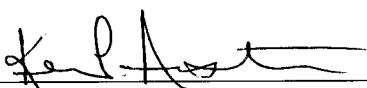



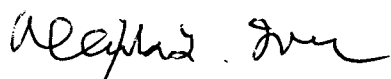
**Report by the 2007 Committee on the  
Caltech Student Experience and Student Affairs**


**October 3, 2007**

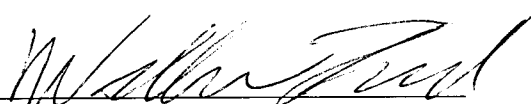
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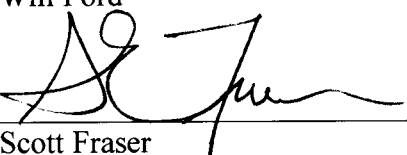
  
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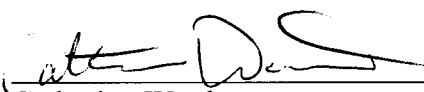
  
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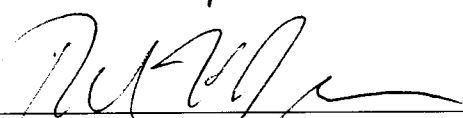
  
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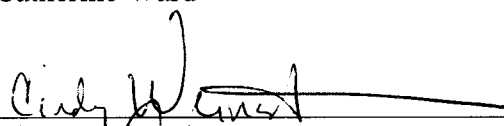
  
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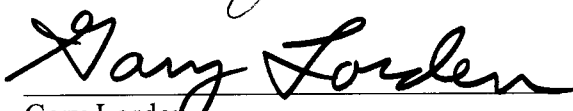
  
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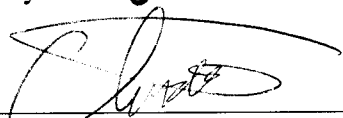
  
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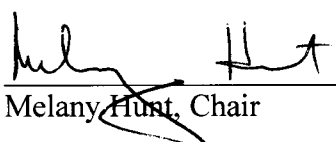
  
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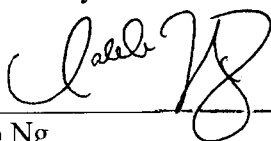
  
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# Report by the 2007 Committee on the Caltech Student Experience and Student Affairs

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Report by the 2007 Committee on the  
Caltech Student Experience and Student Affairs

## **I. Summary of Recommendations**

1. The Institute should reaffirm its educational philosophy and its commitment to excellence in teaching, advising and undergraduate research. The Caltech administration should provide leadership on the importance of educating our future scientists and engineers. The expectation is that all faculty members participate in educating both undergraduate and graduate students and that educational excellence is a part of the Caltech reward system.
2. The Provost is the Chief Academic Officer of the Institute. As such, the Provost's Office should provide mechanisms to ensure the quality of teaching, mentoring and advising for both the undergraduate and graduate programs. In addition, the Provost's Office should provide oversight of the undergraduate program and explore ways to assess the success of Caltech's academic programs.
3. The Core Curriculum should be reviewed for content and breadth. In reviewing the Core, the Committee recommends that the undergraduate program have sufficient flexibility to allow students to participate in academic-year research and to provide opportunities for freshman to interact directly with faculty. The review should also consider the range of backgrounds of incoming students, the scheduling of the Core courses, and the use of grades in the third term of the freshman year.
4. The Committee recommends steps to improve the academic environment and to reduce stress on students by monitoring the number of hours required in courses, by introducing feedback within the term, by providing opportunities to develop better study habits, and by improving the tutoring system through the Dean's Office.
5. The Dean's Office and the Graduate Studies Office should develop processes to monitor and to evaluate the reasons why students leave Caltech without completing their degree goals. These offices should also look at our policies regarding overloads, underloads, extensions and leaves of absence.
6. The Vice President of Student Affairs should be a Caltech faculty member. The positions within Student Affairs involving faculty (such as the Deans) should be attractive so that faculty members can be recruited to these positions. Faculty should be encouraged to interact with Student Affairs so that the support and education of Caltech students is a partnership between the faculty and the professionals within Student Affairs.

7. The Office of Graduate Studies needs to clarify its role and mission at Caltech. The Office should help to ensure proper support for the graduate students, especially in situations involving conflicts between a student and adviser. The Graduate Office should interface with the Graduate Student Council, explore ways to continue recruiting minority graduate students, and coordinate a review of the honor system as it applies to graduate students.
8. Caltech should redefine and reorganize the residential life program for students to facilitate the integration of students' academic and non-academic lives. Caltech should create a position of assistant or associate Dean of Residential Life within the Office of the Dean of Students. The Committee recommends changes to the Resident Associate, Upper Class Counselor and Health Advocate programs, and a reaffirmation of the role of the MOSH. The faculty, administration and students must recognize and respect the careful balance between student self-governance within the Houses and Caltech's responsibility for ensuring a healthy and safe environment for all students.
9. The Institute needs to continue to diversify the student body and faculty. The administration must provide leadership on diversity issues; it should reconsider the mission of the Administrative Committee on Diversity and Minority Affairs (ACODAMA), which reports to the President.
10. To promote interactions with the Caltech Trustees, the Committee endorses the establishment of a Trustee committee that focuses on the Caltech student experience. The proposed Trustee committee should include two student Advisory Members, be involved in the assessment of the academic programs, and provide opportunities to interact with the students in social and academic settings.

## II. Charge and Scope of the Committee

In March 2007, President Jean-Lou Chameau and Acting Vice-President John Hall appointed a committee composed of students, staff and faculty. The charge can be summarized as follows:

**Students.** What are the key aspects of the undergraduate student experience at Caltech, including curricular and extra-curricular activities? What are the key aspects of the graduate student experience at Caltech?

**Student Affairs.** What are the capabilities of the Vice-President of Student Affairs? Should we continue with a VPSA reporting to the President, or should it be a Vice-Provost, reporting to the Provost? Should the position be combined with the Dean of Students? Is Student Affairs successful in its roles of supporting students? Is the current office and management structure of Student Affairs appropriate and effective?

**Faculty.** Does faculty interaction with students need to be increased or made more effective? If so, how?

**Trustees.** What would be the most effective means to leverage the interest of the Trustees?

The original charge and the list of committee members are given in the appendix.

The Committee began addressing the charge by consulting with approximately 30 individuals, including members of the Caltech faculty, Student Affairs professionals, and the Division chairs. The student members of the committee also consulted with their peers. These discussions were valuable in providing a range of views about student life at Caltech and the role of Student Affairs. In addition, we reviewed internal documents, including reports on Core Curriculum reform from 1980, 1986 and 1996; the report by the Task Force on Undergraduate Residential Life Initiatives from 2001; an external report on Student Affairs from 2002; a report from the MOSH Advisory Committee in 2002; a report from the ad hoc committee on a Dean of Undergraduate Studies in 2003; a 2004 report from the Graduate Studies Committee on the Office of Graduate Studies; an external report on the Dean and the Office of Graduate Studies from 2004; recommendations from Student-Faculty Conferences from 2005 and 2007; the 2005-06 Student Affairs Annual Report; and a draft of the Office of Campus Life Annual Report from 2006-07. Although these reports were written by different committees at different times, the Committee found that some reports contained similar recommendations; some of these earlier recommendations are also repeated here.

The Committee had access to the results of the 2006 and 2007 Caltech exit surveys for both B.S. and PhD graduates. The on-line posting of the Teaching Quality Feedback Reports (TQFR) were valuable. The Committee looked at external rankings, including the 2007 and 2008 rankings by U.S. News and World Reports and the 2007 Princeton Review. The appendices contain some of the data from the exit surveys, TQFR and the external rankings.

After the initial conversations and review of these materials, the Committee recognized that we could not focus on all areas of Student Affairs and the Caltech student experience. We noted that there are currently three ongoing subcommittees preparing for

an accreditation visit by the Western Association of Schools and Colleges (WASC). The subcommittees are Education, which is focusing on teaching quality and student workload; Undergraduate Research, including the SURF program, research for pay, and research for academic credit; and the Honor System including the Board of Control (BOC), the Conduct Review Committee (CRC) and the honor code in non-academic settings. Within the next year, these subcommittees will provide detailed recommendations on each of these areas. Because of these ongoing efforts, the Committee chose to minimize the duplication of our efforts. For example, we did not focus on the honor system for undergraduates, although we do make some recommendations regarding the honor system for graduate students. We also did not focus on undergraduate admissions, because there is an ongoing committee (also appointed by J.L. Chameau and J. Hall) that is charged with reviewing the admissions process. We did not investigate budget issues, including the operation of Auxiliaries. The Committee felt that there are individuals on campus who are more knowledgeable about the financial considerations of these operations, and that the Committee was unprepared to make recommendations.

This report describes the key aspects of the Caltech undergraduate experience and associated issues; a separate section describes the graduate experience. The last section contains ten recommendations endorsed by the Committee. Although Caltech is an outstanding research university, the Committee recommends changes to the academic programs and student services. These changes can help to ensure that Caltech's academic and student development programs are as outstanding as its research program.

### **III. Issues Associated with the Undergraduate Student Experience**

The key aspects of the undergraduate experience at Caltech involve intense academics centered on the Core Curriculum, research with a faculty member, the House system, and the Honor Code. With the exception of the Honor Code, this report addresses issues that the Committee found important with regard to undergraduates academics, research and the House system.

Caltech is one of the most selective universities in the country. Each year, Caltech attracts top high-school seniors from around the world who are interested in science and engineering. According to the annual rankings performed by U.S. News and World Reports, Caltech's entering students have the highest average SAT scores of any school in the country (see U.S. News & World Report data from 2007 and 2008 in the appendix). In 2007, ninety-four percent of the entering class was in the top 10% percent of their high school; in 2008, the percentage was 88%. Caltech's admissions process selects these students based on their outstanding high school records and test scores, their demonstrated interest in science, math and engineering, and other supporting information. Because of Caltech's small size and research focus, these students should have an outstanding environment for studying science, math and engineering.

Although the incoming students are highly qualified, not all of these students graduate. In 2007, the four-year graduation rate was 73%. In recent years, Caltech’s 6-year graduation rates has averaged around 89%, considerably higher than our 4-year rate but noticeably lower than our peer institutions of Harvard, Princeton, Yale, Stanford and MIT (see data from the U.S. News & World Reports). These non-graduating students may lose interest in science or engineering and transfer out of Caltech. However, Caltech has not done an analysis of our graduation and retention rates. There may be reasons other than the scientific focus that contribute to our relatively low (as compared to peer institutions) graduation rate.

In the recent exit surveys, Caltech B.S. graduates were asked if they would recommend Caltech to a high school student with a background similar to their own. Fewer than a quarter of the students responded that they would “definitely recommend” Caltech (see Fig. 1); just over half of our students would “definitely” or “probably” recommend Caltech. When students at MIT were asked the same question, 54% of their new graduates responded that they would “definitely recommend” MIT; almost 80% of their

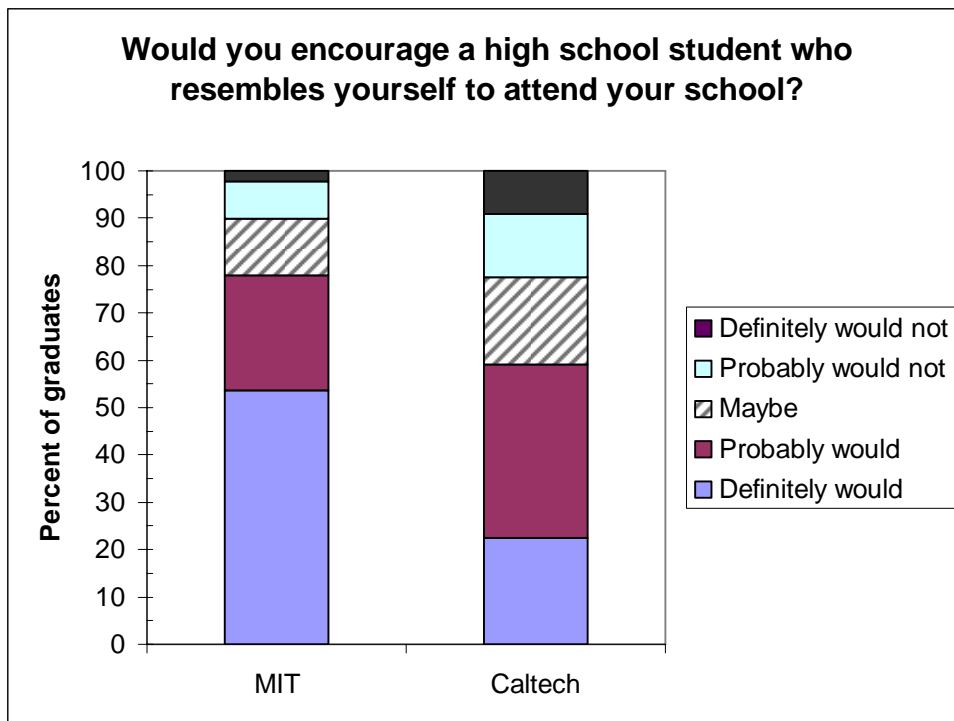


Figure 1. Responses from the 2006 senior exit surveys at Caltech and MIT when asked, “Would you encourage a high school student who resembles yourself to attend your school?” At MIT, 589 students responded out of a total of 1026 students (57% response rate). At Caltech 210 students responded out of a total of 245 students (86% response rate); the same question was not asked in the 2007 Caltech survey. 2006 MIT data from the MIT web page <http://web.mit.edu/ir/surveys/senior.html>; 2007 MIT data is not available.

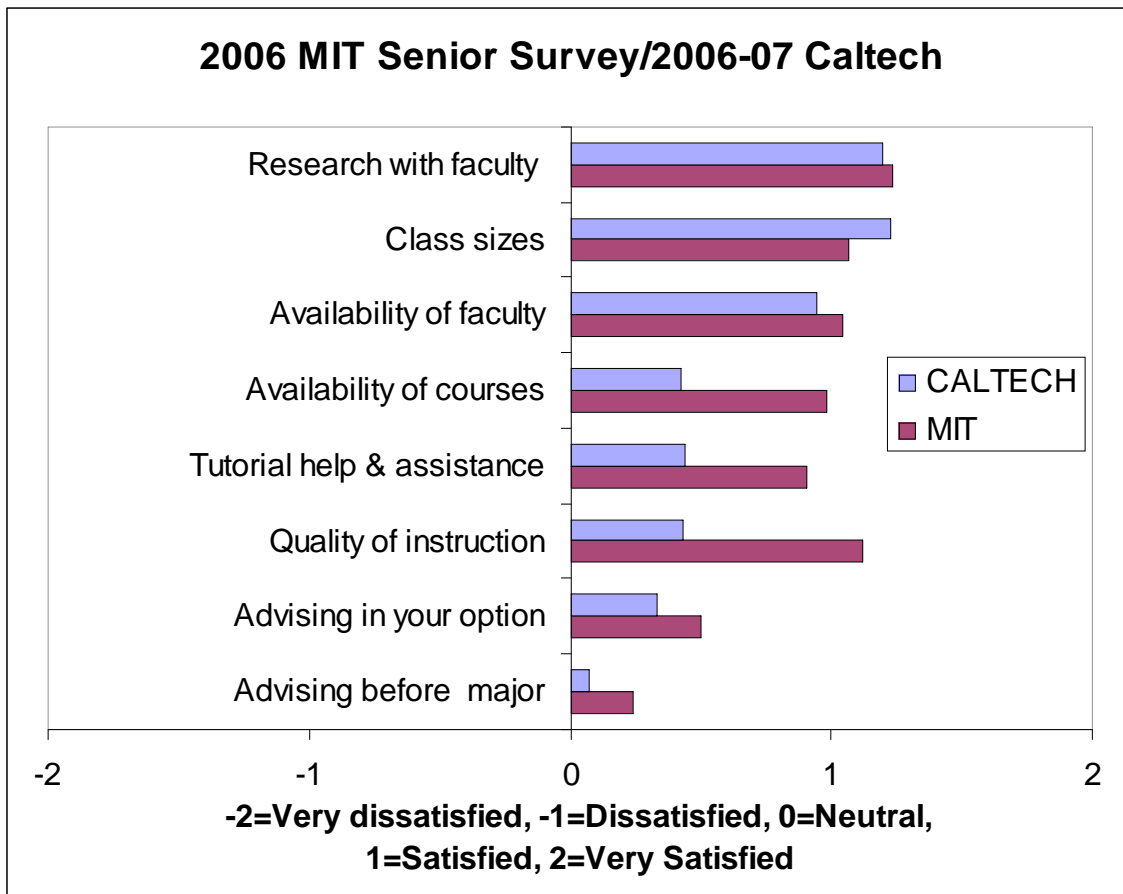


Figure 2. Responses from the senior exit surveys at Caltech (2006 and 2007) and MIT (2006) on satisfaction levels for issues associated with academics. Caltech response rate was 80%; MIT response rate of 60%.

graduates would recommend their alma mater. A further comparison with MIT involves a series of questions regarding satisfaction levels with academic issues (see Figure 2). Students from Caltech and MIT value the opportunities for research with faculty members, the class sizes and the availability of faculty. However, students at Caltech are noticeably less satisfied with the quality of teaching. At both Caltech and MIT, students are the least satisfied with the quality of advising either before or after declaring a major. The Committee also noted that the percentage of students who accept Caltech's offer of admission was 36% in 2006 and 39% in 2007; MIT had a yield of 67% in 2006 and 69% in 2007.

Research has long been a key aspect of the Caltech undergraduate program. Caltech students have the opportunity to do research with faculty members usually through the Summer Undergraduate Research Fellowship (SURF) program. This past summer 337



Caltech students participated in the 10-week SURF program, which culminates in student presentations at SURF Seminar Day; students are also required to write a final technical report on their work. Of the 171 graduating seniors in 2007, 127 students (74%) had participated in SURF at some time during their years at Caltech. Some students also participate in research through paid opportunities during the summer or school year, or do research for academic credit, such as a senior thesis. The Committee heard from students who would like to see more opportunities and more time to do research during the academic year. In addition, there are some students who never have a research experience, or are never able to find a research opportunity related to their academic area of interest.

Besides the data from the exit surveys, the Committee notes that for the past few years Caltech has had the ignoble distinction of being on Princeton Review's list of "Professor's Get Low Marks." Of the 361 colleges reviewed by their survey, Caltech faculty ranked 359<sup>th</sup> when students were asked, "Are your instructors good teachers?" Caltech is also ranked first in "Students Never Stop Studying." Understandably, the process used by Princeton Review in determining these rankings raises questions; the Princeton Review admits, "Our survey is qualitative and anecdotal rather than quantitative." The information, however, can be accessed by potential students and it contributes to an image of Caltech having an intense academic environment with insufficient concern for the quality of teaching.

In the data from the U.S. News and World Report, Caltech is the only school to boast a 3-to-1 student-to-faculty ratio. This ratio is touted by the Caltech admissions website because it "gives undergraduate students many chances to work with faculty as professional colleagues. Students are mentored very closely by faculty advisors .... This mentoring relationship provides a great opportunity for students to make connections with faculty – to learn about research group positions and to seek career advice." Although the low student-to-faculty *can* provide all of these things for our students, the Committee found that some students do not have close interactions with faculty members, including their advisors as shown by the low levels of advising satisfaction (see Figure 2).

The Caltech undergraduate education is centered on the Core Curriculum, which provides students with a broad science education based in mathematics, physics, and chemistry. In 1996, biology was also added to the Core, as was a menu course in either astronomy or geology. The Core Curriculum specifies the distribution of 255 of the 486 units required for graduation. The options require additional units, ranging from 147 units for mathematics to 272 units for chemical engineering.

In 1986, an ad hoc committee on the Core Curriculum (chaired by Professor Sunney Chan) described what they called the "Caltech syndrome":

Every fall we welcome 200 young men and women to our campus. They are without exception the brightest, the most eager, the most highly motivated and intellectually curious, and for the most part they are conscious of their destiny

with science... We, the faculty, naturally respond to this, and being enthusiastic ourselves, we frequently over respond. We manifest our enthusiasm by pitching the lectures at a higher level than necessary, by assigning challenging problem sets, and by placing unusually high demands on the students. Since Caltech courses tend to be overloaded to begin with, the added work load can be extraordinary for most of our students. It seems hardly surprising then that so many of our students appear constantly to have their noses to the grindstone. It is not clear that these students have time to digest the material, time to follow up on points or ideas that might come up during lectures or during the working of the assignments, not to mention time to develop those important and deep insights that come with seeing interrelationships between concepts and facts acquired in different courses or settings.

Although written 20 years ago, the description of the “Caltech syndrome” is still applicable today. From the surveys of students graduating from Caltech, approximately 40% of our seniors report having less intellectual confidence or self-esteem than when they started at Caltech. This number is far larger than the 18% of our seniors who report having less social confidence or self-esteem than when entering Caltech. One senior wrote, “I had always hoped that college would open doors for me and help me discover what my dreams were. Caltech is definitely not the place to find oneself. Every time I tried to develop a new interest I was faced with a class in that department that was so difficult it became soul-crushing. I leave Caltech now with no motivation to ever do anything science-related again, and not much training in how to do anything else.”

When the Committee talked with students and with some of the staff in Student Affairs, they heard the same story. Caltech is tough; sometimes unnecessarily so. Especially during the first two years, some students report that they move from one problem set to the next with little time to digest the material or to learn how to apply the concepts to new problems. They also have little time for self-exploration or for research during the academic year due to the extensive Core requirements; for some options, the additional option level requirements offer little flexibility and do not leave room for exploration.

The 1986 Chan report also described some of the other consequences of the intense undergraduate program. “The intensity contributes to premature ‘burn out’, often well before the students have even begun serious work in their chosen field of concentration. This ‘burn out’ manifests itself in many forms: indifference, cynicism and even alienation towards science; anti-intellectualism; loss of intellectual curiosity; tendency toward superficial learning with focus toward compiling a GPA rather than mastering the subject matter; and even anti-social behavior...” Although some students thrive in the Caltech environment, the Committee heard about similar consequences of burn-out, including destructive behavior blamed on academic stress.

For many students, the House system provides a supportive and welcoming environment; students appreciate the opportunity to live among friends who have similar interests in and outside the classroom. The Houses provide a resource for academic advice and peer-to-peer tutoring, as well as a social network. Students appreciate the mixing of academics

and social activities and the collaborative work environment. The family-style waited dinners available in most Houses provide students an opportunity to relax and socialize in an inclusive environment. These dinners are highly attended and are an integral part of the Caltech experience for many undergraduates.

Because of the close bonding within the Houses, students sometimes do not interact with students from other Houses unless they participate on athletic teams, musical or theater performances, or in student government. In addition, some students avoid some or all House activities. As noted in the 2001 report by the Taskforce on Undergraduate Residential Life Initiatives, “The students who separate themselves from the Houses find themselves facing barriers to participation in student/campus activities and at times harassment. Several offices detailed the ways in which the experiences of underrepresented minority students, gay and lesbian students, international students, and female students could become exacerbated due to the House cultures.” Again, the Committee heard of similar complaints regarding the treatment of minority groups and found evidence of these behaviors in some House websites, newsletters and murals.

#### **IV. Issues Associated with the Graduate Student Experience**

Most of the graduating PhD students have a high regard for their experiences at Caltech. Of the graduating students, over 80% responded that they would “definitely recommend” or “probably recommend” Caltech to a prospective student. Overall, the graduate students were positive about the relationships between faculty and students, availability of required courses and opportunities to interact across disciplines. They were less positive about the quality of teaching and about encouragement to take courses outside their program (see details in Figure 3).

Like other top graduate programs around the country, the Caltech graduate experience involves an apprenticeship. The graduate experience is dominated by the research interactions between the student and the faculty mentor. The adviser opens new research directions for the student, provides opportunities for presenting at technical conferences and authoring of research papers, facilitates professional contacts and future job opportunities. Under the tutelage of the faculty adviser, the graduate student develops into a professional, whether for a future in academics, industry, government or other professional practice. As one graduating student wrote, “My adviser and I clicked from the start; it was a perfect partnership. She gave me support, high-level guidance and permission to pursue problems that I enjoyed. In exchange, I worked like crazy for her. Together I feel that we made a big difference in our field and had loads of fun doing the science.”

Through the exit surveys, however, approximately 15% of the graduates indicated that they met or communicated with their advisers less than once per month. Some students also indicated that they never attended a professional conference, presented a paper or a

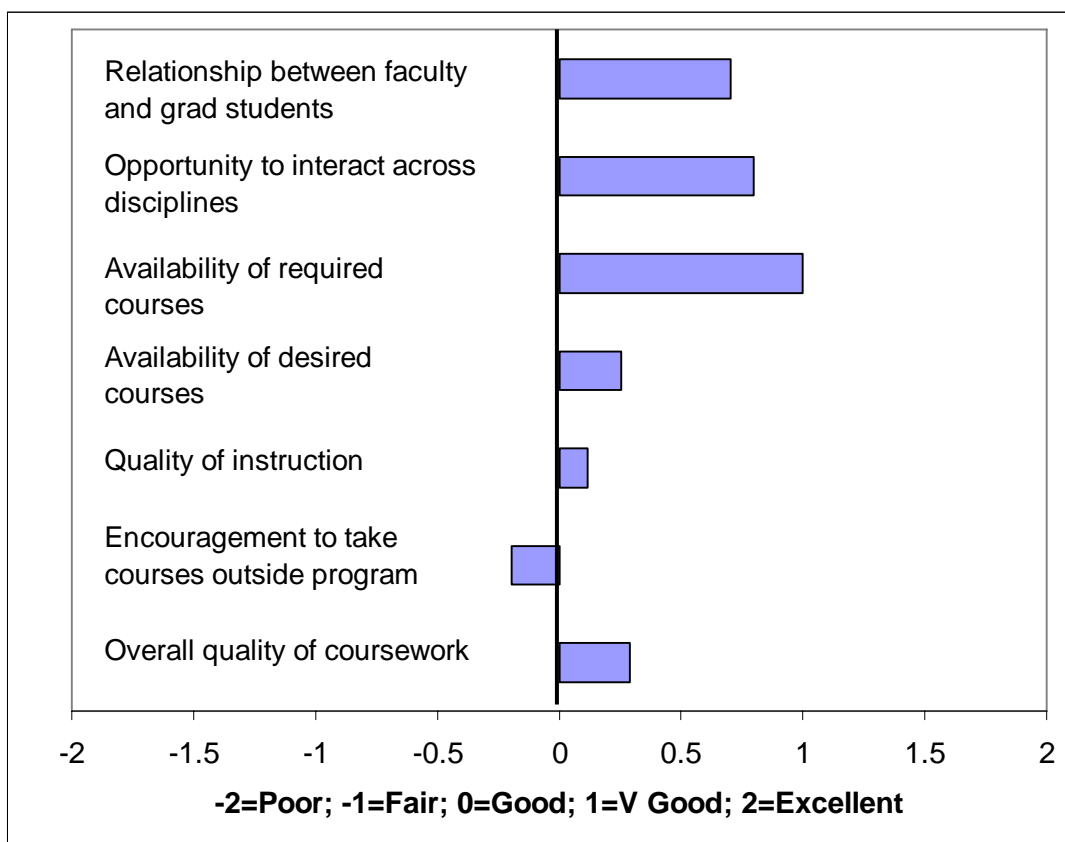


Figure 3. Results of 2006 and 2007 Caltech graduate survey when students were asked about rating various aspects of their department. Response rates of approximately 80%.

poster during their graduate career. Hence, there are some students who receive less support from their advisers than many of their Caltech peers.

According to the Office of Graduate Studies, approximately 80% of the students entering a PhD program complete their degrees. Currently, the Graduate Office does not track students who leave without completing their degree goals, or whether the completion rates vary by option or by demographic groups. The experiences of these students are naturally not included in the exit surveys of graduating students. One of the recent graduating students did capture the experience, “I had to witness the sad case of a close friend whose advisor fired her. She was the only woman in that group and had no support system to back her up. Being a quiet shy person she was unable to negotiate with her adviser and was forced to leave Caltech. To lose a brilliant person like that because of an advisor (who behaved like a jerk) is a sad testimony to the poor behavior that passes for competitive academic life.”

Currently, the average time to complete the PhD is approximately 6 years, although there are some students who take up to 10 years to complete their degree. After 6 years at Caltech, students are asked to complete a form that must be filed with the Graduate

Office in order to continue their studies. Some options do have additional requirements for students continuing beyond 6 years. Most options, however, do not.

Besides the intense research environment, the graduate student experience also involves the preparation of the graduates for their futures. Approximately 60% of the incoming Caltech graduate students intend to pursue a career in academics; some of these students are interested in opportunities that would prepare them to teach in a university environment. Several years ago, Caltech graduate students and postdocs started the Caltech Project for Effective Teaching (CPET) with the aim to “help members of the Caltech community become effective teachers through practical training, an improved understanding of pedagogy, and individual feedback.” Students also appreciate the programming and workshops offered through the Career Development Center, the Women’s Center, International Student Programs, and Minority Student Education. In addition, the Graduate Student Council (GSC) also provides programming and advocacy for students.

In 2004, the GSC prepared an extensive report on the Office of Graduate Studies. In this report, the GSC noted that the mission of the Graduate Office should be twofold: to attract the best students and to promote their healthy professional progress. Currently, the mission of the Graduate Office is primarily admissions and financial aid; the GSC suggested that the Graduate Office also offer support for teaching assistants, ensure that graduate student progress toward degree goals including intervention when necessary, assist in programming especially with regard to teaching and mentoring, advocate on behalf of all students, and assist in enforcing and educating students with respect to issues surrounding the Honor Code and the Graduate Review Board.

There was also an external review of the Office of Graduate Studies in 2004. This review indicated that the Dean’s Office should provide support for individual students, should track enrolled students and their progress towards a degree, should recruit minority graduate students and provide oversight so that option level policies are fair, transparent and consistent in their implementation by the faculty. In addition, the Office should plan strategically for anticipated changes in graduate enrollment, housing, and other issues that are pertinent to graduate programs across the country.

## **V. Issues for Caltech**

As noted in the introductory comments, the purpose of this report is to make recommendations so that Caltech’s academics and student life programs are as outstanding as Caltech’s research program. Figure 4 compares the satisfaction levels of our exiting graduate and undergraduate students. Overall, the graduate students are more satisfied with their academic and student life experiences than undergraduates. For both groups, however, there are areas that need improvement, especially in regard to teaching quality and curriculum, mentoring and advising, supporting individual students and working towards campus diversity. The Committee repeatedly heard about the need to make changes in these areas, not only from the students, but also from Caltech staff

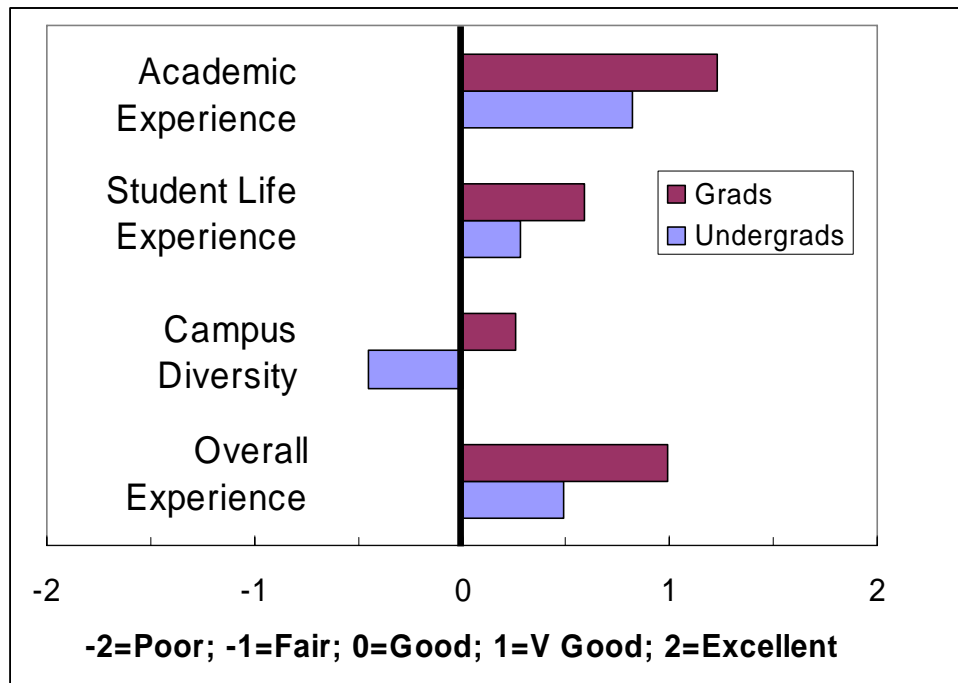


Figure 4. Responses of exiting undergraduate and graduate students when asked to rate the quality of the various aspects of the Caltech student experience. Data from 2006 and 2007 exit surveys.

and faculty. President Chameau challenged the Committee to leverage Caltech’s smallness and strong research focus as it undertakes its examination of the issues associated with the Caltech student experience. The Committee hopes that this report provides a catalyst for future changes.

## VI. Recommendations

- 1. The Institute should reaffirm its educational philosophy and its commitment to excellence in teaching, advising and undergraduate research. The Caltech administration should provide leadership on the importance of educating our future scientists and engineers. The expectation is that all faculty members participate in educating both undergraduate and graduate students and that educational excellence is a part of the Caltech reward system.**

Caltech's educational commitment is the centerpiece of the 1921 mission statement, "To train the creative type of scientist or engineer urgently needed in our educational, governmental, and industrial development." In 1968, the report on the Aims and Goals of the Institute stated, "We reaffirm our traditional aims, which were enunciated in 1921 as the pursuit of new knowledge and the education of exceptional people. We recognize that our efforts in research and education must have relevance to the aspirations of mankind, and we believe that we can best fulfill that responsibility if we take a long-range view." The report also adds, "The undergraduate operation is important and essential. The existing program has much to recommend it, but there are opportunities for major improvements which should be seized." The Committee agrees with these earlier sentiments: although areas of excellence exist within our academic programs, there is room for major improvements.

As Caltech undergoes a process of strategic planning, the Committee recommends that the *administration reaffirm its culture of excellence as it applies to education*. The Committee envisions a statement that should be developed through community input and presented to the faculty and the larger Caltech community. This statement should clearly outline the goals of our educational enterprise and how these goals will be accomplished. It should include the importance of effective teaching and advising, research for both undergraduate and graduate students, and quality student-faculty interactions. In 2006, the Faculty Board and the Board of Trustees approved Caltech's Statement of Community that "articulates the values and standards that are important to the success and health of our campus." A similar statement about the importance of high-quality teaching and advising would motivate faculty, instructors and teaching assistants and assure them that their efforts in education are expected and rewarded by Caltech. Caltech's outstanding teachers should know that their contributions are central to the mission of the Institute.

The commitment to high-quality educational efforts should also be reflected in the *processes used to evaluate, promote and compensate faculty and instructors*. In addition, the expectation should be that *all faculty members at Caltech participate in educating both undergraduate and graduate students* through teaching of courses, advising of students or sponsoring of research activities and seminars. The Committee recognizes that some faculty members are associated with graduate-only options. These faculty members can find opportunities for involvement with undergraduates through the

teaching of Core courses, advising at the freshman level, academic-year research opportunities or other avenues that involve undergraduates.

This commitment to excellence in our educational program should be done publicly, perhaps as part of a *celebration or special program that would engage both the students and the faculty*. Caltech should also develop a *website* that includes Caltech's statement on education and provides links to other educational opportunities. These will be discussed in the following sections. In addition, the website could recognize the contributions of Caltech's outstanding teachers and mentors by providing a listing of the Feynman Teaching Award Winners, as well as the winners of the ASCIT and GSC teaching and mentoring awards. This website should be linked to the ASCIT, GSC, Educational Outreach and the Faculty Guide websites. The website should also include links to Caltech's process for assessment of academic programs, as described in what follows.

The Committee also recommends that there be a *follow-up to this Committee* that would be appointed through the President and the Vice President of Student Affairs. Each year, the follow-up committee should review the progress on the recommendations and report back to the President, Provost and Vice President of Student Affairs.

**2. The Provost is the Chief Academic Officer of the Institute. As such, the Provost's Office should provide mechanisms to ensure the quality of teaching, mentoring and advising for both the undergraduate and graduate programs. In addition, the Provost's Office should provide oversight of the undergraduate program, and explore ways to assess the success of Caltech's academic programs.**

The Committee received extensive feedback about issues regarding the quality of teaching and advising at both the undergraduate and graduate levels. To understand the processes used by the divisions to handle student feedback, the Committee met with each of the six Division chairs. From these meetings, it was clear that each Division operates differently. These differences are expected because of the distinct focus and character of the Divisions. However, the Committee would expect that the Divisions could work towards a uniform standard of excellence regarding academic programs and teaching. For some of the larger Divisions, differences are also expected at the option level. Hence, the committee recommends that the Provost's Office organize *option-level discussions*, such as during a faculty meeting, to find out how the options handle teaching problems, absent advisers, unlimited-time exams, continuity in course offerings, ombudspersons, unadmitted courses, curriculum for new courses, consistency in candidacy exams, etc. These discussions could also include representatives from the undergraduate Academics and Research Committee (ARC), from the faculty Academic Policies Committee, Graduate Student Council or from the WASC-Education subcommittee. The Provost's Office should expect that each option provides a method that allows for undergraduate and graduate student feedback, as well as mechanisms by which this feedback can be implemented. In addition, each option (or division) should have a *faculty member charged with the responsibility for overseeing the feedback process* and for ensuring that



option policies are fair and transparent to the students. From these discussions, the Provost's Office ought to develop a "best practices guide" that could be helpful for the options that do not have well-established practices. This guide could then be incorporated into the Caltech Faculty Guide Website.

The *Council on Undergraduate Education* (CUE) plays an essential role in bringing together the faculty chairs of committees that impact the undergraduate student education (Undergraduate Academic Standards and Honors, Core Curriculum Steering Committee, Curriculum Committee, Academic Policies Committee), the Dean, the Registrar, the MOSH, the Vice President of Student Affairs and the student chair of the ARC plus other student representatives. Originally the CUE also had representatives from each of the divisions. Since its start, the Vice Provost has chaired the CUE. As described in the Faculty Board minutes from October 11, 2004, "CUE's method of operation is to find out what needs to be done, and to determine who will do it. It is not the purpose of CUE to usurp the traditional authority of a Faculty Committee for academic issues. Rather, it is to catalyze the relevant committees and people into doing whatever needs to be done to improve the education of the students... CUE's mandate is not to change the system, but to make the system work." Through CUE, the Provost's Office should coordinate issues that supersede the focused areas of faculty committees with the purpose of ensuring the quality of the undergraduate academic program. The CUE should be institutionalized as a Caltech Administrative Committee reporting through the Provost or Vice Provost.

Outstanding teaching requires time and effort. Caltech faculty members are often short of time and may not make teaching a high priority. The Committee recommends that the Provost's Office should explore ways to provide *incentives for high quality teaching*, such as additional administrative support, discretionary funds, or monetary awards for faculty and teaching assistants who win the ASCIT and GSC teaching awards.

Resources should be available to faculty members who want to organize a new class or an educational initiative. In most divisions, funds for educational activities come from the Division's general budgets. Hence, a proposal for a new activity within a Division may need to be prioritized against other non-instructional activities. To promote educational innovation, the Committee recommends that there be a fund that is managed through the Provost's Office to *seed new initiatives*. In addition, there may be ongoing educational program or learning opportunities, such as research tutorials, undergraduate teaching assistants or expensive project courses, which may not be adequately supported. The Institute should continue to explore funding opportunities for these programs and not place undue burden on the sponsoring faculty member.

The Provost's Office should create opportunities and provide resources to *educate the faculty* on best practices for teaching, student mentoring and advising. Faculty should have the opportunity to participate in teaching workshops or seminars either on- or off-campus; faculty may also elect to have their courses recorded and professionally critiqued. The Committee also recommends an *orientation for new faculty* that includes an introduction to educational resources on campus, the philosophy and implementation of the honor code, an introduction to the House system and other features of campus life.

In addition, there should be a session on best practices for teaching, advising and mentoring.

The Provost's Office currently maintains the system for the *Teaching Quality Feedback Reports* (TQFR), which is used by some options at Caltech. The Provost's Office should continue to expand this service to interested options and should ensure that the system provides feedback in a timely manner. Faculty should actively encourage their students to participate in the TQFR system. Currently, there is no filtering of the feedback from students. The Provost's Office should consider a process that would remove comments that are offensive or personal. In addition, the academic portions of the recent *exit surveys* for graduating students should also be reviewed through the Provost's Office. The academic results of these surveys, including student comments, should be distributed from the Provost's Office to the appropriate divisions or options. The Provost's Office should also interact with the student ARC committee and help implement the recommendations from the Student-Faculty Conferences. The Provost's Office should interface with the Caltech Project for Effective Teaching.

Through discussions with the division chairs, the Committee noted differences regarding the importance of teaching and advising in evaluating the faculty for *tenure and promotion*. The Committee recommends that the Provost's Office ensure that the materials and metrics used in evaluating these contributions be consistent throughout the divisions. The committee also noted that each of the six divisions receives feedback through an external *visiting committee* every three years. The Institute should request that each of the visiting committees provide an assessment of the quality of the division's teaching and advising.

The Committee also discussed assessment of the effectiveness of Caltech's educational programs. Every ten years, the Institute undergoes an *external review* by the Western Association of Schools and Colleges (WASC). As described in the introduction, the current WASC assessment process is looking at Institute-level issues including the honor code, undergraduate research, and teaching quality and workload. The Committee recommends that the review process not be limited to the years preceding a WASC visit; an evaluation process should involve a continuous and ongoing examination of our program. Caltech should have a public listing of our educational goals and values, educational outcomes of our program (what students learn from attending Caltech) and a clear understanding of the measures that will be used in assessing our program. The findings of this process should be discussed with the faculty and continuously revisited and, if necessary, revised to improve our educational program.

The Provost's Office should also look at mechanisms to assess specific academic programs. How do we evaluate the value of a Caltech degree? Are we improving? The Committee recommends that the Provost's Office initiate a *limited review of possibly one graduate program and one undergraduate program* (these programs would of course have to agree with the process) beginning next year. The review would involve an assessment of the attitudes, skills and knowledge of the discipline of students entering and exiting the program, an evaluation of degree completion rates, career placement,

research productivity, as well as long term measures of professional success. The results of this assessment would be used to improve these programs. If successful, the process could be expanded to other options.

- 3. The Core Curriculum should be reviewed for content and breadth. In reviewing the Core, the Committee recommends that the undergraduate program have sufficient flexibility to allow students to participate in academic-year research and to provide opportunities for freshman to interact directly with faculty. The review should also consider the range of backgrounds of incoming students, the scheduling of the Core courses, and the use of grades in the third term of the freshman year.**

As described in the 1986 Chan report, the Core Curriculum is designed to give students a “liberal science education” by providing students with fundamentals that transcend any one field. “Caltech takes considerable pride in graduating biologists who understand the laws of quantum physics and can apply them to their molecular biology, neurobiology or biophysics, surface and materials scientists who can design new processes and materials based on modern chemical principles and physical concepts; and electrical engineers and computer scientists who can invent new logic circuits, or develop computer software founded on modern mathematics.” Is Caltech’s Core Curriculum successful in its mission of training students in the fundamentals? Do students retain this knowledge and learn to apply these fundamentals to interdisciplinary problems?

The Core Curriculum is a defining feature of Caltech’s undergraduate program. However, it was last reviewed in 1996. The Officers of the Faculty, in consultation with relevant faculty committees, should form an *ad hoc committee to revisit the Core*. The ad hoc committee should include members from outside the Core Curriculum Steering Committee, who may have a new perspective on the education required of all Caltech undergraduates. The Committee suggests that the ad hoc committee on the Core Curriculum address the following questions: Does our Core Curriculum provide the liberal-science education needed for the 21<sup>st</sup> century? If we were to redesign the Core Curriculum, how can we leverage Caltech’s small size and its focus on research?

In rethinking the Core, the faculty should *clearly articulate the purpose and goals of the Core, the learning outcomes* (what students learn from the Core), and a process by which the success of the Core curriculum can be assessed. The assessment should measure the material retained by the students and the ability of the students to apply material from the Core to new problems. The goals of the Core, the learning outcomes and the assessment process should be clearly communicated to the students so that the students have a better appreciation for Caltech’s educational philosophy. A reexamination of the Core should not involve additional requirements without a corresponding subtraction of requirements.

Research is the foundation of Caltech. The SURF program provides many of the Caltech undergraduates an opportunity to participate in ten weeks of research during the summer. Students, however, also want to do research during the academic year. With the current

Core, students have little flexibility, which severely limits their ability to do research especially in the first two years. In examining the Core Curriculum, the ad hoc committee should *explore ways to provide more flexibility in the program or to reduce the course load so that interested students can have a longer-term research experience* with a faculty member that spans more than a quarter or a summer. Options should also explore ways that research work could be used to fulfill option requirements.

The Committee also notes that in some of the more popular options there may *not be sufficient research opportunities* either during the summer or the academic year. Although Caltech sells our research focus to prospective freshman, there is no guarantee that students will be able to participate in research in their field (the distribution of Caltech graduates among the different majors is given in the appendix). Caltech should look for ways to assist students in finding research opportunities, possibly through the Office of Student-Faculty Programs. In addition, Caltech should ensure that funding is not a limitation in supporting undergraduate research.

The current Core relies on large lecture courses, which may be staffed by high-quality teachers. However, even with the best teachers, these courses do not promote direct interaction or mentoring relationships between students and faculty, especially in the freshman year. Currently, there are examples that do facilitate interactions, such as the research tutorials Ph 11 and Bi 23 or the freshman frontier courses found in chemistry, biology and geology; these courses also serve to excite students about scientific research. Similar courses, however, are not found in all options, or may be so large as to make student-faculty interaction extremely difficult. In reviewing the Core, the Committee recommends that the faculty explore additional mechanisms that *facilitate direct student-faculty interactions*. Caltech students want to explore research directions and future career paths; quality connections with the faculty play an important part of this process. The goal of increasing connections with the faculty may be accomplished by additional research tutorials or frontier courses, or by introducing new programs, such as a freshman seminars as those found at many of our peer institutions.

The Committee also recommends that the ad hoc Core Curriculum committee examine the mechanisms by which students with *different levels of high school preparation are introduced to the Core to ensure that they are not being overloaded*. Before entering Caltech, students are sent diagnostic exams in mathematics, physics, chemistry and writing. If they do not have sufficient preparation for mathematics, students are placed in Ma 1a section 1 (12 units rather than the typical 9 units for Ma 1a), which provides more work in calculus than typically given in Ma 1a. These students are then required to take Ma 1d, a 5 unit course during winter term in addition to taking Ma 1b. Students who need additional practice in problem solving may also be advised to take Ma 8 (3 units) during fall term. In physics, the diagnostic exam is used in placing students into sections of Ph 1. Students with exceptional backgrounds may be placed in advanced courses of math, chemistry or physics, although an additional exam may be required. If the student needs support in writing, the students are either assigned to En 1ab (English as a Second Language, 9 units each term) or En 2 (Basic English Composition, 9 units). These courses do not count towards the Core requirements in the humanities or social sciences.

In reviewing the Core, the ad hoc committee should also ensure that the *scheduling of classes* avoid conflicts with other Core courses, and with courses, recitation sections and laboratories typically taken by first and second year students. The scheduling of due dates for assignments in these courses also needs to be coordinated to ensure that they are distributed throughout the week. In addition, the Committee recommends a review of the *pass-fail grading system*, which is limited to the first two quarters of the freshman year. The 1996 Core review also suggested that the grading system be reviewed in a one to two year time frame; it is unclear that this review ever happened. With the current policy, students are introduced to physics, math and chemistry without pressure of a letter grading system. The same, however, is not true for the introduction of students to their first course in biology, which is only available on grades in the third term.

**4. The Committee recommends steps to improve the academic environment and to reduce stress on students by monitoring the number of hours required in courses, by introducing feedback within the term, by providing opportunities to develop better study habits, and by improving the tutoring system through the Dean's Office.**

Caltech demands much of its students. However, Caltech should look for ways to reduce the “Caltech syndrome” (as described on page 9) and allow students to absorb and retain the material covered in courses and to develop skills that allow them to learn for themselves. Caltech should look for ways to move from an environment in which students “never stop studying” to an environment in which they “never stop learning.”

Overloading of Caltech students is not a new problem. In 1968, the document outlining Caltech's Policies and Procedures (as referenced by the 1986 Chan report) recommended the following: “The Faculty has gone on record as definitely opposing the overloading of students through the requirement of more time in class, laboratory, or outside preparation than is allowed by the number of units allotted to a course. Instructors should use great care in determining that *a significant proportion* of their students do not find it necessary to put in extra time in laboratories, on laboratory reports or on homework.” In keeping with the recommendation made in 1968, the Committee strongly recommends that CUE and the associated faculty committees ask the options to review the work load so that students are not overloaded. Is there non-essential material that can be eliminated? Do the students have the background and the tools needed to complete the homework assignments and laboratories in the allotted time? Are there problem sets that require excessive “grunge work”?

The TQFR questionnaires ask students to self-report the number of hours spent on a class, including homework, labs, tests, class attendance and preparation. In addition, there is a second question that asks if the course requirements exceed the units associated with the class. This data are shown in appendix for the Core Courses over the past 3 years. The data show that there are several courses that exceed the stated workload. The Committee also notes that the self-reporting of hours varies little from year-to-year; hence, this

feedback mechanism seems not to have been effective in changing the workload in some courses. The Committee also wonders if faculty members pay attention to the student comments. The Committee recommends that faculty use the *TQFR feedback* both for setting reasonable workloads for their students and for providing valuable information on how to improve their course. The Committee also recommends that the Division chairs review the TQFR data for courses within their Divisions.

Faculty can also ask students to *report on their homework or laboratory assignment the number of hours spent during the week* (including lecture or laboratory hours) on the course. This mechanism provides week-by-week feedback to the faculty member. Students also noted that they appreciate mechanisms to give anonymous feedback. The options or CUE may want to explore ways via email or websites to allow for anonymous midterm feedback, which would enable the faculty member to make mid-course corrections rather than having feedback only at the end of a quarter.

The TQFR data also shows the percentage of courses that students attend. In the non-laboratory Core courses, the percentages range from approximately 30% to approximately 85%. In the senior exit surveys, the most common reasons that students cited for missing class were: the poor quality of teaching; they found it more efficient to read the book and notes outside of class; and they were sleeping. The Committee recommends that the faculty look for *creative ways to attract students back to the classroom*. Clearly, improvements in teaching quality will help. Caltech students are receptive to engaging well-prepared lectures. Previous suggestions by the 2005 and 2007 SFC Quality of Life Committee were to make attendance part of a student's grade, to provide examples that are not found in the course reading material, to give a short quiz each day and to include material in lectures that is necessary for the homework. Students are also receptive to demonstrations or visual representations of the material. In some classes, faculty post on-line notes. Although detailed notes may be useful for reviewing the material, these notes may also be the reason that students feel that it is more efficient to just read the notes than to attend class.

The Committee also recommends that faculty should establish *regular office hours*, despite the fact that many faculty members remark that students do not come. Hence, students must actively be encouraged to use the office hours. At the beginning of the term, faculty should consider assigning a 5-10 minute time period to meet individually with each student, which may help to promote interactions later in the quarter. Student participation in office hours could be one part of the first homework assignments. Besides giving students direct interaction with the faculty, faculty office hours are an effective way for the faculty to get real-time feedback on how the course is progressing. Besides office hours, faculty are encouraged to use the support that is offered from the Dean's Office to take students in their classes to lunch or to dinner.

The TQFR results indicate that some students struggle and spend long hours on some courses. Caltech enrolls students from a range of backgrounds, and it should be expected that some students are better prepared than others. In high school, these students probably did not ask for help; instead they provided help to their classmates. The Dean's Office

currently runs a *free tutoring service* for students who request help. For students needing help in writing, the Hixon Writing Center also offers a tutoring service. However, there seems to be an enormous barrier for a first year Caltech student to overcome before asking for assistance, which may be why few students take advantage of these services. We need to ensure that students are comfortable asking for support. The tutoring services should be advertised to students, faculty and teaching assistants. Students who need help should be encouraged to use the available services. The Committee also recommends that the tutors have training so that they are properly prepared to assist the students. In the humanities, the tutors from the Hixon Writing Center visit each of the freshman humanities courses to explain the available tutoring services.

Although our incoming students excelled in their high schools, they may not have developed the study habits that are required to excel at Caltech. The Committee heard that students usually do not prepare for classes or laboratories by reading the material ahead of time; they may not review the material after lecture; they may not take the time to learn from their prior mistakes. They may only focus on completing the next problem set rather than mastering the material. The Dean's Office should provide support for students to develop effective study skills. The Committee also heard about the reluctance of students to ask questions of faculty members or of teaching assistants. In high school, our Caltech students were probably answering questions for their friends and teachers. At Caltech, they are reluctant to ask questions. The instructors of the introductory courses need to be aware of and sensitive to the limitations and accomplishments of our students; they should *encourage discussion and questions*. In some courses, student participation is a requirement. In courses in which participation is not required, faculty may want to consider requiring discussion periods, or requiring students to work through problems verbally in class.

Past reports have also suggested other mechanisms to reduce student academic stress. The Committee recommends that homework should not be given during *midterm week*. Faculty should also make every effort to distribute the work load evenly across the quarter. The WASC-Education subcommittee should continue to investigate ways to increase students' learning and retention, and to decrease the aspects of the student work load that do not enhance this learning.

The Committee also notes that the *physical education and performance and activities classes* are well-received by the undergraduates. Caltech should continue supporting these courses because they provide opportunities for students to relieve stress, interact with fellow Caltech students and enjoy themselves. The Registrar should continue to preserve the 4-6 pm time slot for the P.E. courses. A similar time slot for P.A. courses would be useful.

- 5. The Dean's Office and the Graduate Studies Office should develop processes to monitor and to evaluate the reasons why students leave Caltech without completing their degree goals. These offices should also look at our policies regarding overloads, underloads, extensions and leaves of absence.**

From the exit surveys, Caltech now has information on the satisfaction levels of the students who complete a B.S., M.S. or PhD degree. We do not, however, have comparable information on students who leave Caltech without finishing their degrees. Why do these students leave? Do students leave Caltech and enter another university? Do students continue to pursue science or engineering? Are they unhappy with the environment at Caltech? The Committee recommends that the Dean's Office and the Graduate Studies Office develop *mechanisms to tabulate and understand why students prematurely leave Caltech.*

In addition, the Dean's Office should do a systematic study of the use of *underloads, overloads, and leaves of absence*; they should also look at the use of *E, I and W* grades. Do our practices and policies help or hinder a student's progress towards degree completion? The Committee also recommends a review of the policies on the use of a *medical excuse* to allow for extensions on homework or exams.

The Graduate Studies Office (GSO) should also look at *medical and non-medical leaves for graduate students.* Before a student takes the leave, the Graduate Office should ensure that there is a clear understanding between the student, the faculty adviser, and the option about the terms for returning to Caltech. The GSO should provide sufficient support for a student returning from a medical leave.

The Committee recommends that these studies should be *shared with the appropriate faculty committees.* The Committee envisions that these studies will be helpful in improving our processes for admission and for retention of students.

**6. The Vice President of Student Affairs should be a Caltech faculty member. The positions within Student Affairs involving faculty (such as the Deans) should be attractive so that faculty members can be recruited to these positions. Faculty should be encouraged to interact with Student Affairs so that the support and education of Caltech students is a partnership between the faculty and the professionals within Student Affairs.**

The Committee recommends that the *Vice President of Student Affairs* (VPSA) be a member of the Caltech faculty. The position is nominally a half-time so that the faculty member may also continue with research and teaching; however, the Vice President may elect to spend additional time doing the job. The responsibilities of the Vice President should be clearly defined and be focused on providing support and services for students.

The positions of Dean of Students, the Dean of Graduate Studies and the MOSH are also nominally half-time positions. These positions play an important role in our educational program. The Committee recommends that Caltech administrative strive to make these *positions attractive* so that faculty members can be recruited to these positions.



The *chairs of faculty committees*, such as UASH, Freshman Admissions, Core Curriculum Steering Committee, also play a critical role. Support should be provided to these committee chairs. Because these positions interact significantly with activities in Student Affairs, the faculty nominating committee may want to consult with the Vice President of Student Affairs for suggestions for faculty to serve in these positions.

The Caltech faculty and the professional staff within Student Affairs should act as a partnership, *providing leadership and oversight of Caltech's academic and student-life programs*. Often faculty remark that they do not know what happens within Student Affairs. Student Affairs should clearly articulate their goals and mission. The Vice President of Student Affairs is encouraged to meet with faculty, especially new faculty members, to educate the faculty on the role and services of Student Affairs.

- 7. The Office of Graduate Studies needs to clarify its role and mission at Caltech. The Office should help to ensure proper support for the graduate students, especially in situations involving conflicts between a student and adviser. The Graduate Office should interface with the Graduate Student Council, explore ways to continue recruiting minority graduate students, and coordinate a review of the honor system as it applies to graduate students.**

The Committee recommends that the Dean of Graduate Studies working with the Vice President of Student Affairs and the Caltech administration *clarify the role of the Office of Graduate Studies*. Currently, the Office of Graduate Studies primarily focuses on graduate admissions and the processing of applications and financial aid offers, graduate student payroll, and thesis and degree audits. In 2004, there were two reports on the operation of the Office of Graduate Studies, the first was prepared by the GSC, and the second by an external review team of Graduate Deans from other universities. Both of these reports suggest a larger role for the Office of Graduate Studies. The Committee supports these reports and recommends that the Graduate Office embark on a self-study of its role at Caltech. The mission of the Office of Graduate Studies should be articulated to the Caltech community. The two reports provide a valuable starting point for this activity.

Moreover, both reports support strengthening the Office of Graduate Studies in its role of *supporting individual graduate students*. The advisor-student relation is the foundation of the graduate student experience. For many graduate students, the relationship with his or her adviser lasts a lifetime. In some cases, however, the relationship between the student and the adviser may become problematic because of personality conflicts, changes in the research direction of the faculty member, illness, departure from the Institute, loss of funding, or other reasons. The 2004 external report describes the treatment of some graduate students by their advisers as employees rather than potential colleagues or future professionals, or as workers who are not expected to have a social life. In these situations, the Office of Graduate Studies working with the option should ensure that the student is supported and treated fairly. Whenever possible, the Office of Graduate Studies should work to resolve the situation so that the student can continue graduate work at the

Institute. In addition, the Graduate Office should be responsive and act as a referral center for graduate students looking to resolve issues that are typical to students, including housing, visas, and health insurance.

The 2004 external review also recommended that the position of Dean of Graduate Studies be converted to a Vice Provost who would report directly to the Provost. Although the Dean's position was not converted, the Dean of Graduate Studies did begin to report both to the Vice President of Student Affairs and to the Provost. The external reviewers argued that within the Provost's Office the Dean's position would be more attractive to a faculty member; they also argued that the Dean could more effectively advocate for graduate students across the campus. "From this platform, the Dean would be in a far better position to support and oversee the academic programs in the divisions..." Although the Committee is uncertain as to whether the Dean should continue to report through the Provost's Office, especially with the return to a faculty member as the Vice President of Student Affairs, the Committee does agree that the *relationship between the Dean, the Division Chairs and the Provost should be strengthened*. As described in the report, the Dean should meet regularly with the Division chairs so that the work of the Graduate Office reflects issues that arise in the Divisions. The report notes that options operate under a "wide variety of practices and requirements." The Dean should ensure that these "local policies be fair and transparent to the graduate students and implemented consistently by the faculty. The role of the Office of Graduate Studies is to verify this with minimal overhead." To be successful, the faculty and options must be willing to work collaboratively with the Graduate Office in supporting the welfare of all graduate students.

Both reports also note issues with the staffing levels within the Graduate Office and suggest a need for an associate Dean of Graduate Studies. The Committee notes that recently a position within the Graduate Office was converted to an *Assistant Dean*. This position should have visibility so that graduate students and others know that the Assistant Dean is available to assist students with issues. In addition, both reports suggest that the Office of Graduate Studies should be active in *recruiting minority graduate students*. The Committee notes that in past years the Graduate Office has been proactive in this area, even with limited resources. However, the Graduate Office cannot be successful unless the options, as well as the entire Caltech community, have a similar commitment to diversifying the student body; the Office of Graduate Studies also needs resources to effectively support this recruitment effort.

The Graduate Office should also work to strengthen its *working relationship with the Graduate Student Council*. The graduate students use the GSC to voice their opinions and needs. The Graduate Office should regularly communicate with the GSC on issues that are relevant to the graduate student population. The GSC and the Office of Graduate Studies should work collaboratively on ways of supporting graduate students.

The Office of Graduate Studies should also support a *review of the processes surrounding the honor system for graduate students*. Currently, the undergraduate processes involving the honor code are being reviewed by the WASC-honor code

subcommittee. This committee involves undergraduates, faculty, and Student Affairs professionals and is looking at issues that may also affect the graduate honor code, such as the applicability of the honor code to non-academic issues. The Committee recommends that the Graduate Office form an honor code review committee using a similar process that involves faculty and students, open discussions, input from constituencies, data collection and analysis. The Committee also expects that the review process will help in coordinating the expectations and processes between the Graduate Review Board and the undergraduate Board of Control.

- 8. Caltech should redefine and reorganize the residential life program for students to facilitate the integration of students' academic and non-academic lives. Caltech should create a position of assistant or associate Dean of Residential Life within the Office of the Dean of Students. The Committee recommends changes to the Resident Associate, Upper Class Counselor and Health Advocate programs, and a reaffirmation of the role of the MOSH. The faculty, administration and students must recognize and respect the careful balance between student self-governance within the Houses and Caltech's responsibility for ensuring a healthy and safe environment for all students.**

The Committee strongly endorses the *creation of a position for an Assistant or Associate Dean of Residential Life reporting through the Dean of Students*. By centralizing the oversight of students' nonacademic and academic lives within the Dean of Students Office these two areas of responsibility will be integrated to allow for better support of students' lives both inside and outside of the classroom. The Assistant/Associate Dean would be responsible for ensuring the well-being of students within Institute housing. In consultation and collaboration with the Dean of Students, undergraduate House leadership, graduate student leadership, and the Housing Office, the new Dean would develop policies and an approach that ensures the welfare of students while respecting and strengthening the balance between the Institute's responsibilities for their welfare and the unique role of student self-governance within the Houses.

To be successful, the new Dean should possess certain *critical experiences and qualities and receive sufficient support* from the administration in his or her efforts. The residential life Dean should have an advanced degree in Student Affairs or a related field, have a solid background in residential life programs, be knowledgeable about current laws that regulate student housing and activities, and be able to take a collaborative approach in the development of policies that govern student life in the Houses. He/she must demonstrate respect for student house leadership and the principle of student self governance at the same time as he/she will be guided by the Institute's responsibility for student welfare in the Houses.

The Dean's Office, in consultation with the Office of Graduate Studies and undergraduate and graduate students, should reconsider and redefine *the role of the Resident Assistants (RAs)* in the undergraduate and graduate housing. Because the RAs are graduate students who live in Institute housing with the responsibility of caring for

students, they are in a unique position to serve as mentors to undergraduates, both in terms of their academic and nonacademic lives. Currently the RAs report to the Housing Office, and have been given the responsibility of enforcing housing rules and policies. The unintended result is that the RAs have been viewed by the undergraduates as administrators rather than mentors. The RAs have the responsibility of ensuring the enforcement of policies that address the safety and emotional welfare of students, and they should not be given responsibilities that undermine this role. Because the RAs are also graduate students, they have responsibilities in laboratories and research groups. Under the Dean's Office, the Committee envisions that the responsibilities of RAs who are graduate students will be better appreciated and coordinated vis a vis their academic responsibilities. The Dean's Office should also review the process for selecting RAs and ensure that student input is included. The new Dean and the RAs will also help support the "academic safety net" within the Houses by interfacing with the Dean's tutoring program and helping to ensure that students get the academic support that they need.

The Dean's Office should revisit, in consultation with legal counsel, the *compensation that RAs receive* for their responsibilities. Recently the stipend they receive was eliminated due to overtime considerations, at the same time as the RAs assumed more administrative responsibilities from the Housing Office.

The *Upper Class Counselors (UCCs)*, undergraduates who live in the houses and are selected by students, have the potential to serve as an important part of the safety net for undergraduates along with the Resident Advisors and Health Advocates (as described below). Currently the role of the UCCs varies from House to House, and some Houses do not have a UCC program. In an effort to strengthen the safety net for undergrads the Committee recommends that all Houses have UCCs, and that the UCCs have training to provide emotional support to the other students living in the Houses. In some Houses, the UCCs may have additional responsibilities. The new Dean should work closely with the House leadership to realize these goals and consider ways to compensate students who serve as UCCs.

The *Health Advocate Program* is administered by the Health Center and is staffed by undergraduates living in Institute Housing. Their primary responsibility is the physical and emotional well-being of students. They are trained in advanced first aid and peer counseling skills in a year-long class for which they received academic credit. The Health Advocate program should be integrated into the larger safety net within the Houses. By working collaboratively with the RAs, UCCs and House Leadership, the safety and emotional and physical well-being of undergraduates will be effectively provided.

Each year some students move out of the undergraduate Houses. A primary reason is that there is not enough room to house all students within the on-campus student Houses. Although all incoming first year students are housed on campus and priority is given to upper-class students for on-campus housing, some sophomores and juniors are forced to move off campus. In addition, some students move off campus because the *culture of the Houses makes them feel uncomfortable or unwelcome*. Currently no one office has the

responsibility of tracking the reasons students leave the Houses. The Committee is left with only anecdotal information and impressions with no clear understanding of the number of students who leave. The new Dean would have the responsibility to determine the numbers of students who leave for these reasons, consider ways to support these students and work with House leadership to create an environment that is supportive and welcoming to all students. Implementation of this recommendation will help the Dean's Office ensure that House environments provide a residential life program for all students that reflects Caltech's values. Caltech is responsible for upholding laws and Institute policies including those preventing harassment, discrimination, and alcohol and drug abuse. To ensure a welcoming environment for all students, the community must understand and value the purpose and spirit of these laws.

The *Master of Student Houses* (MOSH) can help to support the goal of integrating students' academic and non-academic lives. Twenty years ago, the MOSH lived in Steele House and served as the faculty director of the student houses. When the responsibility became more complex and time-consuming, a professional was hired to oversee the day-to-day activities within the Houses. In 2002, a committee of faculty, undergraduates, staff and RAs recognized the importance of the MOSH position and recommended the MOSH have three primary responsibilities. First, the MOSH should act as a liaison between students and faculty to foster interactions and to increase communication. In this regard, the report from the committee suggested that the MOSH have a standing invitation to the meetings of the Faculty Board and to meetings of the IHC and ASCIT. Second, the MOSH should continue to organize cultural events and fund activities that involve faculty and students. Third, the MOSH should take an active role in coordinating the House Associates, the Avery Associates and the Avery faculty in-residence program. The Committee recommends that the suggestions of the previous committee should continue to define the role of the MOSH as it furthers the goal of integrating students' academic and non-academic lives.

Currently many of the programs that add to the enrichment of student life within the Institute Houses are funded through room and board charges administered by the Housing Office. If the responsibility for student life is moved into the Dean's Office, an arrangement must be made to ensure *the financial viability of a residence life program*. This will require a stated agreement for funding these efforts between the Dean's Office and the Housing Office and their collaboration to continue to enhance student life. The Committee also recommends that *funds for student activities*, such as parties, movies, trips, etc, be determined through a committee structure with representatives from various student groups.

The Committee also heard of issues surrounding the conditions of the student Houses and the graduate residential housing program. The Committee recommends greater communication and cooperation between the students and the Housing Office regarding the *conditions and upkeep of these housing facilities*. The faculty Housing committee should be a participant in these conversations, and help to ensure the long-term upkeep of Caltech's facilities.

**9. The Institute needs to continue to diversify the student body and faculty. The administration must provide leadership on diversity issues; it should reconsider the mission of the Administrative Committee on Diversity and Minority Affairs (ACODAMA), which reports to the President.**

Caltech must continue its efforts in diversifying the student body, faculty and staff (the distribution of students by gender and option is given in the appendix). As stated in Caltech's Statement of Community in 2006, "We are dedicated to creating and sustaining an environment in which diversity will flourish." To this end, the Institute should ensure that the procedures and practices for searches and promotions are consistent with the *goal of achieving greater diversity* and with guidelines on nondiscrimination and equal employment opportunity.

In recent years, the *Diversity Progress Group* (DPG) and the *Administrative Committee on Diversity and Minority Affairs* (ACODAMA) have been the two committees looking at diversity issues across campus. The Diversity Progress Group was initiated through the President's Office as a working group that included representatives from across the campus. The focus was on strategic planning for diversity initiatives, including the sponsoring of the annual Diversity Retreat. The group also looked at climate issues, and developed the process that led to the Statement of Community. This group, however, is no longer active. ACODAMA is appointed by the President and includes staff, students and faculty, and the Vice President of Student Affairs. The committee is charged with serving as the primary conduit for discussions and administrative policy recommendations on advancing diversity, minority affairs and gender issues on campus. The committee tracks and assesses the progress of diversity initiatives, serves as a campus liaison for the Office of Minority Student Education, and evaluates proposals to the President's Diversity Initiative Fund.

With a new President and Provost, the Committee recommends *a review of the charge to ACODAMA, and an overall review of the offices handling diversity activities* across campus. The Committee also recommends that the DPG, or a group with a similar focus, be reconvened.

**10. To promote interactions with the Caltech Trustees, the Committee endorses the establishment of a Trustee committee that focuses on the Caltech student experience. The proposed Trustee committee should include two student Advisory Members, be involved in the assessment of the academic programs, and provide opportunities to interact with the students in social and academic settings.**

The Committee encourages the establishment of a Trustee committee to look at the Caltech student experience. The Committee also suggests that there be *at least one undergraduate and at least one graduate student to serve as Advisory Members* to the

Trustee committee. These student Advisory Members would provide regular input to the Trustees on current issues facing Caltech students.

Because the Trustees are custodians of the Institute, the Trustees should also be involved in the *evaluation of the academic programs* of the Institute. The proposed committee could interface with the processes involving the assessment of our academic programs, as described in recommendation 2. Through the student experience committee, the Trustees could also be included in the Student-Faculty Conferences and other events that provide feedback from the students to the Institute.

Currently, the Trustees have limited interactions with students, except during the reviews by visiting committees. The proposed Trustee committee on the student experience would provide an additional mechanism for the Trustees to *meet the students in social and academic settings*. The Committee suggests that the MOSH's role be expanded to include organizing social and cultural events both on and off campus that involve the Trustees and undergraduate and graduate students. The Committee also recommends that the Trustees occasionally include presentations by a graduate or undergraduate student, rather than limiting the research interactions with the Trustees to faculty. Caltech students are also interested in *networking* with Trustees; some Trustees have hired Caltech undergraduate and graduate students. The proposed committee could look for ways to facilitate these interactions.

# **Report by the 2007 Committee on the Caltech Student Experience and Student Affairs**

## **Appendices**

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## 2007 Caltech Student Experience and Student Affairs Committee

From J.L. Chameau and J.F. Hall

1. Is Student Affairs successful in its roles of supporting students? In considering this question, the Committee should define what the key aspects of the student experience at Caltech should be, including integration of curricular and extra-curricular activities. This is certainly the key question to be addressed by this committee.
2. Does faculty interaction with students need to be increased or made more effective? If so, how? In considering this question, the Committee should investigate interaction with students in general, as well as the interaction of faculty with Student Affairs, including how well the faculty committees interact with Student Affairs.
3. Student Affairs cover a myriad of organizations and offices. Is the current office and management structure appropriate and effective? In addressing this question, the committee should identify what are the critical core activities of Student Affairs.
4. Because of the diversity of programs under Student Affairs, the duties of the Vice-President cover a large spectrum. Are there opportunities to streamline or restructure Student Affairs? As one example, do the auxiliary services need to be overseen by Student Affairs? Are there programs that could be handled differently or in different offices at Caltech (the committee is encouraged to look at and submit different alternatives)? Note: questions 3 and 4 are closely related.
5. The trustees have expressed the desire for a stronger involvement with students and Student Affairs. What would be the most effective means to leverage this interest?
6. The issues raised in questions 1 to 5 have implications on the duties and thus capabilities of the Vice-President of Student Affairs. Your recommendations on the capabilities needed will be appreciated. In addition, you should evaluate different alternatives for the position of Vice-President in the President's office. Alternatives do exist, such as Vice-President and Dean of Students, Vice-Provost for Academic Affairs and Dean of Students, etc. It is an appropriate time to have such discussions since a new provost will be named this spring and opportunities will exist to re-structure and optimize the effectiveness of the President's and Provost's offices.

### **Committee Members:**

Kevin Austin, Senior Director, Health/Counseling

Alex Brown, Graduate student

Will Ford, Graduate student

Scott Fraser, Anna L. Rosen Professor of Biology and Bioengineering

Ricky Jones, Undergraduate

Gary Lorden, Professor of Mathematics

Chris Moody, Undergraduate

Caleb Ng, Undergraduate

Doug Rees, Roscoe Gilkey Dickinson Professor of Chemistry

Joann Stock, Professor of Geology and Geophysics

Adrienne Stroup, Undergraduate

Catherine Ward, Graduate student

Cindy Weinstein, Professor of English

April White-Castaneda, Director Staff Education & Career Development

Melany Hunt, Professor of Mechanical Engineering

### 2007 US News and World Report Rankings

	Princeton	Harvard	Yale	Caltech	MIT	Stanford	U Penn	Duke	Columbia	Dartmouth
Rank	1	2	3	4	4	4	7	8	9	9
Overall score	100	99	98	94	94	94	93	92	89	89
Peer assessment score	4.9	4.9	4.9	4.7	4.9	4.9	4.5	4.5	4.6	4.4
Graduation and retention rank	2	1	3	20	8	7	8	8	8	6
Average freshman retention rate	98%	97%	98%	96%	98%	98%	98%	97%	98%	97%
Predicted graduation rate	94%	94%	95%	96%	95%	93%	94%	93%	93%	93%
Actual graduation rate	97%	98%	96%	90%	94%	94%	94%	93%	94%	93%
Over/under performance	+3	+4	+1	-6	-1	+1	0	0	+1	0
Faculty resources rank	2	3	6	4	15	13	1	4	13	17
% of classes under 20	74%	69%	77%	67%	68%	70%	73%	71%	72%	64%
% of classes of 50 or more	10%	13%	8%	8%	11%	11%	8%	5%	8%	10%
Student/faculty ratio	5/1	7/1	6/1	3/1	8/1	6/1	6/1	8/1	7/1	8/1
% full-time faculty	91%	92%	89%	98%	90%	99%	87%	97%	91%	91%
Selectivity rank	4	1	2	4	2	8	8	11	6	11
SAT/ACT 25th-75th percentile	1380-1560	1400-1580	1400-1580	1470-1580	1430-1570	1360-1550	1340-1520	1360-1540	1340-1540	1350-1550
Freshmen in top 10% of HS class	94%	96%	95%	94%	97%	89%	94%	88%	92%	87%
Acceptance rate	11%	9%	10%	20%	14%	12%	21%	24%	13%	17%
Financial resources rank	13	8	2	1	5	8	7	12	16	10
Alumni giving rank	1	6	4	25	10	8	7	5	16	2
Average alumni giving rate	61%	44%	45%	30%	38%	39%	40%	44%	35%	50%

A description of the ranking process can be found at [http://colleges.usnews.rankingsandreviews.com/usnews/edu/college/rankings/about/weight\\_brief.php#spend](http://colleges.usnews.rankingsandreviews.com/usnews/edu/college/rankings/about/weight_brief.php#spend)  
**Acceptance rate.** The ratio of the number of students admitted to the number of applicants for the fall 2005 admission. The acceptance rate is equal to the total number of students admitted divided by the total number of applicants. Both the applications and acceptances only counted first-time, first-year students.

**Alumni giving.** The average percent of undergraduate alumni of record who donated money to the college or university. Alumni of record are former full- or part-time students that received an undergraduate degree and for whom the college or university has a current address. Graduates who earned only a graduate degree are excluded. Undergraduate alumni donors are alumni with undergraduate degrees from an institution that made one or more gifts for either current operations or capital expenses during the specified academic year. The alumni giving rate is calculated by dividing the number of appropriate donors during a given academic year by the number of appropriate alumni of record for that year. These rates were averaged for the 2004 and 2005 academic years. The percent of alumni giving serves as a proxy for how satisfied students are with the school.

**Average freshman retention rate.** The percentage of first-year freshmen who returned to the same college or university the following fall, averaged over the first-year classes entering between 2001 and 2004.

**Average graduation rate.** The percentage of freshmen who graduated within a six-year period, averaged over the classes entering between 1996 and 1999. (Note: This excludes students who transferred into the school.)

**Class size, 1-19 students.** The percentage of undergraduate classes, excluding class subsections, with fewer than 20 students enrolled during the fall of 2005.

**Class size, 50+ students.** The percentage of undergraduate classes, excluding class subsections, with 50 students or more enrolled during the fall of 2005.

**Expenditures per student.** Financial resources are measured by the average spending per full-time equivalent students on instruction, research, public service, academic support, student services, institutional support, and operations and maintenance (for public institutions only) during the 2004 and 2005 fiscal years. The number of full-time equivalent students is equal to the number of full-time students plus one-third of the number of part-time students. (Note: This includes both undergraduate and graduate students.) We first scaled the public service and research values by the percentage of full-time equivalent undergraduate students attending the school. Next, we added in total instruction, academic support, student services, institutional support, and operations and maintenance (for public institutions only) and then divided by the number of full-time equivalent students. After calculating this value, we applied a logarithmic transformation to the spending per full-time equivalent student, prior to standardizing the value. This calculation process was done for all schools.

**Faculty compensation.** The average faculty pay and benefits are adjusted for regional differences in cost of living. This includes full-time assistant, associate, and full professors. The values are taken for the 2004-2005 and 2005-2006 academic years and then averaged. (The regional differences in cost of living are taken from indexes from Runzheimer International.)

**Faculty with Ph.D.'s, or top terminal degree.** The percentage of full-time faculty members with a doctorate or the highest degree possible in their field or specialty during the 2005-2006 academic year.

**Graduation rate performance.** The difference between the actual six-year graduation rate for students entering in the fall of 1999 and the predicted graduation rate. The predicted graduation rate is based upon characteristics of the entering class, as well as characteristics of the institution. If a school's actual graduation rate is higher than the predicted rate, then the school is enhancing achievement.

**High school class standing.** The proportion of students enrolled for the fall 2005 academic year who graduated in the top 10 percent (for national universities and liberal arts colleges) or 25 percent (master's and comprehensive colleges) of their high school class.

**Peer Assessment.** How the school is regarded by administrators at peer institutions. A school's peer assessment score is determined by surveying the presidents, provosts, and deans of admissions (or equivalent positions) at institutions in the school's category. Each individual was asked to rate peer schools' undergraduate academic programs on a scale from 1 (marginal) to 5 (distinguished). Those individuals who did not know enough about a school to evaluate it fairly were asked to mark "don't know." A school's score is the average score of all the respondents who rated it. Responses of "don't know" counted neither for nor against a school. The survey was conducted in the spring of 2006, and about 58 percent of those surveyed responded.

**Proportion of full-time faculty.** The proportion of the 2005-2006 full-time equivalent faculty that is full time. The number of full-time equivalent faculty is equal to the number of full-time faculty plus one third of the number of part-time faculty. (Note: We do not include the following: faculty in preclinical and clinical medicine; administrative officers with titles such as dean of students, librarian, registrar, or coach, even though they may devote part of their time to classroom instruction and may have faculty status; undergraduate or graduate students who are teaching assistants or teaching fellows; faculty on leave without pay; or replacement faculty for those faculty members on sabbatical leave.) To calculate this percentage, the total full-time faculty is divided by the full-time equivalent faculty.

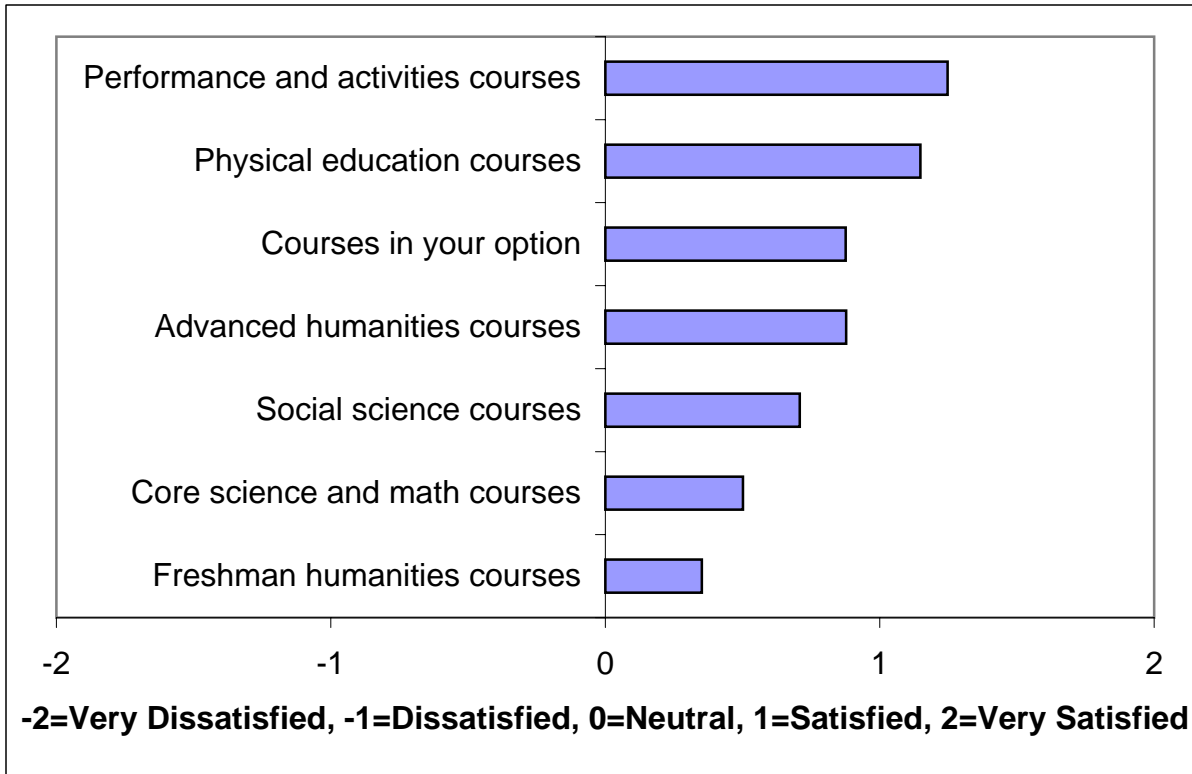
**SAT/ACT scores.** Average test scores on the SAT or ACT of all enrolled first-time, first-year students entering in 2005. Before being used as a ranking indicator, the scores are converted to the percentile of the national distribution corresponding to that school's scores.

**Student/faculty ratio.** The ratio of full-time-equivalent students to full-time-equivalent faculty during the fall of 2005, as reported by the school. Note: This excludes faculty and students of law, medical, business, and other stand-alone graduate or professional programs in which faculty teach virtually only graduate-level students. Faculty numbers also exclude graduate or undergraduate students who are teaching assistants.

**2008 US News and World Report Rankings**

	Princeton	Harvard	Yale	Stanford	Caltech	U Penn	MIT	Duke	Columbia
Rank	1	2	3	4	5	7	8	9	9
Overall score	100	99	98	95	94	94	92	90	90
Peer assessment score	4.9	4.9	4.8	4.9	4.7	4.5	4.4	4.6	4.6
Graduation and retention rank	2	1	3	5	20	7	9	9	9
Average freshman retention rate	98%	98%	98%	98%	97%	98%	97%	98%	98%
Predicted graduation rate	96%	94%	96%	93%	94%	95%	94%	92%	92%
Actual graduation rate	96%	98%	96%	95%	89%	94%	94%	94%	94%
Over/under performance	0	+4	0	+2	-5	-1	0	+2	+2
Faculty resources rank	3	3	9	13	2	1	3	10	10
% of classes under 20	72%	69%	76%	73%	75%	74%	68%	71%	71%
% of classes of 50 or more	10%	13%	8%	10%	8%	8%	11%	6%	9%
Student/faculty ratio	5/1	7/1	6/1	6/1	3/1	6/1	8/1	7/1	7/1
% full-time faculty	93%	92%	89%	100%	98%	86%	90%	97%	91%
Selectivity rank	3	1	1	7	7	7	12	5	5
SAT/ACT 25th-75th percentile	1370-1590	1390-1590	1390-1580	1340-1540	1470-1580	1330-1530	1430-1570	1350-1540	1330-1540
Freshmen in top 10% of HS class	94%	95%	95%	89%	88%	94%	97%	89%	93%
Acceptance rate	10%	9%	9%	11%	17%	18%	14%	23%	12%
Financial resources rank	12	8	2	10	1	8	5	14	16
Alumni giving rank	1	6	5	9	28	8	10	2	15
Average alumni giving rate	60%	41%	44%	38%	29%	39%	38%	52%	35%

Satisfaction with Courses

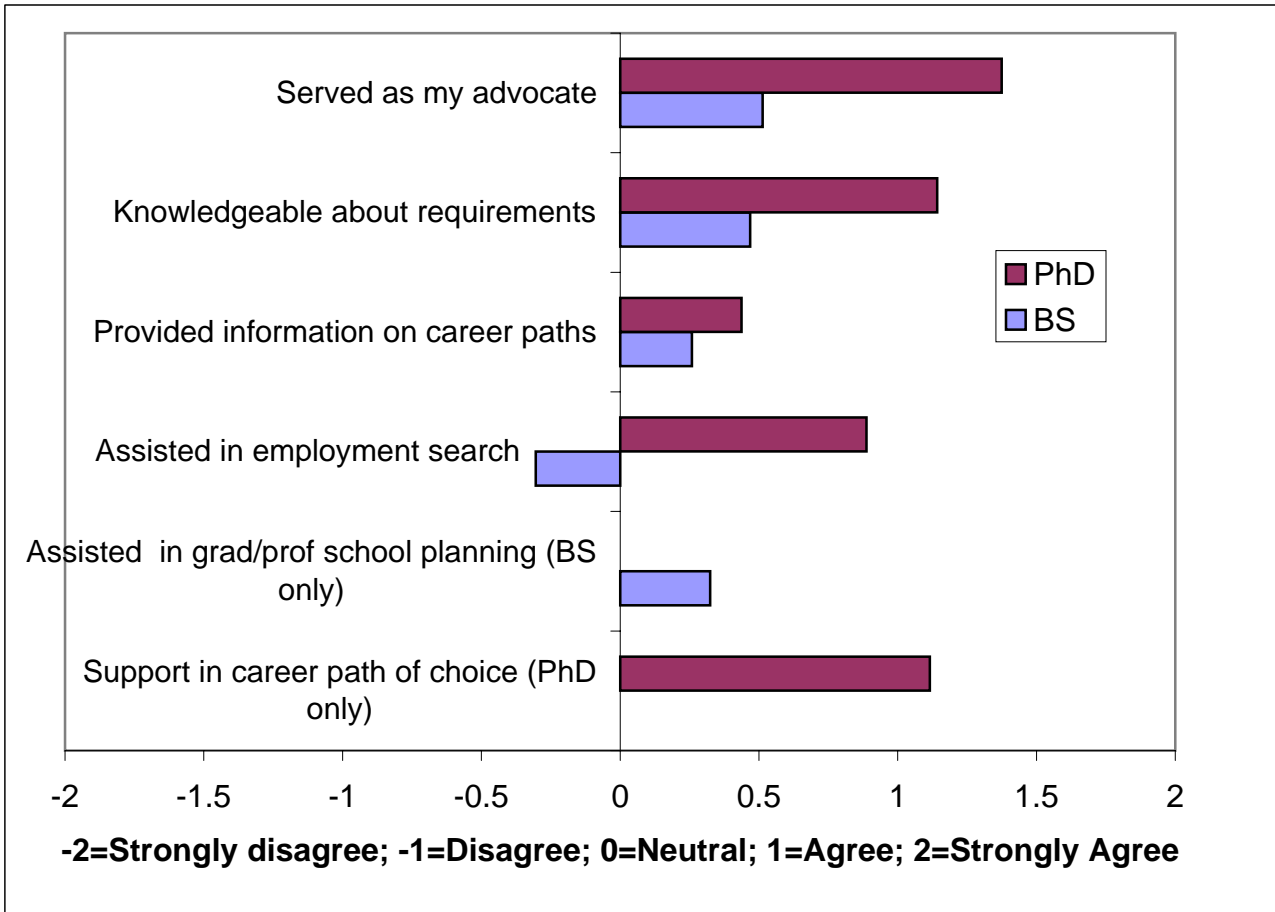


Courses in your option		Core science & math		Physical education		Performance & activities		Freshman humanities		Advanced humanities		Social science courses	
N	NA	N	NA	N	NA	N	NA	N	NA	N	NA	N	NA
348	1	348	9	348	3	345	135	348	4	348	5	348	6

2006 and 2007 satisfaction level of B.S. graduates regarding Caltech courses.

N=number of respondents; NA=number replying not applicable

Satisfaction with Advisors



	Knowledgeable about requirements		Provided information on career paths		Assisted in grad/prof school planning		Served as my advocate		Assisted in employment search		Support in career path of choice	
	N	NA	N	NA	N	NA	N	NA	N	NA	N	NA
Undergrad	0	0	0	0	0	0	0	0	0	0		
Grads	309	20	309	33			308	25	307	37	307	20

2006 and 2007 exit responses concerning academic (B.S.) and dissertation (PhD) advisors.  
 N = number of respondent; NA = number responding not applicable.

TQFR Data

winter 2005	units	hours per week			% of classes attended	% of homework completed	listed catalog units % of students saying		
		average	low	high			about right	low	high
Ph1b analytical	9	8.6	2	20	63	95	88	7	5
Ph1b practical	9	12.3	4	30	84	93	52	45	4
Ph2b	9	10.2	2	30	58	97	68	31	1
Ma 1b analytical	9	8.4	2	18	68	97	88	11	2
Ma 1b practical	9	8.7	2	15	44	97	91	8	1
Ma 1d	5	5.5	1	15	57	98	87	10	3
Ma2b analytical	9	7.7	3	15	49	98	95	3	2
Ma2b practical	9	10.2	4	20	57	99	89	10	2
Ch1b	9	8	1	24	62	98	91	7	2
Ch3a	6	7.4	4	12	99	95	75	25	0

spring 2005									
Ph1c analytical	9	9.1	2	18	60	98	85	14	1
Ph1c practical	9	11.3	3	23	76	98	58	39	3
Ma1c analytical	9	7.7	2	16	60	98	91	6	4
Ma1c practical	9	8.2	3	15	34	98	84	13	3
Ch3a	6	7.2	4	9	97	93	77	23	0
Bi 1	9	8.1	2	15	69	97	94	4	2
Ay 1	9	3.8	1	13	56	98	59	10	31

fall 2005									
Ph1a	9	7.4	2	15	60	99	87	1	12
Ph2a	9	9.6	3	28	63	98	81	15	3
Ma1a	9	no data available							
Ma2a analytical	9	9.1	1	18	65	97	81	16	3
Ma2a practical	9	8.8	3	20	47	98	88	9	3
Ch 1a	6	8	1	20	76	99	68	30	2
Ch 3	6	7.7	3	11	95	93	65	32	3

winter 2006									
Ph1b analytical	9	8.3	2	45	61	94	92	5	3
Ph1b practical	9	11.3	5	18	69	95	45	53	2
Ph2b	9	8.1	2	17	57	97	93	5	3
Ma1b analytical	9	7.9	2	13	64	98	87	10	3
Ma1b practical	9	7.9	3	17	43	98	87	10	3
Ma2b	9	8.6	1	20	55	97	92	1	7
Ch1b	9	7.6	2	20	61	99	86	13	1
Ch3a	6	7.9	3	15	98	94	51	49	0

spring 2006									
Ph1c analytical	9	9	1	17	49	98	83	16	1
Ph1c practical	9	12.1	6	20	72	98	29	71	0
Ma1c analytical	9	8.5	2	15	52	99	79	14	8
Ma1c practical	9	8.6	4	15	61	97	91	8	1
Ch3a	6	7.7	6	11	98	95	74	26	0
Bi 1	9	7.6	1	16	66	99	92	5	3
Ay 1	9	4.3	1	12	39	99	65	9	27
Ge 1	9	7.3	3	12	94	99	93	4	4

TQFR Data

fall 2006	units	hours per week			% of classes attended	% of homework completed	listed catalog units % of students saying		
		average	low	high			about right	low	high
Ph 1a	9	6.9	1	27	51	98	81	8	11
Ph 2a	9	9.1	3	18	60	99	94	6	0
Ma1a Sec 1	9	8.1	2	19	83	94	82	6	12
Ma1a	9	8.8	2	33	74	99	87	11	1
Ma 2a analytical	9	8.4	3	15	55	98	86	12	2
Ma 2a practical	9	10	3	20	53	98	74	26	0
Ch 1a	6	7.5	1	20	72	99	70	27	3
Ch 3a	6	8	2	16	98	97	65	32	4

winter 2007									
Ph1b analytical	9	7.6	2	22	52	98	92	3	5
Ph1b practical	9	12.7	5	44	86	98	49	51	0
Ph 2b	9	no data							
Ma 1b analytical	9	7.9	2	20	55	99	89	6	5
Ma 1b practical	9	7.8	2	20	37	98	87	10	3
Ma 2b	9	8.7	3	18	56	95	91	9	0
Ch 1b	9	7.3	1	36	48	99	84	10	7
Ch 3a	6	8.1	2	40	100	96	77	21	2

spring 2007									
Ph1c analytical	9	8.7	4	19	34	98	87	11	2
Ph1c practical	9	12.6	5	24	78	96	27	71	3
Ma 1c analytical	9	8.7	2	19	57	99	86	12	2
Ma 1b practical	9	8.8	4	18	64	95	91	9	0
Ch 3a	6	7	2	12	99	95	67	31	2
Bi 1	9	8.8	4	25	56	98	92	6	2
Ay 1	9	5.6	1	15	59	96	69	6	25
Ge 1	9	7.4	3	10	95	99	98	2	0



Graduation Statistics for 2003-2007

Option	B.S. graduates by year					Total 2003-2007			
	2003	2004	2005	2006	2007	M	F	M+F	% F
Physics	29	27	34	39	25	127	27	154	17.5
Biology	24	24	28	36	22	57	77	134	57.5
Electrical Engineering	23	21	24	26	17	85	26	111	23.4
Engineering & Applied Science	52	22	15	9	2	71	29	100	29.0
Mechanical Engineering	17	19	22	21	18	70	27	97	27.8
Chemistry	14	14	19	19	10	40	36	76	47.4
Mathematics	21	14	8	15	18	56	20	76	26.3
Computer Science	0	12	14	18	16	52	8	60	13.3
Electrical & Computer Engrg.	20	11	3	3	1	32	6	38	15.8
Chemical Engineering	5	3	6	15	8	19	18	37	48.6
Applied & Computational Math	7	7	3	8	6	25	6	31	19.4
Applied Physics	4	6	9	7	2	21	7	28	25.0
Economics	1	3	7	4	7	17	5	22	22.7
EAS/Aeronautics	5	6	6	3	1	16	5	21	23.8
Geology	5	4	4	4	3	6	14	20	70.0
Astronomy/Astrophysics	5	3	2	6	2	6	12	18	66.7
Business Economics & Management	0	4	4	4	2	12	2	14	14.3
Planetary Science	2	5	3	1	0	2	9	11	81.8
Geophysics	4	4	1	1	1	5	6	11	54.5
Geobiology	0	0	4	2	2	3	5	8	62.5
EAS/Computation and Neural Systems	0	0	0	2	4	4	2	6	33.3
Geochemistry	1	2	0	0	1	0	4	4	100.0
Materials Science	0	0	0	2	1	1	2	3	66.7
Independent Studies Program	2	0	0	0	0	2	0	2	0.0
SES/HPS	2	0	0	0	0	0	2	2	100.0
Social Science	1	0	1	0	0	1	1	2	50.0
History	0	1	0	0	1	1	1	2	50.0
Literature/English	0	0	0	0	1	1	0	1	0.0
EAS/Structural Mechanics	0	0	0	0	1	0	1	1	100.0
Total	244	212	217	245	172	732	358	1090	

Option	PhD Graduates by Year					Totals 2003-07			
	2003	2004	2005	2006	2007	M	F	M+F	% F
Chemistry	30	29	38	31	28	111	45	156	28.8
Physics	18	26	22	21	24	91	20	111	18.0
Electrical Engineering	14	15	13	16	23	70	11	81	13.6
Biology	5	10	15	14	13	36	21	57	36.8
Chemical Engineering	4	9	13	11	13	36	14	50	28.0
Aeronautics	7	10	10	5	7	32	7	39	17.9
Mechanical Engineer	7	6	7	8	11	31	8	39	20.5
Applied Physics	4	5	3	11	12	29	6	35	17.1
Biochemistry & Molecular Bioph	5	4	6	8	8	22	9	31	29.0
Materials Science	4	7	6	3	9	22	7	29	24.1
Comp & Neural Systems	1	1	7	7	13	20	9	29	31.0
Mathematics	3	8	8	7	2	24	4	28	14.3
Astrophysics/Astro	2	7	5	5	2	15	6	21	28.6
Applied & Computational Math	6	2	3	4	4	18	1	19	5.3
Control & Dynamical Systems	3	4	5	3	4	16	3	19	15.8
Social Science	6	2	2	2	7	8	11	19	57.9
Computer Science	3	3	3	3	2	12	2	14	14.3
Environ Science & Engine	2	1	3	3	5	4	10	14	71.4
Geophysics	2	3	2	4	2	6	7	13	53.8
Planetary Science	5	3	0	3	1	8	4	12	33.3
Applied Mechanics	0	4	1	3	3	8	3	11	27.3
Bioengineering	0	0	5	1	4	8	2	10	20.0
Civil Engineering	2	2	2	0	3	6	3	9	33.3
Geology	3	2	0	2	1	4	4	8	50.0
Geochemistry	1	0	2	2	2	3	4	7	57.1
Geobiology	0	0	1	0	2	1	2	3	66.7
Genetics	0	0	0	0	1	0	1	1	100.0
Total	137	163	182	177	206	641	224	865	25.9

## Enumeration of Recommendations

### 1. Commitment to Education

- a. Reaffirm culture of excellence by stating goals of Caltech's education enterprise, and how these goals are accomplished.
- b. The commitment to high-quality educational efforts should also be reflected in the processes used to evaluate, promote, and compensate faculty and instructors.
- c. Faculty should be involved with both undergraduate and graduate students.
- d. Reaffirmation should be public.
- e. Reaffirmation website should be made outlining educational mission, and be linkable to teacher honors and student websites.
- f. There should be a follow-up to review of the progress of the recommendations on an annual basis.

### 2. Provost's Office

- a. Provost's Office should organize option-level discussions, including the ARC, APC, GSC, WASC.
- b. Feedback needs to be elicited on the level of options; mechanisms to implement feedback may need development.
- c. Options or divisions should appoint individual to oversee feedback process.
- d. Provost's Office should develop a best-practices teaching and advising guide.
- e. Provost's Office should ensure quality of undergraduate program on a level higher than individual areas of study through CUE.
- f. Provost's Office should explore new monetary incentives for good teaching.
- g. Provost's Office should explore ways of funding course innovative that is unrestricted by division budgets.
- h. Institute should explore opportunities to fund ongoing educational experiences.
- i. Institute should not place undue burden on professors for securing funds associated with teaching.
- j. Provost's Office should educate faculty: providing workshops, recording, and critiquing courses, and giving sessions on best practices on teaching, advising, mentoring.
- k. Provost's Office should provide orientation for new faculty.
- l. Provost's Office should expand TQFR, make it faster and better. Faculty should encourage students to use it.
- m. Provost's Office should filter TQFR for decency.

- n. Provost's Office should review exit surveys and forward academic portions to divisions/options.
- o. Provost's Office should work with ARC to implement SFP suggestions.
- p. Provost's Office should work with CPET.
- q. Provost's Office should ensure that teaching and advising is uniformly a component of tenure.
- r. 3-year visiting committee reviews of divisions should always include teaching.
- s. WASC reaccreditation activities should be part of an ongoing and continuous evaluation process.
- t. Provost's Office develop an assessment process for academic programs, starting with pilot programs in a UG and G program and possibly moving on to others depending on its success.

### 3. Core curriculum

- a. Officers of the Faculty should form an ad hoc committee to revisit Core.
- b. This committee should articulate purpose, goals, outcomes, assessment of Core.
- c. It should seek ways to expand flexibility to enable long-term research relationships and fulfill option requirements.
- d. It should explore additional mechanisms that facilitate direct student-faculty interactions: research tutorials frontiers courses.
- e. It should examine differential HS preparation and ways students are introduced to the Core.
- f. It should reexamine the P-F grading system.

### 4. Relieve academic stress

- a. CUE and OoF should seek ways to review overloading and correct it.
- b. Faculty should encourage a self-reporting of work hours.
- c. Faculty should read the TQFR results.
- d. Faculty should actively look for ways to bring students back to the classroom.
- e. Faculty need to establish regular office hours and encourage students to come: individual appointments with students, office hours as a class requirement, etc
- f. UG tutors need training.
- g. Tutoring services need advertisement.
- h. Hixon tutors should visit Frosh Hums to offer their services.
- i. Dean's office should look into improving study skills of students.

- j. Instructors should encourage discussion by possibly making a requirement as part of a grade
- k. Continue support of PA and PE classes.

5. Graduation Rates

- a. Dean's Office and Graduate Studies office develop mechanisms to tabulate and understand why students leave Caltech without their degree goal.
- b. Dean's office should do a systematic study of underloads, leaves of absences, E, I and W grades and medical excuses.
- c. GSO should also look at GS leave policies.
- d. This retention information should be shared with admissions.

6. Faculty in Student Affairs

- a. Vice President of Student Affairs is a faculty member.
- b. The responsibilities of the VPSA should be clearly defined.
- c. These faculty positions associated with Student Affairs should be attractive so that faculty can be recruited to these positions.
- d. Chairs of important committees should be given good incentives to take and hold these chairs.
- e. Faculty must continue to find ways to work in partnership with SA.
- f. The VPSA should clearly articulate the roles of SA to faculty.

7. Office of Graduate Studies

- a. Dean of Graduate Studies should work with VPSA to clarify role of the Office.
- b. OGS should strengthen its ability to support individual graduate students and act as a resource center for students.
- c. Relationships between DGS, Division chairs, Provost, should be clarified and strengthened.
- d. The role of the Assistant Dean should be clarified and advertised.
- e. OGS should actively recruit minority graduate students.
- f. OGS should sponsor a review honor system for graduate students.
- g. OGS should strengthen ties with the GSC.

8. Residential Life Program

- a. A position of Dean of Residence Life should be created, reporting through the deans (w/many qualifications).
- b. Review of RA program be undertaken to ensure that expectations and responsibilities for RAs are consistent with their training, compatible with

their work, and reflect their academic talents; these expectations should be clearly communicated.

- c. The RAs should not fulfill duties of the Housing office.
- d. RA compensation should be reviewed by Dean's Office and General Counsel's Office.
- e. Dean's Office should ensure student input throughout the RA selection process.
- f. Upper Class Counselor program should be a part of every House.
- g. The Health Advocate Program should be integrated into larger safety net.
- h. The DRL should participate in ASCIT and IHC meetings.
- i. DRL would also interface with Dean's tutoring program.
- j. There should be a process to understand why students leave the Houses.
- k. Housing revenues should continue to support the residential life programs.
- l. SA should review process by which funds are used to support activities on campus, appointing students to have input in funded activities.
- m. MOSH should continue with existing responsibilities outlined in 2002 report.
- n. The conditions of the student Houses and graduate residential life facilities should be monitored.

#### 9. Diversity

- a. Caltech should ensure that the policies and practices of the Institute are consistent with the goal of achieving greater diversity.
- b. Procedures and practices for search and promotion should be consistent with Caltech policy and federal law.
- c. Review charge to ACODAMA and overall review of diversity programs.

#### 10. Board of Trustees

- a. A Trustee committee on student experience should be encouraged.
- b. The Trustee committee should have two Advisory Members who are students.
- c. This committee can be involved in ongoing program assessment.
- d. The MOSH can help to facilitate social and academic interactions.