

# **Program Improvement Report Bachelor of Science in Civil Engineering**

**2005-2006**

*Department of Civil Engineering  
College of Engineering, Computer Science, and Construction Management  
California State University, Chico*



Compiled by  
Russell S. Mills, Ph.D., P.E.  
Professor  
Department of Civil Engineering

Approved by the Faculty  
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Editor's Note: This document provides a summary of findings and actions resulting from implementation of the Civil Engineering *Program Improvement Plan (PIP)* in effect at the time of this report. The applicable *PIP* is described in the companion document:

*Program Improvement Plan, B. S. in Civil Engineering, First Edition, August 2005.*

Minor deviations from this *PIP* are summarized below. Since in any semester there may be slight changes to the metrics used for direct and embedded assessment in individual courses, these are not called out in the list.

Minor Modifications to the *PIP* Reflected in this *Program Improvement Report (PIR)*:

<u>Period</u>	<u>Modifications</u>
2005-2006	Use of new major-specific (CE) graduating senior exit survey instrument.
2005-2006	Addition of five supplemental questions to the college graduating senior exit survey instrument.

**Program Improvement Report\***  
**Bachelor of Science in Civil Engineering**  
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\* Reference: *Program Improvement Plan*, Bachelor of Science in Civil Engineering, First Edition, August 2005.

## Introduction

The various means and processes regularly used to assess the effectiveness of the Civil Engineering program and its students are fully described in the companion document, *Program Improvement Plan*, Bachelor of Science in Civil Engineering, First Edition, August 2005. Based on implementation of this *PIP*, this *Program Improvement Report* provides a summary of findings and actions during the 2005-2006 academic year.

Since certain assessment measures may not have been employed during the period addressed by this *PIR*, some sections may not contain any findings. Refer to the *PIP* to ascertain the status of any inactive assessment measure and the intended date when it will next be utilized.

The *PIR* presents only summaries and selected data deemed valuable to program assessment. The complete data sets are available in the Civil Engineering department office, in a binder entitled *Program and Student Assessment*. Sections that are shaded in the accompanying tables are from periods prior to the focus of this *PIR*. Consequently, although these data provide historical perspective, they are not the emphasis of this report.

Section I of this report, *Assessment Summaries and Observations*, presents findings and observations based on application of the *PIP*, but provides no suggestions for possible reactions to the findings. Possible reactions will instead be found in Section II *Actions Planned as a Result of Assessment*, where various actions are discussed, generally without specific reference to the assessment finding that suggested the action. This reflects the complex synergy between assessment and improvement – for instance, a planned action may be in response to multiple assessment measures.

## I. Assessment Summaries and Observations

### 1. Direct and Embedded Assessment (*PIP Sections I.1 through I.4*)

The CE program's direct and embedded assessment plan, which uses specific assignments in selected courses to measure students' achievement of program learning outcomes, has now been active for five consecutive semesters. The results from the first three semesters of application (spring 2004, fall 2004, and spring 2005) can be found in the most previous edition of the *PIR* (dated September 23, 2005).

**TABLE I.1.1 DIRECT PROGRAM ASSESSMENT  
STUDENTS DEMONSTRATING OUTCOME ACHIEVEMENT**

CE Program Learning Outcome	Course Used for Outcome Assessment	Prior Semesters			Current Semesters	
		S04	F04	S05	F05	S06
a: ability to apply knowledge of mathematics, science, and engineering	CIVL 311 Strength of Materials	76%	90%	76%	91%	85%
b: ability to design and conduct experiments, as well as to analyze and interpret data	CIVL 411 Soil Mechanics & Foundations	100%	-	97%	-	96%
	CIVL 415 Reinforced Concrete Design	-	30%	-	91%	-
	CIVL 441 Transportation Engineering	-	100%	-	97%	-
c: ability to design a system, component or process to meet desired needs	CIVL 415 Reinforced Concrete Design	-	100%	-	91%	-
	CIVL 431 Environmental Engineering	100%	-	98%	-	98%
d: ability to function on multi-disciplinary teams	CIVL 431 Environmental Engineering	97%	-	100%		100%
	CIVL 495 Lifelong Development for Engineers	100%	100%	98%	100%	100%
e: ability to identify, formulate, and solve engineering problems	CIVL 415 Reinforced Concrete Design	-	100%	-	94%	-
	CIVL 441 Transportation Engineering	-	100%	-	97%	-
f: understanding of professional and ethical responsibility	CIVL 402 Contracts, Specifications and Technical Reports	95%	100%	100%	95%	93%
	CIVL 495 Lifelong Development for Engineers	100%	100%	100%	94%	100%
g: ability to communicate effectively	CIVL 402 Contracts, Specifications and Technical Reports	100%	100%	100%	100%	96%
	CIVL 415 Reinforced Concrete Design	-	100%	-	100%	-
h: broad education necessary to understand impact of engineering solutions in a global and societal context	CIVL 441 Transportation Engineering	-	100%	-	97%	-
	CIVL 495 Lifelong Development for Engineers	100%	93%	100%	96%	100%
i: recognition of the need for, and an ability to, engage in lifelong learning	CIVL 495 Lifelong Development for Engineers	100%	100%	100%	96%	100%
j: knowledge of contemporary issues	CIVL 495 Lifelong Development for Engineers	100%	100%	100%	96%	100%
k: ability to use techniques, skills, and modern engineering tools for engineering practice	CIVL 131 Introduction to Civil Engineering Design	98%	-	98%	-	99%
	CIVL 415 Reinforced Concrete Design	-	90%	-	82%	-

Summary data from fall 2005 and spring 2006 are presented in Table I.1.1 as the percentage of students who successfully demonstrated achievement of the specified outcome in the designated course. Only certain courses are used for this assessment. Since some courses are taught only once each academic year, these courses will not display results in off-semesters.

Student achievement rates generally fall above 90%, indicating that the program is successfully providing students with the knowledge, skills, and attitudes identified by the program. There are two exceptions, however: for outcome *a: ability to apply knowledge of mathematics, science, and engineering* as measured in CIVL 311 the success rate was 85% during Spring 2005; and for outcome *k: ability to use techniques, skills, and modern engineering tools for engineering practice* as measured in CIVL 415 during Fall 2005 student success was 82%.

In the case of CIVL 311 and outcome “a” there are likely two factors at play. One is that this is a pivotal course for CE majors, since they are expected to begin applying their understanding of mathematics and science to increasingly more advanced topics in engineering. As a consequence, students with less aptitude and/or deficient preparation in prerequisite courses will be at increased risk of failure. A second factor is that many of these students may, in fact, have not received an adequate exposure to fundamental topics in mathematics, science, and engineering needed to succeed in this course. This factor is a complex one and difficult to address, since the associated classes are largely outside the direct control of the CE department and, in the case of transfer students, would not even have been based at this university. Nevertheless, student performance on this metric has improved significantly when compared to the past three semesters.

On the other hand, variable results have occurred intermittently in assessment measures from CIVL 415, largely because of an increased use of temporary instructors in this course. While designated permanent faculty members provide oversight for courses when new instructors are hired, course components may suffer due to the inexperience of the new instructor. Consequently, the deficient student performance on outcome “k” was, in this case, likely the result of a deficient assessment metric rather than a high number of under-achieving students. Student performance in CIVL 131 on this same outcome shows high student achievement, which further suggests that this is not a programmatic shortcoming.

## 2. Fundamentals of Engineering Examination (PIP Section I.5)

Question 13 on the Graduating Senior Exit Survey solicits from students their success on the Fundamentals of Engineering Examination. The results from all four years shown in Table I.2.1 demonstrate that nearly 100% of those surveyed who had also received test results passed the examination – only one student reported failing the FE exam. This is not to claim that all students passed the exam in their first attempt or, since not all students had received their scores by the time the survey was distributed, even that they had all passed. Nevertheless, the results strongly suggest adequate student preparation in the fundamentals of civil engineering, a central mission of the program.

These results should also be viewed only as a sample, since not all students returned the survey. Instead, the return rate varies greatly from year to year (see Table I.3.3).

TABLE I.2.1 STUDENT PERFORMANCE ON THE F. E. EXAMINATION

Q13. Took a comprehensive exam

Year	No	Yes, and passed	Yes, and didn't pass	Yes, waiting for results	Total
02-03	0%	83%	0%	17%	100%
03-04	0%	55%	0%	45%	100%
04-05	0%	83%	0%	17%	100%
05-06	0%	65%	5%	30%	100%
	0	13	1	6	20

### 3. Graduating Senior Exit Survey (*PIP Section I.6*)

Summary data resulting from administration of the exit survey are presented in Appendix A. Table A.1 provides general response data regarding student demographics and student satisfaction with non-academic aspects of their experiences at CSU, Chico. On the other hand, Table A.2 addresses student satisfaction with their education and self-evaluation of their preparation in program learning outcomes. (These data sets are generated for all programs in the College of Engineering, Computer Science, and Construction Management, and are tabulated annually in the college document, *Assessment Report – Senior Exit Survey Result, Summary Report and Evaluation*).

Data resulting from use of the College’s new supplemental survey form are provided in Table A.3. Very few CE majors returned this survey, possibly due to a distribution problem. Consequently, the results should be interpreted with caution. For comparative purposes, college-wide response values are also provided.

Summary data resulting from the CE-specific survey (i.e., questions asked only of CE majors) are summarized in Table A.4. Collection of these responses commenced during the 2004-2005 academic year when the department implemented a comprehensive revision of the survey instrument. Data resulting from use of the previous instrument are not presented in the history since they are not readily comparable to the data obtained with the new instrument.

The department faculty made a number of noteworthy observations and conclusions based on these data. These are summarized in Table I.3.1.

Of particular significance is the students’ perception that they are prepared in the specified program outcomes. This corroborates similar findings from direct assessment measures, as summarized in Section 1.

Although most respondents agreed with the statement that they would recommend the civil engineering program to others, there was a significant decline in this response compared to

previous years. Judging from associated written comments, this drop may largely be due to the increased use of temporary instructors in the program and the unexpected loss of a popular tenured faculty member during the fall 2005 semester (Table I.3.2).

TABLE I.3.1 OBSERVATIONS BASED ON RESPONSES TO THE SENIOR EXIT SURVEY

- Students generally report adequate preparation in the full range of significant learning outcomes.
- Students were generally satisfied with the quality of teaching and access to faculty in the CE department; these measures improved over the past year.
- Students were generally dissatisfied with the availability of CIVL courses and the quality of laboratory and computer facilities.
- Students would like a broader variety and selection of courses related to the CE program.
- Students did not report high satisfaction with GE courses, although there is increased satisfaction over the past year.
- There has been, over the past several years, a gradual increase in the overall GPA as reported by students (e.g., in 2002-2003, 35% reported a GPA over 3.00; in 2005-2006, 60% did so).
- All CE students reported meeting with their major academic advisor at least once each year (although this is from a very small sample). CE student satisfaction with major academic advising has gradually increased over the past three years (this from a larger sample).
- CE students are not generally satisfied with advising from the university Advising Office, but few students report seeking advising from this resource.
- Most students experienced an internship or other relevant work experience prior to graduation and all who did so found the experience valuable.
- Most students had experienced involvement in student societies and all who participated found value in the experience.
- Most students did not use the career office; but for all who did it was helpful (this is a change over previous years).
- Most students found the EIT review sessions helpful.
- Students come to Chico State for the reputation of the engineering program, the geographical areas, and/or for reasonable cost.

The department will begin to gradually reduce its dependence on temporary instructors, as a new tenure-track faculty member in the transportation/traffic area was hired for fall 2006, and two additional tenure-track faculty members (in structures and in water resources/fluids) will arrive spring 2007. Also, over the next one to two years the faculty will lose both FERP instructors, which will likely serve as justification for one or more additional probationary hires. New hires are essential in light of the continued growth in the number of CE majors (approximately 10% each year over the past four years).



TABLE I.3.2 INSTRUCTOR DISTRIBUTION

Instructor Classification	Fall 2005	Spring 2006
Tenured & Tenure-Track	5 <sup>a</sup>	3 <sup>b</sup>
FERP	2	2
Temporary	6 <sup>c</sup>	8 <sup>d</sup>
Total	13	13

a. Includes one ME faculty member on temporary assignment.

b. Includes loss of one CE faculty member on indefinite leave.

c. Includes two instructors hired mid-semester as emergency replacements.

d. Includes one student lab assistant.

The number of students who successfully completed all requirements for the Bachelor of Science in Civil Engineering is tabulated by academic year in Table I.3.3. During these same years, the return rate on the Graduating Senior Exit Survey has varied from 41 to 65 percent of those who graduated.

TABLE I.3.3 BSCE GRADUATES BY YEAR AND SURVEYS RETURNED

Academic Year	BSCE Graduates	Surveys Returned	
2001-2002	27	12	44%
2002-2003	26	17	65%
2003-2004	38	20	53%
2004-2005	29	12	41%
2005-2006	35	20	57%

#### 4. Alumni Survey (*PIP Section II.2*)

*This assessment measure was not used during the period addressed by this report.*

#### 5. Employer Survey (*PIP Section II.3*)

*This assessment measure was not used during the period addressed by this report.*

#### 6. Professional Advisory Board Feedback (*PIP Section II.4*)

The agenda for the CE Professional Advisory Board (PAB) meeting of October 28, 2005, included an introduction to the first editions of the CE program's PIP (dated August 2005) and PIR (approved by the faculty on September 23, 2005). At this meeting, the PAB was asked to review, respond, and make recommendations to the following items related to the mission of the CE program:

- CE Program Improvement Plan and Report (PIP and PIR)
- CE educational objectives
- CE-specific senior exit survey
- CE alumni and employer surveys

At its spring meeting of April 7, 2006, the PAB discussed these topics thoroughly, resulting in the following responses.

***CE Program Improvement Plan and Report:*** The PAB commended the department and Professor Mills for creating these assessment materials in response to recently implemented accreditation requirements. Otherwise, no specific recommendations were provided relative to these documents.

***CE Educational Objectives:*** The PAB provided recommended modifications to the program educational objectives, including inclusion of one new objective associated with ABET Engineering Criteria 2000 Criterion 3.

The entire text of the current statement for the CE program's goals and objectives is shown in Figure I.6.1, marked with strikeout and underlining showing the changes recommended by the PAB.

<p>The civil engineering program has two comprehensive goals: to prepare graduates for immediate entry into a variety of professional careers and to provide a solid undergraduate foundation in general principles enabling continued education at advanced levels.</p> <p>In support of these goals, the program is constructed to provide graduates with a broad-based education as effective problem-solvers and designers in a variety of sub-disciplines within civil engineering. Specific objectives of the program are to:</p> <ul style="list-style-type: none"><li>• supply a rigorous, balanced, comprehensive and contemporary curriculum enabling exposure to many facets of civil engineering, <del>including both breadth and selected depth elements common to the profession.</del></li><li>• provide an extensive education in mathematics, sciences and engineering <del>topics, including design.</del></li><li>• <u>provide the foundation to design and analyze a system, component, or process, including the opportunity to effectively function on multidisciplinary teams.</u></li><li>• provide an <del>effective</del> general education experience in the humanities and social sciences.</li><li>• develop valuable personal abilities in oral and written communication, critical thinking, leadership and teamwork.</li><li>• enable appropriate use of technology, including computational tools.</li><li>• familiarize graduates with applicable regulatory issues.</li><li>• instill <del>in graduates</del> a sense of coherence, respectfulness, citizenship, community service, and ethical responsibility.</li><li>• provide opportunities for extracurricular learning, professional experiences, and fellowship through activities sponsored by campus-affiliated chapters of national professional and honor societies.</li></ul>
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Figure I.6.1: PAB recommended modifications to the CE program educational objectives.

***CE-Specific Senior Exit Survey:*** The PAB reported general satisfaction with the form and content of this instrument.

***CE Alumni and Employer Surveys:*** The PAB chose to provide recommendations related to the alumni survey instrument, but chose not to respond to the request for information regarding the employer survey instrument until a subsequent meeting.

Specifically, PAB suggests that the following information would be important to include in a redesign of the CE alumni survey instrument:

- Year of graduation and description of additional post-baccalaureate education, if applicable.
- Principle area(s) of practice. (Editor's Note: The prompt should provide for alumni who pursue careers outside of engineering).
- Employment history, including type (private, federal, state, county) and duration.
- Professional registration(s) obtained (type and year), including EIT. Was the EIT completed before or after graduation?
- Adequacy and suitability of their education from CSU, Chico.
- Suggestions for CE program modifications, including changes to the course requirements and options.
- Evaluate development of an on-line survey device.

In the near future, PAB should be asked to complete its evaluation of two additional items – these items were presented to the PAB at the fall 2005 meeting:

- *New Course Review:* PAB is currently evaluating a new course being developed as a required, freshman-level course, CIVL 110 *Graphics for Civil Engineers*. This course was taught for the first time fall 2005.
- *CE Employer Survey Instrument:* As a first step in development of a new survey instrument, PAB is compiling a list of information the board feels would be useful to obtain from employers in support of program assessment. *It is essential that this survey, and the alumni survey, be developed, administered, and evaluated prior to the next ABET accreditation cycle (self-study due summer 2009).*

## 7. Accreditation Feedback (PIP Section II.5)

*This assessment measure was not used during the period addressed by this report.*

## II. Actions Planned as a Result of Assessment

The CE department faculty has reviewed the results from the various assessment measures provided in this report. In response, the department provides in Table II.1 a summary of ongoing and planned actions based on these findings.

TABLE II.1: PLANNED ACTIONS

Topic	Description	Intended Outcome(s)
AutoCAD	AutoCAD and its components (e.g., Land Development) have become essential to the CE curriculum. The Department will provide students with exposure to AutoCAD in a variety of contexts and levels. Specifically, the department will continue development of a new, required course, CIVL 110 <i>Graphics for Civil Engineers</i> , and will investigate possible means for incorporating AutoCAD in sophomore and junior course work.	Enhancement of a variety of professional and practical applications throughout the program.
GPS Applications	Last year the program was able to acquire a modern survey-quality GPS unit. Use of the instrument will be integrated into CIVL 131 <i>Introduction to Civil Engineering Design</i> , as well as other possible locations.	Maintain currency in the curriculum.
CE Projects Lab	The CE Projects Lab has become a vital, heavily used facility in the CE program. The department will work to improve this facility, both in terms of maintaining modern equipment and to improve student access. Last year, the entire lab was moved to a more secure location and the oldest computers in the lab were replaced with new workstations. The lab is now wired for Internet access as well.	Provide for a suitable computation, instruction, and work environment for CE students.
Student Chapters	The department will continue to support the various professional societies related to the program. The most recent addition is a local student chapter of Engineers Without Borders.	Enhance the professional aspects of the program, provide opportunities for student extracurricular activities and community service, and to improve student perseverance.
Internships	The department has worked to develop an expanded internship program for CE students at a variety of levels. A number of students have now completed internships for academic credit and the procedural documents used by the program require comprehensive updating. The list of CIVL courses in the University Catalog has been updated to include associated internship courses.	Provide students with relevant work experience and to augment student finances.
Major Course Availability	The department will pursue a number of fronts to improve the variety of courses available to CE majors. The list of approved technical electives was expanded last year. (The faculty chose not to modify the five CE patterns to make them more accessible, however). The department will attempt to offer a greater number and breadth of elective CIVL courses as new probationary faculty members are hired.	Improve student progress through the program and provide for some sub-discipline specialization.
Major Academic Advising	A number of improvements were planned for implementation, but few have been effectively realized. A trial run was made of automated prerequisite enforcement, but articulation of transfer student proved problematic. CE majors have not been consistently assigned academic advisors during their first term. In light of these shortcomings, additional efforts to improve academic advising and prerequisite enforcement are essential.	Improve student progress to degree and student performance in courses.

CE Program Goals and Objectives	The department's Professional Advisory Board (PAB) has recommended changes to the program's goals and objectives. The faculty will be considering these suggestions and will be making modifications as warranted.	Maintain currency of the program and mission clarity.
Assessment Surveys	Revision of the alumni survey instrument is currently in progress, based on suggestions received from the PAB. Revisions are also needed and are pending of the CE-specific senior exit survey instrument and the employer survey instrument. Survey data must be collected no later than the 2007-2008 academic year in order to be incorporated into the accreditation self-study report.	Provide current feedback from constituents on program effectiveness.
Return Rate on Graduating Senior Exit Survey	The return rate on this semi-annual survey is fairly low (about 40 - 65% over each of the past five years). The program will seek and implement various measures to help increase the portion of students returning the completed survey form.	Provide for more representative information on the program.

## APPENDIX A: Graduating Senior Exit Survey

TABLE A.1 GENERAL RESPONSE DATA (CE MAJORS ONLY)

Q3. Came to Chico State as a

Year	First-time freshman	Transfer	Total
02-03	8%	92%	100%
03-04	45%	55%	100%
04-05	25%	75%	100%
05-06	35%	65%	100%
	7	13	20

Q4. Semesters attended Chico State

Year	1-3	4-6	7-9	10-12	13+	Total
02-03	0%	33%	17%	50%	0%	100%
03-04	0%	30%	30%	40%	0%	100%
04-05	0%	67%	8%	17%	8%	100%
05-06	0%	58%	5%	21%	16%	100%
	0	11	1	4	3	19

Q5. Overall GPA

Year	<2.25	2.25-2.49	2.50-2.74	2.75-2.99	3.00-3.24	3.25-3.50	3.51-3.74	3.75-4.00	Total
02-03	0%	0%	25%	42%	25%	8%	0%	0%	100%
03-04	0%	0%	15%	50%	20%	10%	5%	0%	100%
04-05	0%	0%	9%	45%	18%	18%	0%	9%	100%
05-06	5%	20%	15%	0%	15%	30%	10%	5%	100%
	1	4	3	0	3	6	2	1	20

Q6. Value of internship, co-op, or job if related to major

Year	Not exper'd	Not valuable	Somew't valuable	Valuable	Very valuable	Total
02-03	8%	0%	0%	25%	67%	100%
03-04	10%	0%	0%	40%	50%	100%
04-05	33%	0%	0%	0%	67%	100%
05-06	10%	0%	5%	30%	55%	100%
	2	0	1	6	11	20

Q7. Value of involvement in societies, activities, clubs

Year	Not exper'd	Not valuable	Somew't valuable	Valuable	Very valuable	Total
02-03	33%	8%	25%	17%	17%	100%
03-04	5%	0%	47%	21%	26%	100%
04-05	25%	0%	17%	25%	33%	100%
05-06	25%	0%	15%	25%	35%	100%
	5	0	3	5	7	20

Q8a. Plans after graduation: Attend grad school

Year	Yes	No	Total
02-03	38%	63%	100%
03-04	40%	60%	100%
04-05	27%	73%	100%
05-06	7%	93%	100%
	1	14	15

Q8b. Plans after graduation: Begin working

Semester	Yes	No	Total
02-03	92%	8%	100%
03-04	100%	0%	100%
04-05	100%	0%	100%
05-06	95%	5%	100%
	18	1	19

Q9. Number of job offers received

Year	None	1	2	3	4+	Total
02-03	60%	20%	10%	10%	0%	100%
03-04	11%	44%	39%	6%	0%	100%
04-05	0%	13%	38%	0%	50%	100%
05-06	11%	32%	26%	11%	21%	100%
	2	6	5	2	4	19

Q10a. Likely to accept current job offer

Year	Yes	No	Total
02-03	33%	67%	100%
03-04	67%	33%	100%
04-05	75%	25%	100%
05-06	72%	28%	100%
	13	5	18

Q10b. Current job offer: Starting salary

Year	<\$30K	\$30-40K	\$41-50K	\$51-60K	\$61-70K	\$71K+	Total
02-03	0%	33%	67%	0%	0%	0%	100%
03-04	7%	36%	36%	21%	0%	0%	100%
04-05	0%	0%	83%	17%	0%	0%	100%
05-06	0%	15%	62%	23%	0%	0%	100%
	0	2	8	3	0	0	13

Q11. Interview at career planning office helpful

Year	Didn't use	Not helpful	Somew't helpful	Helpful	Very helpful	Total
02-03	90%	0%	10%	0%	0%	100%
03-04	69%	31%	0%	0%	0%	100%
04-05	63%	13%	13%	13%	0%	100%
05-06	72%	0%	6%	11%	11%	100%
	13	0	1	2	2	18

Q12. How did you find your job?

Year	Career Planning	Faculty referral	On-line posting	Mailed resume	Personal connect	Other	Total
02-03	29%	14%	0%	29%	29%	0%	100%
03-04	0%	0%	29%	6%	24%	41%	100%
04-05	0%	13%	25%	38%	0%	25%	100%
05-06	13%	19%	0%	6%	31%	31%	100%
	2	3	0	1	5	5	16

Q13. Took a comprehensive exam

Year	No	Yes, and passed	Yes, and didn't pass	Yes, waiting for results	Total
02-03	0%	83%	0%	17%	100%
03-04	0%	55%	0%	45%	100%
04-05	0%	83%	0%	17%	100%
05-06	0%	65%	5%	30%	100%
	0	13	1	6	20

Q14a. Took a review course prior to exam

Year	Yes	No	Total
02-03	75%	25%	100%
03-04	63%	37%	100%
04-05	75%	25%	100%
05-06	58%	42%	100%
	11	8	19

Q14b. Value of the review course

Year	Not valuable	Somew't valuable	Valuable	Very valuable	Total
02-03	22%	22%	11%	44%	100%
03-04	8%	38%	31%	23%	100%
04-05	0%	44%	11%	44%	100%
05-06	8%	17%	58%	17%	100%
	1	2	7	2	12



TABLE A.2 SATISFACTION AND PROGRAM OUTCOMES (CE MAJORS ONLY)

<b>Educational Satisfaction for CE</b>	Spring 02	AY 02-03	AY 03-04	AY 04-05	AY 05-06	
Scale: 1=Very Dissatisfied; 5=Very Satisfied	Mean	Mean	Mean	Mean	Mean	N
Q15. Quality of teaching by faculty in department	4.08	4.12	3.95	4.00	4.16	19
Q16. Quality of teaching by other faculty	3.58	3.53	3.60	3.17	3.53	19
Q17. Access to faculty in your department	4.08	4.18	4.50	4.58	4.42	19
Q18. Availability of courses in your department	3.83	3.76	3.35	3.67	3.05	19
Q19. Quality of courses in your department	3.83	4.00	4.00	4.00	3.84	19
Q20. Access to lab facilities and equipment	4.00	3.94	3.20	3.83	3.79	19
Q21. Quality of laboratories and equipment	3.25	3.25	3.30	3.17	3.11	19
Q22. Access to computer facilities	3.33	3.12	4.20	3.50	3.79	19
Q23. Quality of computer facilities	3.00	2.71	3.60	2.75	2.27	19
Q24. Academic advising from your major advisor	3.83	3.71	3.30	3.50	3.79	19
Q25. Academic advising from the Advising Office	3.33	3.18	2.89	2.64	2.78	18
Q26. Career advise from faculty in your department	3.83	4.00	3.40	3.45	3.95	19
Q27. Availability of GE courses	3.75	3.71	3.95	3.55	3.56	18
Q28. Quality of GE courses	3.50	3.47	3.60	2.75	3.17	18
Q29. Overall quality of your education	4.42	4.35	4.20	4.50	3.95	19
Q30. Overall experience at Chico State	4.58	4.59	4.30	4.58	4.21	19

<b>Program Outcome Trends for CE</b>	Spring 02	AY 02-03	AY 03-04	AY 04-05	AY 05-06	
Scale: 1=Very Unprepared; 5=Very Prepared	Mean	Mean	Mean	Mean	Mean	N
Q31. Apply knowledge to solve problems	4.20	4.18	4.35	4.67	4.32	19
Q32. Design and conduct experiments	3.60	3.94	4.10	4.17	4.21	19
Q33. Analyze and interpret experimental data	3.93	4.12	4.40	4.33	4.32	19
Q34. Design component or system to meet needs	3.33	4.06	4.10	4.08	4.11	19
Q35. Function on multidisciplinary teams	4.33	4.12	4.45	4.75	4.47	19
Q36. Identify, formulate, solve technical problems	4.07	4.24	4.40	4.67	4.37	19
Q37. Communicate technical matters in writing	4.20	4.18	4.50	4.50	4.37	19
Q38. Communicate technical matters orally	4.07	4.00	4.30	4.08	4.21	19
Q39. Understand professional, ethical responsibilities	3.73	4.00	4.35	4.25	4.53	19
Q40. Understand contemporary issues facing society	3.53	3.76	3.90	3.58	4.37	19
Q41. Use modern tools and technology	3.80	4.12	3.95	4.25	4.05	19
Q42. Enter the workplace	4.33	4.12	4.25	4.50	4.53	19
Q43. Continue learning	4.33	4.35	4.50	4.67	4.42	19

<b>Other</b>	Spring 02	AY 02-03	AY 03-04	AY 04-05	AY 05-06	
Scale: 1=Strongly disagree; 5=Strongly agree	Mean	Mean	Mean	Mean	Mean	N
Q44. Recommend major program to others	4.07	4.19	4.35	4.92	3.89	18

*Note: Current scores below 3.50 are highlighted.*

TABLE A.3 ECC SUPPLEMENTAL QUESTIONS (ALL ECC MAJORS VS. CE MAJORS)

Responses to College Supplemental Questions (new for 05-06)

Q1. Satisfaction with university-wide support in transition to Chico State

Year	Very Dis-satisfied	<----->			Very Satisfied	Total	Major
05-06	3%	9%	27%	33%	28%	100%	All ECC
	5	15	44	53	45	162	
	0%	0%	20%	20%	60%	100%	CE only
	0	0	1	1	3	5	

Q2. Satisfaction with department support in transition to Chico State

Year	Very Dis-satisfied	<----->			Very Satisfied	Total	Major
05-06	4%	4%	20%	31%	39%	99%	All ECC
	7	7	33	51	63	161	
	0%	0%	40%	0%	60%	100%	CE only
	0	0	2	0	3	5	

Q3. Frequency of meetings in University Advising office

Year	> Once a semester	Once a semester	Once a year	Occasion-ally	Never	Total	Major
05-06	6%	15%	19%	33%	28%	100%	All ECC
	10	24	30	53	45	162	
	0%	0%	20%	20%	60%	100%	CE only
	0	0	1	1	3	5	

Q4. Frequency of meetings with major academic advisor

Year	> Once a semester	Once a semester	Once a year	Occasion-ally	Never	Total	Major
05-06	17%	29%	24%	24%	6%	100%	All ECC
	27	47	39	39	10	162	
	20%	80%	0%	0%	0%	100%	CE only
	1	4	0	0	0	5	

Q5. Primary reason you chose Chico State

Year	Reputa-tion	Cost	Location	Family advice	Other	Total	Major
05-06	18%	6%	42%	6%	27%	99%	All ECC
	29	10	68	10	43	160	
	40%	0%	60%	0%	0%	100%	CE only
	2	0	3	0	0	5	

TABLE A.4 CE-SPECIFIC SUPPLEMENTAL QUESTIONS (CE MAJORS ONLY)

<b>Q6. CE Pattern Completed</b>	AY 04-05	AY 05-06
Construction	0	0
Environmental	0	1
Structural	6	3
Transportation	0	0
Water Resources	0	1

<b>Important Factors in Choosing CSU, Chico</b>	AY 04-05	AY 05-06	
Scale: 1=Not Important; 5=Very Important	Mean	Mean	N
Q7. Reasonable cost	3.91	3.88	17
Q8. Engineering program reputation	4.00	3.88	17
Q9. Geographical location	3.55	4.06	17

<b>Topic Emphasis in CE Program</b>	AY 04-05	AY 05-06	
Scale: 1=Not Enough; 3=About Right; 5=Too Much	Mean	Mean	N
Q10. Environmental	2.64	2.71	17
Q11. Geotechnical	2.55	2.71	17
Q12. Hydraulics	2.09	2.18	17
Q13. Structures	3.64	3.65	17
Q14. Surveying	3.27	2.82	17
Q15. Transportation	2.82	3.18	17

**Written Comments**

What did you like best about the CE program?

Interesting and challenging courses.  
 Helpful and supportive faculty, staff, and students.  
 Hands-on classes and laboratories. Small classes.  
 Active and social campus life.  
 Co-curricular activities (steel bridge, engineers w/o borders).  
 Structures courses, steel design.  
 Design projects and the ethics course.

What things do you suggest to improve the CE program?

More instructors should use methods like Prof. Emerson (ExCEED).  
 More engaging, better educated, and up-to-date faculty members who can also teach.  
 Fewer temporary instructors, fewer instructors without PhDs.  
 Newer and better laboratory equipment.  
 Include more use of structural drawings and greater emphasis on load estimation.  
 Some professors and academic advisors seem not to care or have no time for students.  
 More emphasis on real world preparation.  
 Improve the CE computer lab.  
 More variety of classes, especially electives and environmental classes.