of the requirements imposed on transfer students by CSUs and UCs; changes in their curriculum heavily influences our own curriculum updates. By remaining in contact with key faculty at CSUs and UCs, we ensure that our knowledge is current. Since the majority of our students are working towards Math 15 (Mathematics for Liberal Arts) or Math 13 (Statistics) in order to

transfer, we have been paying special attention to our algebra courses, which typically are stumbling blocks. Math 208 (Mathematics for the Laboratory Sciences) was developed with the Biology Department a few years ago in response to the demand for the creation of the Bioengineering Certificate. The Department is currently working with CTE Departments to create a course tailored to their students' needs.

h. Please indicate how many of the full and part time faculty have been evaluated in the last three years. For faculty that have not been evaluated in the last three years, what are your plans to become current.

33% of our full-time faculty (3 out of 9) were evaluated in the last 3 years; all will have been evaluated by fall 2014, in accordance with the schedule we have established.
78% of our part-time faculty (21 out of 27) were evaluated in the last 3 years; all will have been evaluated by fall 2014, in accordance with the schedule we have established.

i. Recommendations and priorities.

The Mathematics Department has no recommendations at this time.