Tier 3 Program Narrative for Graduate Programs

The following document is the tier 3 program narrative for Graduate programs. This document reflects the opinions of the Director of Graduate Education.

Teaching, Learning, Scholarship

For the academic programs you expect to offer and the students you expect to serve:

1. What effective approaches to teaching and learning are emerging in your field and related to interdisciplinary areas?

   Graduate Programs provide an effective path for developing and deploying interdisciplinary fields of study. For example, Business Analytics which covers topics in statistics, computer science, business and engineering. Team teaching is often utilized in these programs which shares the work load across several departments and colleges.

2. How should Learn by Doing incorporate new learning needs, opportunities and technologies?

   Many graduate programs require more advanced laboratory equipment to support their learning objectives. The universities needs to participate in NSF funded centers and develop virtual lab experiences where appropriate. In addition, partnerships with UC campuses that would enable our students to participate in advanced courses by utilizing distance learning technologies would be effective.

   Campus wide VDI (virtual desktop) infrastructure for supporting complex computational software thru a central server system would allow students to have low cost access remotely thru tablet devices (e.g. IPad or Kindle) and would eliminate the need for expensive computer labs.

   Centralized advanced research labs would enable multiple programs to share common equipment that could support programs across CAFES, CSM and CENG. Also manufacturing facilities that provide additive manufacturing could serve the entire campus.

3. How does the teacher-scholar model fit?

   Graduate programs can be a key enabler of faculty scholarship. It is the graduate student that often provides the research work necessary for a faculty member to get a grant or complete industry sponsored research. Graduate students have the foundation
knowledge provided by their bachelor’s education and can put into practice the skills they have learned.

Graduate students can also serve as TAs and provide more cost effective teaching than either faculty or lecturers. Due to their proximity in age and experience with the materials being taught TAs are often more effective at communicating with undergraduates and can relate to their current education level of understanding. TAs are an underutilized resource at Cal Poly.

Learning Environments

What learning environments should Cal Poly develop or modify to accommodate (1) new modes of teaching and learning, (2) Learn by Doing, and (3) the teacher-scholar model in the future? Please respond in terms of the qualitative characteristics of the facilities and other spaces (including technology) critical to your programs and students:

1. **Formal, scheduled or organized instruction**

   Formal scheduled instruction will likely continue to be the primary mode of education for graduate programs. The face-to-face classroom or laboratory format will continue to be our primary environment for learning. In order to facilitate a sense of a learning community for graduate students more study area space should be provided for graduate students. Rather than at a central area like the Library, graduate students need to be close to their labs and interact with others who are engaged in the same discipline of learning. Structuring project/study areas in close proximity to research labs would be ideal.

2. **Informal student learning outside the classroom or laboratory**

   Graduate programs would benefit from a professional lecture series which requires a lecture hall type room that is not scheduled for classes. It is virtually impossible to get conference or lecture hall space that can handle 100+ students during normal campus hours (9AM – 5PM).

3. **The teacher-scholar model.**

   There is very little dedicated research space and technical support services for maintaining these areas.
Considerations

Academic Mix (including state-support/self-support funding)

– Program mix/college shares (program headcount; FTES including GE and support)
The self-support model lends itself well to certificate programs of 4-5 courses but is not a good vehicle for master's degree programs. The CSU needs to allow for mixing of students from state and self-support programs in order to efficiently utilize our limited faculty resources.

– Undergraduate/post-baccalaureate/graduate mix (by college)
Today, graduate students make up about 4% of our enrolled student body. This could easily be increased to 10% without a significant impact to the campus. Enrollment numbers should be optimized to fill graduate level courses to 25-30 students. It is not more expensive to educate graduate students and the differential in tuition would cover the slightly smaller class sizes. Inadequate enrollment and the mixing of undergraduate and graduates in 5XX level courses make it hard to separate instructional costs between undergrads and graduate students. Graduate programs with exam based culminating events and that have cohort structured curriculum can be very cost effective for Cal Poly. The College of Business runs several programs utilizing this structure which are actually revenue generators.

– CA resident/domestic non-resident/international student mix (by college, by level)
Graduate programs have a wide appeal to students both within CA and outside of CA. Most Ph.D. granting universities do not focus on master level programs and so this is an opportunity for Cal Poly to offer superior value added programs. Especially since master’s programs are mostly course based and benefit from teaching oriented faculty. In fact, many doctoral granting universities are now looking more favorably at recruiting master’s level students so they can focus on their research activities and not teaching.

Cal Poly does not currently have the community infrastructure to support international students.

Teaching and Learning (by program and student level)

– Learn by Doing; Teacher-Scholar
As previously stated, a work load model that supports T-S must be established. Currently only non-tenured junior faculty are motivated by RPT to do much scholarship. These faculty are at risk of burn-out by the time they reach tenure and are unable to sustain a health balance between professional development-teaching-family.

– Pedagogy/learning modes (e.g., delivery, engaged learning, undergraduate research, community service, internships/field placements, study away, study abroad, technology, session structure)
The blended (4+1) program gives graduate students an excellent opportunity to integrate their undergraduate senior project work with a master thesis. The Vertically Integrated Project model being piloted by Purdue and Georgia Tech should be considered by Cal Poly for integration of the capstone senior project experience with a thesis. Co-op experiences could also be
developed that are designed to achieve learning outcomes that contribute to the master’s degree.

A major problem at Cal Poly is that graduate programs are often oriented towards meeting faculty needs NOT student needs. Graduate programs should be structured to equip students with the knowledge and skills needed by industry sectors that are willing to compensate students for the added expense of a master’s degree. We should offer graduate level 5XX courses that are taught at the appropriate level (not co-mixed with undergraduate) and offer a cohesive curriculum that meets well documented program learning objectives (PLOs) that are appropriate for a master’s degree.

Study abroad is not a cost effective experience for master’s programs.

– **Space, infrastructure and information systems implications**
  Dedicated space for research needs to be addressed in the next master plan.

A more robust ITS infrastructure supporting VDI should be implemented by Cal Poly if they want to stay on the leading edge of technical education.

**Co-curricular Learning (in general and by program, level)**

– **Discipline-based activities; student life more generally**
  Dedicated research labs and graduate student study areas are needed.

– **Residential community**
  The idea of expanding the residential capacity of Cal Poly is good. Graduate students should be included in this mix.

**Student Success (in general and by program, level)**

– **Retention, graduation rates; preparation at entry, achievement gaps; student diversity (gender, ethnic origin, financial means)**
  Retention rates in graduate programs are not currently assessed by Cal Poly and should be. Graduate students need degree applicable unit tracking thru PolyProfile. Their formal study plans should be on-line and tracked for progress towards degree. A large number of graduate students do not complete their culminating event and a study needs to be done to determine contributing factors and how to correct this problem. Continuous enrollment should be mandatory and enforced through the office of the Registrar. Financial support is often contributing factors that lead students to not complete their graduate degree and take a job.