

**Undergraduate Program Review of
The Department of Structural Engineering**

Dr. James Levin, Review Committee Chair
Education Studies, UCSD

Dr. Tom O'Neil
Physics, UCSD

Professor H. Thomas Hahn
Mechanical & Aerospace Engineering, UCLA

April 16, 2008

A. Description of the current operation of the Department

The review committee met with the Department's chair and two vice chairs, with 10 other faculty members, with 8 teaching assistants and lecturers, with 7 undergraduate students, and with the Department's MSO and undergraduate advisor staff person. We also met with two College Deans of Academic Advising and with the Director of the Jacobs School's Engineering Student Services. We examined the Department's self-statement as well as extensive documentation of their undergraduate teaching. We looked at their Departmental web site and newsletters. There was no previous CEP review of the undergraduate program of the Department, since it is relatively young. There was an ABET (Accreditation Board for Engineering and Technology) review in the Fall of 2007, but the results of that review were not available for us to examine.

Established in 1997, the Department of Structural Engineering has 483 undergraduate majors, with 473 in their ABET-approved Structural Engineering major and 10 in their Engineering Science major (as of April 14, 2008). The Department has chosen to focus on the structural systems that cut across many engineering disciplines, especially those in conventional civil engineering and aerospace engineering departments. This interdisciplinary focus is embodied in a strongly collaborative problem-based approach to learning that values a balanced theoretical and practical understanding over more conventional acquisition of abstract engineering knowledge. With its focus on structural engineering, the Department is unique among universities in the United States, but is serving as a model for change by other more conventional civil engineering departments.

The undergraduate major offers four specializations through upper division focus sequences: civil structures, aerospace structures, renewal of structures, and earthquake engineering. While the Department has undergone rapid growth in the number of undergraduate majors over the past decade, it may have reached a stable state in numbers, and so may be entering a stage of maturation with more steady state operation.

Students in both majors are required to complete 148 units of coursework, including 12 lower division courses in Math, Chemistry, and Physics, 16 core courses in Structural Engineering and MAE. Students in the ABET-accredited Structural Engineering major complete a focus sequence (4 courses), in addition to 3 technical electives courses. Majors in the non-ABET accredited to Engineering Sciences are required to complete 7 technical electives.

The Department's 19 tenure-track faculty members currently teach most of its courses, supplemented by a few lecturers and adjunct faculty. The Department has a full-time undergraduate affairs staff member who advises its undergraduate students, including

both those who start at UCSD as freshmen and those who transfer to UCSD. The staff advisor meets regularly with the faculty member in charge of undergraduate affairs and with the other faculty serving on the undergraduate committee. The Department is currently spread over several buildings while waiting for the construction of a new building, currently scheduled for completion in 2010 but with ground-breaking yet to occur.

B. Analysis of the strengths and weaknesses of the Department's undergraduate program

Strengths:

We were impressed by the Department's vision of structures as a unifying concept cross-cutting conventional disciplinary boundaries. This vision provided the Department with a focus that served it well, particularly in the area of undergraduate education. We found that this vision was enthusiastically shared by both the faculty members and the students that we talked with, and was a thread underlying the documents that we examined. This vision is innovative yet coherent; unique among departments in universities in the US yet serving as a model for similar engineering programs at other universities.

We found that the curriculum and courses were generally well organized and that undergraduate instruction was carried out in innovative yet effective ways by the Department. We liked the focus on hands-on experience with collaborative project-oriented activities, and found that both students and faculty embraced this pedagogy.

Advising, both for students who started as freshmen and those who transferred, seemed to be very effective and well coordinated across the multiple sources of advice.

The Department has been relatively successful in attracting a diverse range of undergraduate students. There are 34.4% female Structural Engineering undergraduates (compared to 20% in the School of Engineering). Only 28.6% of the undergraduate majors are white, with 35.4% Asian, 18.6% Mexican-American, and 5% Filipino. Only 1.2% are African-American and only 0.4% are Native-American, so those remain as challenges for the Department's recruitment process.

Weaknesses:

While the Department has adopted an interactive model of learning, the resources committed to that model seemed to be stretched thin. The TA/reader resources allocated to courses seemed a bit sparse, and we couldn't decide whether that was due to the recent rapid growth, with resources provided lagging behind demands or whether there were other more systemic reasons. We provide below some suggestions for dealing with this resource limitation.

The project-oriented instructional activities were running into other limitations as well. The undergraduate instruction strains available classrooms, laboratory space, and technology infrastructure in several ways as well. For example, the students commented on difficulties accessing the Departmental computer lab that hosts the expensive commercial software needed for many of the undergraduate courses. Some of these limitations may be lifted when the Department's new building is completed. We provide below some suggestions for dealing with these limitations as well.

While the Department expressed a concern for lack of diversity among its faculty, there has been little progress on this concern across recent hires. The Department has only one female tenure-track faculty member, and the ethnic distribution of faculty consists of eleven white faculty members; one Pakistani / East Indian member; four Chinese / Chinese American members; one other Asian member; one Spanish member; and one Latin American / Latino member. On both the gender and ethnic measures of diversity, the Department lags the School of Engineering and the rest of campus in the diversity of its faculty.

C. Analysis of the strengths and weaknesses of the Department in the context of campus and University policies

Strengths:

We were impressed that the Department is starting to use the new communication media heavily used by undergraduates as part of their instructional and advising processes. For example, the Department has established a Structural Engineering presence on Facebook, a social networking environment used by many undergraduates but few faculty. We think that this can serve as a model for other Departments both in the School of Engineering and those across campus as well.

The advising of the Department is well coordinated with both the advising provided by the Jacobs School of Engineering and by the six Colleges at UCSD. This is a model for advising that could serve other Departments on campus well.

Weaknesses:

The Department faculty members expressed frustration with the process of bringing distinguished designers from industry into the Department to strengthen their design-based problem-solving approach. Typically such experts do not have the conventional publication record to support their appointment in tenure-track professor positions.

While the Department has been able to bring in some experts from industry as adjunct faculty or lecturers, there seemed to be a need for providing longer-term commitment, especially for those developing new courses for the Department.

Students expressed concerns with class and final scheduling of Departmental courses, and with a shortage of TA and reader allocations.

D. Recommendations for alleviating any problems suggested by the description and analysis

Recommendations:

Both faculty and students commented on the need for additional Teaching Assistant and Reader resources for Departmental courses. We suggest several ways to ameliorate this need:

- 1) Change departmental policy to require graduate students to serve as teaching assistants three times during their graduate career or even one quarter each year (these are policies that exist in other departments at UCSD). Such requirements can be justified on educational grounds in that the TA service helps graduate students improve their teaching and communication skills.
- 2) Use more of the Department's highly qualified undergraduates as readers, especially for the lower division courses
- 3) Examine the systemic allocation of resources for TAs and readers, to see if additional resources can be obtained by shifting resources from other uses

Both faculty and students commented on the need for additional instructional laboratory facilities. The new building, when completed, will help, but even when that is completed, there will likely be need for additional resources to equip the new labs. We recommend that the Department explore outside resources, including the National Science Foundation and private foundations and individuals. The new building provides a rationale for approaching both foundations and individuals, and any outside funding obtained for instructional laboratory equipment could help out even before the building is ready for use.

Students commented on the limitations of the Departmental computer labs that had expensive commercial software required by courses. Students increasingly have their own laptops (6 of the 7 students we talked with indicated they had their own laptops), so the need for computer labs needs to be reconsidered. We recommend that the Department, perhaps in conjunction with other Engineering Departments or other entities on campus (CalIT2, SDSC, etc.) approach the software companies that sell the required software (MatLab; SAP; etc.) to seek licenses for inexpensive student versions or server-administered class licenses of software required for course work.

There was concern by some faculty and lecturers about the mathematics preparation of undergraduate majors. One recommendation is that the Department consider

collaborating with other Engineering departments to develop one or more mathematics courses using the modern computational tools used by engineers.

We recommend that the Department expand their use of new communication media to support collaborative learning. Perhaps the Department can connect up their undergraduates with distributed design groups that are using collaborative software to engage their students in "teleapprenticeships" or "teletask forces" or other innovative forms of interaction.

Academic Affairs is drafting a proposal for a new "Professors in Practice" faculty line that may well address the problems that Structural Engineering has been having in hiring design experts to teach that aspect of their curriculum.

Finally, we find a tension between the focus by the Department on preparing interdisciplinary engineers who know how to work collaboratively and to learn what they need to know when they need to know it, and the focus on covering an ever-increasing body of engineering knowledge. We recommend that the Department carefully consider its vision and the implications it has for undergraduate education, so that they can continue their successful efforts to create innovative yet effective learning environments for the Structural Engineering undergraduates.



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TO: Committee on Educational Policy
DATE: February 16, 2009

Dear CEP:

On behalf of the Chair Gil Hegemier and the other Vice Chair Benson Shing, please find attached the Department of Structural Engineering response to the external review of our department in 2008. We appreciated the review and the opportunity to respond to it, and we look forward to discussing it, if appropriate, with the review committee and your office. If anything further is required, please do not hesitate to contact either me or Chair Hegemier

Best Regards,

A handwritten signature in black ink that reads "Michael D. Todd".

Michael D. Todd, Ph.D.
Associate Professor of Structural Engineering
Vice Chair, Department of Structural Engineering

Cc: Gil Hegemier, Benson Shing



**Response to the 2008 Department of Structural Engineering
Undergraduate Program Review**

Submitted by

Gil Hegemier, Chair
Michael Todd, Vice Chair and Chair of Undergraduate Affairs (submitter)
Benson Shing, Vice Chair
Lelli Van Den Einde
Tara Hutchinson
Petr Krysl
Ahmed Elgamal
Yuri Basilevs

February 12, 2009

1. Background, Introduction, and Contents

On January 7, 2008, the Department of Structural Engineering submitted to Associate Vice Chancellor Barbara Sawrey a self-study report as part of a periodic review of the department's undergraduate program. On April 14-15, 2008, the review committee comprised of Dr. James Levin (Educational Studies, UCSD), Dr. Tom O'Neill (Physics, UCSD), and Dr. Thomas Hahn (Mechanical and Aerospace Engineering, UCLA) visited the department and interviewed faculty, staff, and students. On April 16, 2008, the review committee issued a report on its findings. This document is the department's response to the review document, addressing any concerns and recommendations offered in the report. The department greatly appreciates the time and attention given by the review committee in its assessment of the department.

2. Comment on Strengths

We acknowledge the committee's recognition of our "vision of structures as a unifying concept cross-cutting conventional disciplinary boundaries" (Sec. A, pg. 2) and that this vision was "innovative yet coherent; unique among departments in universities in the US yet serving as a model for similar engineering programs at other universities" (Sec. A, pg. 2). We are certainly proud of this vision that separates this department from traditional civil and mechanical engineering departments.

We also appreciate that the committee found that "the curriculum and courses were generally well organized and that undergraduate instruction was carried out in innovative yet effective ways by the Department. We liked the focus on hands-on experience with collaborative project-oriented activities, and found that both students and faculty embraced this pedagogy (Sec. A, pg. 2). We believe our curriculum naturally supports the vision above and demands innovative pedagogical methods to execute it successfully, and clearly the committee agreed we are doing that.

We also thank the committee for recognizing our incorporation of modern media methods such as Facebook (paraphrased, Sec. C, pg. 3). We have found this already to be an important outlet for maintaining alumni contact.

Finally, we are very proud of our undergraduate advising program led by Sharon Harvey and of the participation by the individual faculty, and we are pleased that the committee recognized that (Sec. A, pg. 2). We are particularly proud that the committee stated "The advising of the Department is well coordinated with both the advising provided by the Jacobs School of Engineering and by the six Colleges at UCSD. This is a model for advising that could serve other Departments on campus well." (Sec. C, pg. 3).

We thank the committee for its observations in these areas, and we shall continue to excel in making the department maintain its unique position in the US.

3. Response to Weaknesses

In this section we shall address explicitly the weaknesses/concerns noted in the committee's report.

[1] Resource allocations. The committee found that "While the Department has adopted an interactive model of learning, the resources committed to that model seemed to be stretched thin. The TA/reader resources allocated to courses seemed a bit sparse..." (Sec. B, pg. 2)

The department is given a block grant of funds to be used for TA/Reader hires to support undergraduate instruction by the primary faculty. As a first step in the allocation process, the total funds in this block grant are divided among the sum total of the expected enrollments in each of the undergraduate courses that will be offered in a given academic year. These expected enrollments are accurately based on historical precedent for the courses. Then, given what the TA and Reader salaries per course are, an average funding amount may be calculated to support a student, and subsequently TA/Reader allocations are made based on actual class enrollments (typically, 40-50 students equates to one 25% time TA and one 25% time Reader). Then, the department modifies the average allocation to support more heavily classes with significant laboratory components (such as SE 140, the senior design course).

Without an increase in block grant funding (allocated by formulas at the Campus level), the Department feels this procedure is the most quantitative and fair method for allocating the funding. In difficult budget times, such as we are facing now, the Campus is attempting to preserve block grant levels, but under increased enrollment, the "average allocation" may need to be modified in an undesirable way. Nonetheless, the department is taking the recommendation of the committee to hire more qualified undergraduate readers (at a lower cost) for the 2008-2009 academic year, and this is indeed helping the situation.

[2] Strains on space, infrastructure, and technology. The committee found "The undergraduate instruction strains available classrooms, laboratory space, and technology infrastructure in several ways as well. For example, the students commented on difficulties accessing the Departmental computer lab that hosts the expensive commercial software needed for many of the undergraduate courses" (Sec. B, pg. 3).

Since the review, access to the required structural engineering software has been extended through the Academic Computing Services (ACS) to two additional computer labs (one in EBU-II and one in S&E). The report recommended looking into obtaining student licenses for the expensive software to enable students to install on their laptops. This is not as optimal for the software used in our department, as it is more convenient for ACS to manage software licenses at a central location. Furthermore, ACS already gets the software at educational prices based on host licenses, which is ultimately a cost-effective solution for the students (although it may not be as convenient for them). While the department can look into this model or even the option of allowing students to remotely access the computer servers where the software resides, as a department we feel that to promote

collaborative learning, it is important for the department to provide software in the computer labs rather than directly to the laptops (to encourage students to work on campus). To address resources for laboratory space, the department is providing multiple sections of larger laboratory courses such as SE 140. In doing so, we are accommodating twice the number of students in the same space by maximizing the available schedule.

[3] Faculty diversity. The committee noted that “While the Department expressed a concern for lack of diversity among its faculty, there has been little progress on this concern across recent hires” (Sec. B, pg. 3).

Since the review, an additional female faculty member was hired as a Lecturer with Potential Security of Employment (LPSOE). The LPSOE is dedicated to undergraduate teaching and can therefore address resource issues and scheduling issues by enabling multiple sections of a course to be offered in one year. In fact, the LPSOE (Prof. Lelli Van Den Einde) is a co-chair of the ABET (engineering accreditation) committee, and leading efforts in other undergraduate affairs such as external educational funding efforts, outreach, and enrichment. Furthermore, we are currently interviewing two female candidates for the tenure track position in Geotechnical Engineering. We have strong support from the Jacobs School of Engineering in retaining women and are actively pursuing this. We continue to employ UC guidelines on best practices for a diversified faculty recruiting strategy.

[4] Industry-based instructional support with design portion of curriculum. The committee found that “The Department faculty members expressed frustration with the process of bringing distinguished designers from industry into the Department to strengthen their design-based problem-solving approach.” (Sec. C, pg. 3)

Although not necessarily a weakness but rather an observation of frustration among some faculty, the department continues to seek strong industry designers to serve in the adjunct professor position and as lecturers for relevant design courses. One may consider, for example, the current model of the long-standing adjunct Professor Robert Englekirk, who not only teaches courses or guest lectures for the department but is actively involved in ongoing experimental research in the department, thus bridging the gap between academia and industry. Another example is Dr. Jorge Mensus, a former post-doctoral researcher in the department, who is currently working in industry locally in San Diego and teaches a graduate course in earthquake engineering. The SE 290 graduate seminar series consistently brings in former students and industry colleagues to provide seminars. Furthermore, the structure of the capstone class (SE 140) is currently being refocused to include industry participation, with input from the department’s External Advisory Board. As a first step, designers from industry are being invited to lecture to the senior students. We hope to restructure the course to foster project-based mentorship programs where senior project teams are paired with local companies and independently design and analyze interesting structural problems with industry mentorship. Finally, the department is investigating the Professors in Practice series identified in the report, which may allow a better title under which to make hires for undergraduate design instruction.

[5] Student concern with scheduling and resource allocation. The committee stated that “Students expressed concerns with class and final scheduling of Departmental courses, and with a shortage of TA and reader allocations” (Sec. C, pg. 3).

Often when bottlenecks in enrollment for specific classes present themselves, the department provides multiple offerings of various classes within an academic year to accommodate the growing number of transfer and other students who, if forced to wait to take a course, will need to extend their time at UCSD to take pre-requisites. An example of this is SE 2, which was offered Fall, Spring, and Summer in 2007-2008. Once enrollment returned to normal, we only offered the course once. Course offerings are adjusted based on enrollment projections as the need arises. Furthermore, the department continues to cross-list courses with Mechanical and Aerospace Engineering (MAE) to enable students to take core curriculum during multiple quarters being offered once through our department and once through MAE (SE 101 A,B,C and SE 110A). We also created a specialized fluid mechanics course (SE 115), also cross-listed with an MAE course. We continue to offer SE 130A and SE 130B during summer sessions to accommodate transfer students. In the past have offered SE 1 and SE 2 (and can resume this if required through enrollment projections).

4. Response to Recommendations

[1] TA service requirement. The committee recommended that the department “Change departmental policy to require graduate students to serve as teaching assistants three times during their graduate career or even one quarter each year” (Sec. C, pg.

This is a recommendation that will require department consensus as well as decisions regarding where the resources to fund TAs/Readers come from (the block grant). Such a recommendation would require that either the department augment the block grant from other funds or asking faculty to fund this through research grants, which in most cases poses ethical issues with regard to grant expenditures. In lieu of this recommendation, as stated earlier, the department is currently addressing this resource issue by hiring undergraduate tutors and modifying standard TA allocations to the most needed courses (such SE 140).

[2] More undergraduate readers. The committee recommended to “Use more of the Department's highly qualified undergraduates as readers, especially for the lower division courses” (Sec. D, pg. 3).

This has been implemented for the current academic year, as mentioned previously.

[3] Examine resource allocation. The committee recommended that the department “Examine the systemic allocation of resources for TAs and readers, to see if additional resources can be obtained by shifting resources from other uses” (Sec. D, pg. 3)

The resource allocation model was discussed previously, and the department is working within budget constraints to allocate efficiently and in a targeted way.

[4] External resource support. The committee recommended that “...that the Department explore outside resources, including the National Science Foundation and private foundations and individuals. The new building provides a rationale for approaching both foundations and individuals, and any outside funding obtained for instructional laboratory equipment could help out even before the building is ready for use” (Sec. D, pg. 3)

The department is very interested in expanding its resources through additional external sources such as NSF. The newly hired LPSOE has an interest in education research to introduce technology and hands on activities in the classroom and is already seeking funding to promote such educational activities. Additionally, several faculty have already obtained small grants through the Instructional Improvement Program at UCSD. For example, Professors José Restrepo and Chia Ming Uang received funding to support testing of reinforced concrete specimens for design courses such as SE 103, SE 150, SE 151 A&B, and SE 152. Professor Petr Krysl received funding for the development of audio/visual tutorials for SE 131, and Professors Vistasp Karbhari and Chia Ming Uang received funding to improve equipment required for the structural materials and design courses, respectively. In addition, recently the Department requested \$19.5K from JSOE to essentially double the infrastructure required to support reducing project team sizes in our capstone class SE 140. Finally, the department is partnering with ATA Engineering Inc. to pursue joint funding solutions with equipment donations from ATA Engineering Inc. supporting NSF educational grants. We will continue to pursue these avenues for diversified funding.

[5] Computer lab assessment. The committee recommended that “the Department, perhaps in conjunction with other Engineering Departments or other entities on campus (CalIT2, SDSC, etc.) approach the software companies that sell the required software (MatLab; SAP; etc.) to seek licenses for inexpensive student versions or server-administered class licenses of software required for course work” (Sec. D, pg. 4).

This was addressed in Section 3 above.

[6] Mathematics training. The committee recommended that “...the Department consider collaborating with other Engineering departments to develop one or more mathematics courses using the modern computational tools used by engineers” (Sec. D, pg. 4-5).

The long-range plan for the department put forth in 2006 by the Undergraduate Affairs Committee is to introduce an advanced math course fashioned after the existing MAE 105 (Introduction to Mathematical Physics) but specifically tailored to problems in structural engineering. To prepare for this course, we are collecting information about the current state of mathematical preparation of our students, with plans to submit this to the JSOE to demonstrate the need for such a course. Ideally, we will either work with the MAE department to ensure that MAE 105 meets our need for improved mathematics training. If

so, this course can be offered in multiple quarters cross-listed through MAE and SE, which could alleviate some resource issues as well

[7] Increase in collaborative learning. The committee recommended that “...the Department expand their use of new communication media to support collaborative learning” (Sec. D, pg. 5).

The department will strongly consider this recommendation, particularly with the use of modern media methods like Twitter, messaging services, and WebCT. Structural engineering faculty almost unanimously employ WebCT in undergraduate instruction, and this has the capability for doing real-time, group learning, collaborative exercises.

[8] Vision consideration. The committee recommended that “...the Department carefully consider its vision and the implications it has for undergraduate education, so that they can continue their successful efforts to create innovative yet effective learning environments for the Structural Engineering undergraduates” (Sec. D, pg. 5).

The committee expressed enthusiasm for the department’s vision as noted above, but we anticipate that this recommendation is suggesting that the department consistently maintain awareness of the possible difficulty in balancing its interdisciplinary, collaborative vision with the ever-increasing body of required engineering knowledge for the structural engineering specialist. We strongly appreciate and agree with this recommendation, and we are constantly adapting our curriculum—examples of which are provided above—to maintain a healthy balance.

5. Summary Statement

The department again appreciates the evaluation and review of the department’s undergraduate program. This document acknowledges the committee’s observation of strengths and considers the concerns and recommendations that the committee enumerated. We hope the document adequately addresses these points where possible and that we have shown where we have taken tangible actions to improve our program. We reiterate that the department is committed to the highest quality of undergraduate education possible, even given the severe recent budgetary constraints that will likely affect the program in the short term.

FRIEDER SEIBLE, DEAN
WALTER J. ZABLE PROFESSOR OF ENGINEERING
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March 11, 2009

To: Committee on Educational Policies (CEP)
Steven Constable, Chair
MC 0002

From: Frieder Seible, Dean, Jacobs School of Engineering



I fully concur with the Structural Engineering Department's response (dated February 12, 2009), to the 2008 Department of Structural Engineering Undergraduate Program Review. I will work closely with the department to implement the review committee's recommendations.

cc: Gil Hegemier, Chair, Dept of Structural Engineering
Michael Todd, Vice Chair, Dept of Structural Engineering
Benson Shing, Vice Chair, Dept of Structural Engineering

June 4, 2009

PROFESSOR GILBERT HEGEMIER, Chair
Department of Structural Engineering

SUBJECT: CEP Review of the Department of Structural Engineering Undergraduate Program

At its May 1, 2009 meeting, the Committee on Educational Policy (CEP) considered the review report of the Department of Structural Engineering Undergraduate Program, the Department's response and the memo from the Dean of the Jacobs School of Engineering.

CEP was impressed with the Department's decision early on to focus on the structural systems that cut across many engineering disciplines, especially those in conventional civil engineering and aerospace engineering departments, which was unique among U.S. universities but is now serving as a model for change by other more conventional civil engineering departments. The CEP was pleased to learn of the highly collaborative hands-on project-oriented teaching activities and that both students and faculty have embraced this pedagogy. Additionally, the curriculum and courses were found to be generally well organized, advising is effective and well coordinated and there is a good diverse range of students. Most impressive were the positive comments from the College Deans of Advising.

On the other hand, the impact of the Department's highly interactive project-based model of teaching is that the Department seems to be stretched thin. Given the hands-on project-orientated pedagogy, the TA/reader resources allocated to classes seem sparse and obviously puts strains on available classrooms, laboratory space and technology infrastructure. Students expressed concerns with class and final scheduling of Department courses and the shortage of TAs and readers. The Committee was pleased to learn that the Department has responded to the review report by choosing to use more undergraduate readers in classes. Unfortunately, the hope to move to a new building is unlikely to be a reality anytime soon given the current fiscal climate but the Department is trying to deal with scheduling and laboratory space restrictions.

The CEP agreed with the following recommendations of the review committee, which will be the focus of the one year follow-up review in Spring 2010.

1. Change departmental policy to require graduate students to serve as teaching assistants three times during their graduate career or even one quarter each year (these are policies that exist in other departments at UCSD). Such requirements can be justified on educational grounds in that the TA service helps graduate students improve their teaching and communication skills.
2. Use more of the Department's highly qualified undergraduates as readers, especially for the lower division courses.
3. Examine the systemic allocation of resources for TAs and readers, to see if additional resources can be obtained by shifting resources from other uses.



Steve Constable, Chair
Committee on Educational Policy

cc: D. Donoghue B. Sawrey
P. Drake F. Seible
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July 16, 2010

To: CEP
Subject: Follow-up Review of the Department of Structural Engineering's undergraduate program
From: Jim Levin

I met with Gil Hegemier (Chair of Structural Engineering) and Michael Todd (Vice Chair) on July 15th to conduct a follow-up review of the undergraduate program of the Department of Structural Engineering. There were three recommendations that CEP made in June 2009 that we went over, which I'll put into *italics*, followed by the results of our follow-up review meeting.

- 1. Change departmental policy to require graduate students to serve as teaching assistants three times during their graduate career or even one quarter each year (these are policies that exist in other departments at UCSD). Such requirements can be justified on educational grounds in that the TA service helps graduate students improve their teaching and communication skills.*
They've looked into this, and have decided that recommendation 2 (below) is a more effective way to support their undergraduate majors.
- 2. Use more of the Department's highly qualified undergraduates as readers, especially for the lower division courses.*
They found this a positive suggestion, which they've implemented with good results. They now have undergraduate readers, who are guided by a graduate student "head TA", and all are given a one day training before the Fall semester begins. The number of complaints on CAPEs about TA support has dropped since these changes have been made.
- 3. Examine the systemic allocation of resources for TAs and readers, to see if additional resources can be obtained by shifting resources from other uses.*
They, like the rest of campus, have suffered from budget cutbacks. But since 2008, the Department has reached a relatively stable state in terms of numbers of undergraduates (after years of rapid growth), so the problem of lagging support for growing numbers has decreased. The use of undergraduates has helped them deal with resource shortages.

In addition, we heard that their new building is back on track (after a year and a half delay) and may be ready by early 2013, which will help with the bottlenecks found by the review with their laboratory space. They have hired an additional woman faculty member and are actively pursuing other under-represented candidates for their current faculty searches. They hope that the new Distinguished Practitioner line will help with the frustrations they described in the original 2008 review of being unable to bring in exemplary practitioners.

In summary, the original review was very positive, and the Department has responded well to the few minor weaknesses that the 2008 review highlighted.