# Chapter 4C: Balancing Student/Faculty Ratios

## Starting Points

College of Engineering enrollments and research expenditures have increased significantly over the last decade (Figure 4.4, reproduced below), while the number of tenured and tenure-track faculty have declined (Figure 4.11, reproduced page 4-18). This has resulted in an increase in COE student/faculty ratios. Average COE undergraduate student/faculty ratios increased from 12.1/1 to 15.1/1 and graduate student/faculty ratios increased from 4.6/1 to 5.9/1 since 1995 (Table 4C.1). If we consider that the Department of Atmospheric Science does not have a graduate program, then college-wide undergraduate student faculty ratios currently are 18.0/1.

CSU's strategic plan cites University-wide target student/faculty ratios of 20.0/1 (undergraduate) and 3.8/1 (graduate). Given that the College of Engineering excels in research (with strong graduate programs and average expenditures exceeding $500K/faculty-year), the College's target student/faculty ratios are 15.0/1 (undergraduate) and 6.5/1 (graduate). As Colorado State University rebuilds its faculty, there is an opportunity to invest in the College of Engineering. This will allow us to continue to improve and build undergraduate and graduate academic programs while maintaining strong research and scholarship.

**Figure 4.4. Historical College of Engineering Enrollments**

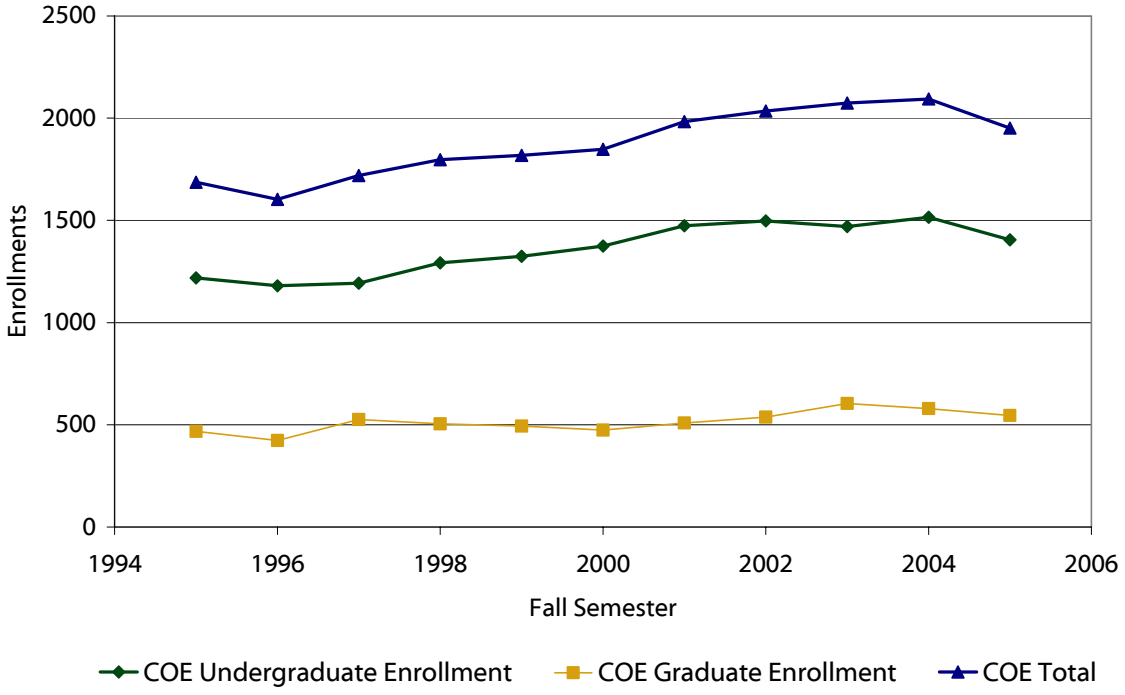
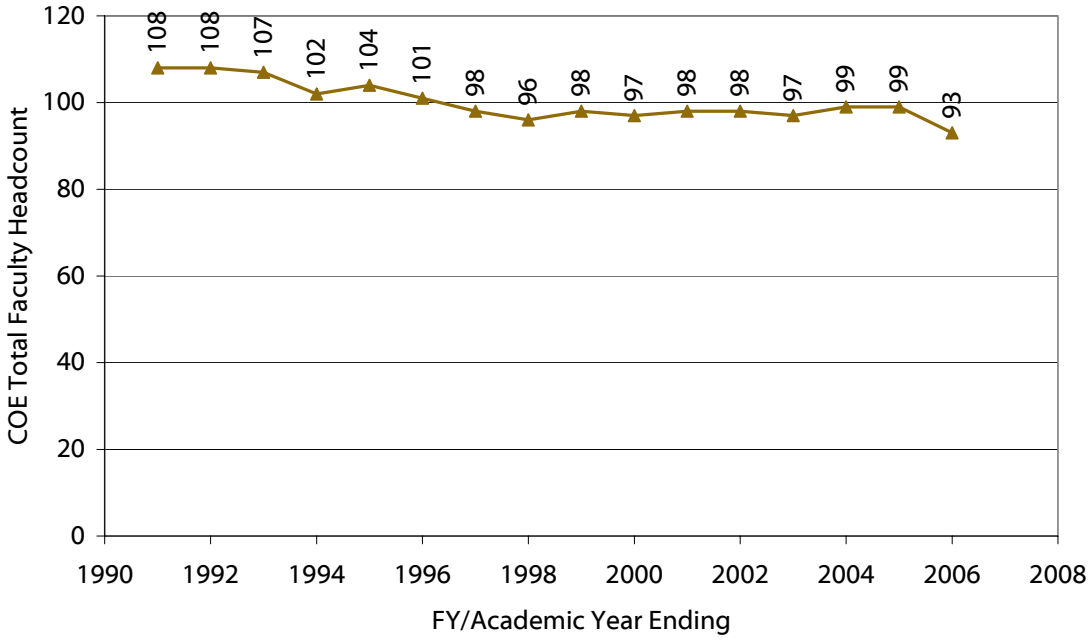


**Figure 4.11 COE Faculty Headcount**




## Table 4C.1 Student/Faculty Ratios in the College of Engineering

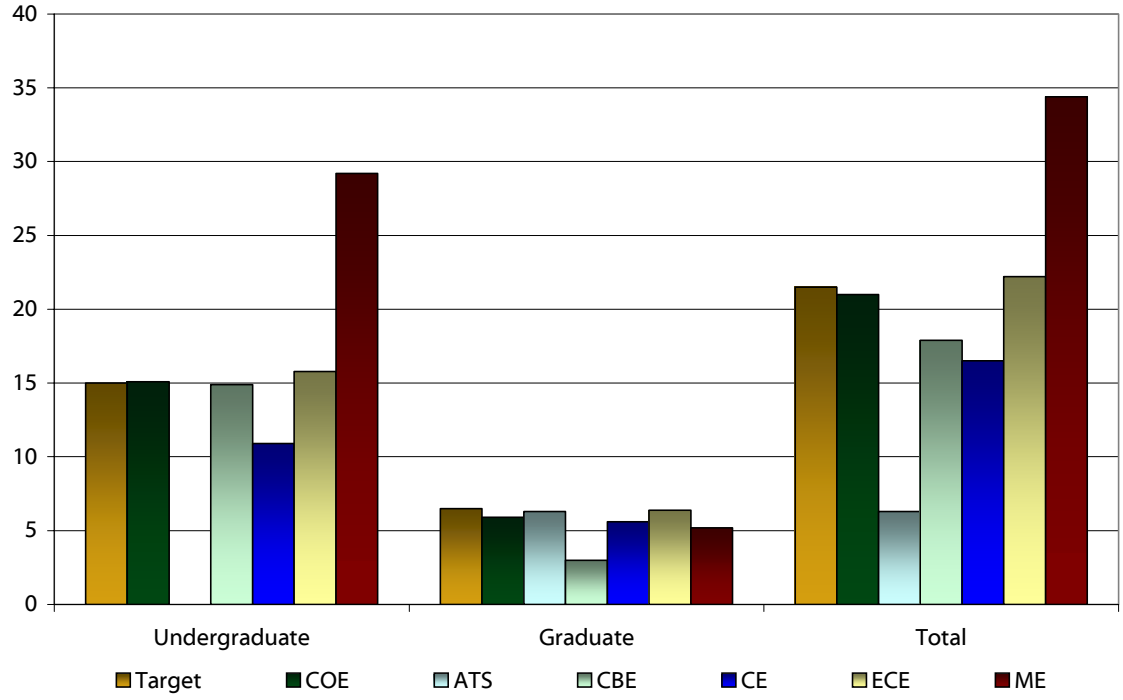
| | Faculty | Enrollments | | | Student/Faculty Ratios | | |
|---|---|---|---|---|---|---|---|
| **Units** | **Head-count** | **Under-Graduate** | **Graduate** | **Total** | **Under-Graduate** | **Graduate** | **Total** |
| **Data for 1995/1996 Academic Year** | | | | | | | |
| **COE** | **101** | **1,219** | **468** | **1,687** | **12.1/1** | **4.6/1** | **16.7/1** |
| Atmospheric Science | 14 | 0 | 87 | 87 | 0.0/1 | 6.2/1 | 6.2/1 |
| Chemical and Bioresource Engineering[1] | 18 | 188 | 47 | 235 | 10.4/1 | 2.6/1 | 13.1/1 |
| Civil Engineering | 28 | 361 | 180 | 541 | 12.9/1 | 6.4/1 | 19.3/1 |
| Electrical and Computer Engineering | 19 | 242 | 73 | 315 | 12.7/1 | 3.8/1 | 16.6/1 |
| Mechanical Engineering | 21 | 347 | 81 | 428 | 16.5/1 | 3.9/1 | 20.4/1 |
| **Data for 2005/2006 Academic Year** | | | | | | | |
| **COE** | **93** | **1,405** | **546** | **1,951** | **15.1/1** | **5.9/1** | **21.0/1** |
| **COE w/out ATS Faculty** | **78** | **1,405** | | | **18.0/1** | | |
| Atmospheric Science | 15 | 0 | 94 | 94 | 0.0/1 | 6.3/1 | 6.3/1 |
| Chemical and Biological Engineering | 7 | 104 | 21 | 125 | 14.9/1 | 3.0/1 | 17.9/1 |
| Civil Engineering | 35 | 381 | 195 | 576 | 10.9/1 | 5.6/1 | 16.5/1 |
| Electrical and Computer Engineering | 18 | 284 | 115 | 399 | 15.8/1 | 6.4/1 | 22.2/1 |
| Mechanical Engineering | 18 | 526 | 94 | 620 | 29.2/1 | 5.2/1 | 34.4/1 |

[1] Seven bioresource engineering faculty merged with the Department of Civil Engineering faculty in 2000.

College of Engineering's enrollments and degree production are consistent with strong colleges of engineering throughout the United States (Comparator Analysis, Chapter 2). At the undergraduate level, our degree production per faculty (neglecting ATS faculty headcount) exceeds the average of institutions ranked in the top 30. At the graduate level, our degree production per faculty is consistent with institutions ranked 41-60 (Table 2.2; page 2-3). Therefore, as we build faculty, it will be important to build enrollments, especially at the graduate level.

Clearly, however, enrollments are not consistent across departments (Table 4C.1 and Figure 4C.1). The Department of Atmospheric Science offers only graduate degrees; the Department of Civil Engineering has a high service teaching load[2] and generates about one third of the COE's student credit hour production; and undergraduate student/faculty ratios in the Department of Mechanical Engineering are nearly double our target. It will be important to balance student/faculty ratios over the next few years by increasing the number of faculty in the College of Engineering. This will allow us to provide excellent undergraduate programs, while maintaining strong research and graduate programs.

**Figure 4C.1 2005 Student/Faculty Ratios in the College of Engineering**




Our short-term goal is to reach a faculty headcount of 114. The College of Engineering intends to be very aggressive in seeking development funds and new faculty lines to reach this goal by 2010. Our long-term goal is to reach 160 faculty, the average faculty headcount within the top 80 colleges of engineering (Chapter 2). Given these faculty numbers, we would expect the following:

[2] The Department of Civil Engineering offers multiple classes in support of the Construction Management Program and delivers many of the College of Engineering's basic mechanics classes.

**Table 4C.2 College of Engineering Targets**

| | Current Statistics - Basis | Current Statistics | Short-Term Goal | Long-Term Goal |
|---|---|---|---|---|
| Undergraduate Student/Faculty Ratio | FA'05<br>FA'05 | 15.1/1<br>18.0/1[3] | 15.0/1 | 15.0/1 |
| Graduate Student/Faculty Ratio | FA'05 | 5.9/1 | 6.1/1 | 6.5/1 |
| B.S. Degrees/Year-Faculty | FY'05 | 3.3 | 3.0-3.3 | 3.0-3.3 |
| M.S. Degrees/Year-Faculty | FY'05 | 1.3 | 1.3-1.6 | 1.6-1.9 |
| Ph.D. Degrees/Year-Faculty | FY'05 | 0.33 | 0.40 | 0.50 |
| Tenured and Tenure-Track Faculty Headcount | FA'05 | 93 | 114 | 160 |
| Undergraduate Enrollments | FA'05 | 1,405 | 1,710 | 2,400 |
| Graduate Enrollments | FA'05 | 546 | 695 | 1,040 |
| Research Expenditures/Year[4] | FY'05 | $50.4M | $57.0M | $80.0M |

**Objective:** **Improve student/faculty ratios in all departments by growing the base number of faculty.**

**Goal:** Add faculty to balance teaching and research loads across the College of Engineering. This should result in stronger research programs, an overall undergraduate student/faculty ratio of 15.0/1, and a graduate student to faculty ratio of 6.5/1.

**Strategies:**

- The College of Engineering will add new faculty positions through differential tuition funds and new CSU faculty lines to reach a short-term goal of 114 tenured and tenure-track faculty in the College of Engineering. This is an increase of 21 faculty members from our current headcount of 93 (FA'05). At 114 faculty, the College of Engineering will be similar in size to engineering colleges that are ranked 41 to 50 (Comparator Analysis, Table 2.1, page 2-3).
- Our ultimate goal is to continue to build academic and research programs to support 160 tenured and tenure-track faculty; the average faculty headcount among the top 80 colleges of engineering in the United States. This will result in a College of Engineering that is similar to those currently ranked in the top 30.
- As the College of Engineering adds new faculty, increasing our faculty diversity will be an important consideration (Chapter 8).
- The College will continue to expand and improve development efforts to raise funds for professorships and chairs. This will allow the College of Engineering to leverage

[3] This is the ratio of undergraduate enrollments to the faculty headcount in the Departments of Chemical and Biological Engineering, Civil Engineering, Mechanical Engineering, and Electrical and Computer Engineering.
[4] This research productivity reflects the hire of strong tenured and tenure-track faculty who will develop research groups including non-tenure track research faculty (i.e. the ATS and CIRA model).

university resources to add faculty members more quickly and to reach our long-term goal of 160 tenured and tenure-track faculty members.

- The College will balance student faculty ratios by:
  - Reallocating positions among departments,[5]
  - Developing inclusive recruiting and retention strategies (Chapters 4A, 4B, and 4E) for our undergraduate and graduate programs to increase enrollments, where appropriate, and
  - Developing strategies to balance undergraduate student/faculty ratios in the Department of Mechanical Engineering. This may be accomplished by limiting undergraduate enrollments, adding faculty, and/or adding resources for instructors and GTAs.

**Metrics:**

- Undergraduate student/faculty ratios (target 15.0/1),
- Graduate student/faculty ratios (target 6.5/1), and
- Faculty headcount (short-term target: 114; long-term target: 160).

[5] Several positions have been reallocated among engineering departments to partially balance student/faculty ratios.