



Instructional Program Review Summary 2004-05

Instructional Area: Math and Science

Department: **Physical Sciences**

Discipline: **Engineering**

February 22, 2005

Instructional Program Review Summary

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NOTE: An external reviewer should not be required to refer to the documentation notebook to understand the Instructional Program Review

Summary. Rather, data should be clearly cited in the summary so that the reviewer can easily find the source documents if needed.

EXECUTIVE SUMMARY

Use the following guidelines to provide a concise overview/summary of the program review contained in this report.

Write a brief description of the goals and objectives of the discipline.

The purpose of the Engineering Program is to provide students intending to major in engineering and related disciplines with the foundation skills required to investigate and analyze basic engineering problems. This will prepare them either for transfer and success in a baccalaureate-degree granting institution or to join the work force and improve their chances of advancement.

Overview of how the program review was conducted.

- The Program Review Committee was formed and met briefly for a very short session after one of the monthly departmental meetings where the review process was discussed briefly and the next meeting was scheduled.
- The next meeting was the SWOT session facilitated by Nancy Jokovich of OIE and held on 10/8/2004. The two student members of the committee were not present due to class schedule conflict. After the SWOT session, the committee briefly discussed the general approach to the review process. As the committee chair, I informed everyone that I will communicate with them electronically and keep them informed of how the review is coming along and I also will solicit their input and rely on their expertise in answering questions.
- Regularly, I informed the Department Chair of how the review is proceeding and discussed with him my answers to some of the questions and asked for his input throughout the process.
- Before the final version of the review report is forwarded to OIE personnel, I will ask the committee members for their input regarding the report especially the important sections on the *Executive Summary, Conclusions, the Program Summary Form*.

- If a final meeting is needed to discuss the conclusions of the report, then the committee will meet for that purpose.

Summary of findings:

Progress on previous program review recommendations.

- **The strategy to increase enrollment is there and has been communicated higher upward.** We need to roll over classes from one semester to the next even those sections which get cancelled.
- The engineering program is a very small program (currently we offer only 3 sections in the Spring semester and four sections in the Fall). Not rolling over a cancelled section means canceling 30% of the program.
- **The way to increase enrollment is to offer more sections, not less.**
- **The recommendation to increase retention has been addressed through proposing smaller class limits.** Also proposing a recitation session of 90 minute duration once a week on Fridays. This session must be manned by a faculty member, not a member of the tutoring lab.
- **Technology has been integrated somewhat in the classroom.** Technology will be integrated even more if and when the program is given the luxury of an annual budget. This is a must if the program is to succeed in fulfilling its mission.
- **Course objectives have been approved for all engineering courses** other than ENGR 1201. This will be done within the next school year.
- **Establishing ongoing interaction with the scientific community such as engineering firms and UT engineering has proved more difficult** than expected. An attempt was made on our part to start interaction with our UT counterparts which did not succeed at least for the time being. We will continue attempts to increase interaction with the Austin professional engineering community. This will be one of the program's objectives in the near future.

Program strengths.

- The engineering program **performs a very important and unique function in the service of our students and the Austin community** that is consistent with the vision and the mission of the College.

- The program offers its students **standard engineering courses**, at a low cost, in a small class environment conducive to increased student-instructor interaction and increased student learning. These courses transfer to almost all colleges and universities.
- The program has **high quality faculty teaching its classes**. Their interest lies in challenging their students to meet and exceed course objectives and prepare them to succeed after ACC.

Areas for improvement.

- The program must **secure an annual (supplies) budget** so we can purchase gadgets for students to work on projects in ENGR 1201 and demonstration apparatus for other courses. This is a must if this program is to make any meaningful improvements.
- **Dedicated computer work area** for engineering students to work on problems and projects associated with engineering classes.
- **Get course objectives approved for ENGR 1201**. This will allow us to establish a list of required topics for this class which is bound to increase enrollment and allow the students to get much more out of this class.
- **Increase enrollment** by recruiting. Get the word out to all AISD schools about the engineering program at ACC. Also increase enrollment by increasing section offerings.
- **Improve retention and success**. To this end, we must adopt 20 as a limit on class size. Also the program must pursue the idea of adding recitation sessions on Fridays for ENGR 2301, ENGR 2302 and ENGR 2332.

Key planning issues.

- Our key planning issues and activities are centered around the areas of program improvements discussed above. There are many things the program does right. We should copy those successes in our improvement issues.
- The Department Chair needs to do whatever it takes to make sure that the engineering program has a supplies budget in the next fiscal year. This is one key planning issue that we plan to make a number one priority. **It is embarrassing to the instructor not to have the money to spend a couple of hundred dollars on gadgets to purchase for at least one hands-on student project in the Introduction to Engineering course.** Such a hands-on project would make a huge difference in the quality of the course.

- **Propose to make changes in the ENGR 1201 course objectives** and the addition of a hands-on student project. It will become a “foundations” course.
- **Propose a structured timetable for increasing section offerings and increasing enrollment.** The details will be worked out with the Department Chair and the Dean of Math and Sciences. I would like to see the engineering program be given an opportunity to grow and be allowed the time to show it can sustain such growth.
- **Offer recitation sessions in conjunction with ENGR 2301, ENGR 2302 and ENGR 2332 once a week on Fridays for a length of 1.5 hours.** These sessions will be conducted by the instructor. This is important to improve retention and success of students. Almost all sophomore and junior UT engineering courses have such recitation sessions where students get problem-solving help on homework and preparation for exams. All the above courses were four-credit courses. Now they are all three-credit courses since we switched to the common course numbering system. We have lost a lot of class time in the process. This negatively impacts student learning and retention.

Conclusions: What are the major conclusions regarding the present state of the program?

- **The engineering program performs an excellent service to its students** preparing them either to transfer to 4-year engineering programs or jump into the work force and qualify for higher paying professional positions.
- **The courses are up to date and cover standard material that is an integral part of the engineering education.** The exception is ENGR 1201 which will be upgraded in the next year by adopting a list of required topics and course objectives.
- **The program offers three courses on a regular basis: ENGR 1201, ENGR 2301 and ENGR 2332.** The first two are required for the Associate of Science degree in Engineering. The third is a suggested technical elective.
- **ENGR 2302 needs to be offered on a regular basis once a year in the Spring semester as agreed upon.**
- **We believe the teaching in all the engineering courses is competent and the students get the necessary preparation.**
- **The engineering program has lost sections and enrollment in the last five years.** Cancelled sections must be allowed to roll over the next semester. The engineering program is a very small program by nature and such a rule is detrimental to the growth of the program.

- **The engineering program is in good shape now** and all the planned steps for improved retention, increased sections and enrollment should put the program in an excellent position.

Recommend future directions for the program based on this review:

- X Expand services
- Maintain services
- Reduce services
- Close program

Recommendations: Summarize the self-study's recommended actions for improving the quality of the program.

1. **We recommend that the program be given an annual supplies budget to purchase items needed to teach the engineering courses.** An annual budget of \$1000.00 is suggested initially with a 10% annual increase for the next five years.
2. **We recommend increasing section offerings** including offering ENGR 2302 on a regular basis. This will increase enrollment. The ramping up should be deliberate and gradual as proposed in the planning issues described above.
3. The retention rates are well within College limits. **We recommend approving the proposed recitation sessions to improve student retention and success.**

SELF-STUDY TEAM PARTICIPANTS

List the names of people who participated in the review and their association with your program.

Name Dr. Saad Eways ACC Faculty Industry Representative
 Student

Name Dr. Ron Johns ACC Faculty Industry Representative
 Student

Name Dr. Paul Williams ACC Faculty Industry Representative
 Student

Name Dr. James Friedrichsen ACC Faculty Industry
Representative Student

Name Dr. Paul Nacozy ACC Faculty Industry Representative
 Student

Name Prof. Elliot Richmond ACC Faculty Industry
Representative Student

Name Mr. Leon Sparks ACC Faculty Industry Representative
 Student

Name Mr. Mark Dube ACC Faculty Industry Representative
 Student

Name ACC Faculty Industry Representative Student

PROGRAM DESCRIPTION

Provide a brief description of the overall history, major developments and current objectives for your program (limit to 500 words).

- The engineering program was part of the physics program. We taught two standard engineering courses which were at the time required from the majority of engineering students. These were: PHY 2654, Engineering Mechanics I and PHY 2664, Engineering Mechanics II. They were structured after equivalent standard courses taught at UT and most other major institutions. They transferred to UT as engineering courses.
- About 10 years ago, we split the engineering program from the physics program and added two other courses: ENGR 1201, Intro to Engineering and ENGR 2332, Mechanics of Materials. Three of our four courses are standard engineering courses which have equivalents at other universities and therefore transfer to almost all universities. ENGR 1201 is not a

standard engineering class. It transfers to UT as 2 credit hours of science elective.

- About 5 years ago, we converted all courses to the common course numbering system. This forced us to change three of our courses from 4.00 credits to 3.00 credits. This impacted the amount of material we cover in each of these courses but did not impact their transferability.
- At around the same time, the College suggested that we offer two of our courses once a year only since they are high end courses and do not garner large enrollment. Based on this agreement, the course will be allowed to run with an enrollment smaller than the required minimum number of 12. So ENGR 2332 is offered in the Fall semester only and ENGR 2302 is offered in the Spring semester only.
- Even so, a couple of years ago, ENGR 2302 was cancelled due to low enrollment and has not been reinstated in the schedule ever since. Our plan is to ask the College to offer ENGR 2302 every Spring semester to see if it attracts enough students.
- The current objectives of the engineering program, like they have always been, are to give our students the best learning experience possible. In the engineering courses they take at ACC, we intend to provide them with the foundation skills they will need to investigate and analyze basic engineering problems. This is an important step in their preparation for transfer and success in obtaining a BS degree in engineering or to join the work force and improve their chances of advancement.

STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS (SWOT)

List the names of people who participated in the SWOT and their association with your program.

Name Dr. Saad Eways ACC Faculty Industry Representative
 Student

Name Dr. Ron Johns ACC Faculty Industry Representative
 Student

Name Dr. Paul Williams ACC Faculty Industry Representative
 Student

Name Dr. James Freidrichsen ACC Faculty Industry
Representative Student

Name Dr. Paul Nacozy ACC Faculty Industry Representative
 Student

Name Prof. Elliot Richmond ACC Faculty Industry
Representative Student

Name ACC Faculty Industry Representative
Student

Summarize the findings of the SWOT analysis. Focus on the top 5 or 6 issues and answer the following questions:

Strengths: In what does your program excel?

- Transfer Function 4 dots
 - ? Transferability to UT
 - ? Proximity to UT
 - ? Large student body at UT to draw from
 - ? Transferability
 - ? Standard courses
 - ? Good transfer success to UT
 - ? Excellent transfer success
 - ? Met courses equivalent in level to 4-year engineering schools
 - ? Transferability to major Texas Engineering Program
- Student Success 3 dots
 - ? High student retention
 - ? High GPA
 - ? High student success rates
 - ? High success for students
 - ? Highly selected students
 - ? Reasonable number of Associate of Science awarded
- Quality Faculty 2 dots
 - ? Excellent faculty
 - ? Mode of instruction
 - ? Quality of instruction
 - ? Dedicated teaching faculty rather than research professors with several TAs
 - ? Good pool of faculty
 - ? Diversity of faculty backgrounds
- Small Class Size 2 dot
 - ? Small class size
 - ? Relatively small classes (low student/faculty ratio)
- Fit to Community 1 dot
 - ? Low cost to students
 - ? Many non-traditional students
 - ? Underserved populations
 - ? Community demographics
 - ? Austin being hi-tech city
 - ? Access to faculty
- Institutional Success 0 dot
 - ? High enrollment in most sections
 - ? High profit

Weaknesses: What are the aspects of your program, which, if not addressed, will impede the area's future?

Transferability, particularly UT 5 dots

? UT is a moving target

? Lack of program intensity (distributed courses)

? UT and dynamic transfer

? Transferability of intro course

? Misfit of program to EE

? Student unwillingness to consider options to UT

? UT offers some similar courses

? Dependency on UT

? Curriculum alignment (math, UT, physics)

? Lack of interaction with UT

Institutional Issues 4 dots

? Not required for non-engineering majors

? Institutional confusion with Engineering Technology

? Lack of space for student support

? Institutional confusion with Commercial Music (Audio Engineer)

? Too many rules hampering department efforts

? Institutional recognition/value

? Administrative confusion with English

? Low profile to administration

? Difficulty in adding new sections

? Administrative choke hold on courses

Access 2 dots

? Number of sections

? Concentration of offerings at NRG/RGC

? No summer sections

? Limited offerings

? Courses offered at more campus (assuming they make)

? Limited campus offerings

Enrollment 2 dots

? Class limit too large

? More students would allow courses to make more often

? Limit classes to 20 students

Budget 2 dots

? Lack of financial support

? No budget

? Limited budget

Instructional Technology 2 dot

? Some student computer usage?

? Limited technology (CAD, etc)

- ? No labs
- ? Lack of lab/field?
- Texas Common Course Numbering System 1 dot
- ? Where's the circuit course
- ? Difficulty in enriching program
- ? Common course numbers
- ? Amount of time to deliver material, 3 hours vs. 4 hours

- Student Population 0 dots
- ? Counseling/Advising
- ? System deficiency checking pre-requisites
- ? Math background

Opportunities: What factors does your program need to take advantage of in order to enhance the quality of the area?

- Coordination with Industry 5 dots
- ? Advisory committee composed of Industry and UT Engineering Faculty
- ? Industry input
- ? Engineering employment opportunities in Austin
- ? Growing community
- ? Increase interaction with Austin hi-tech
- ? Potential for coordination with local engineering businesses
- ? Hi-tech boom/bust
- ? Placement/internships
- ? Hi-tech companies close by
- ? Relationship to local/national corporations
- ? Apparently, good community support
- ? Make use of Austin hi-tech
- Higher Education Coordination 5 dots
- ? Closer coordination with UT
- ? Articulation agreements
- ? UT College of Engineering input
- ? Input from Texas A & M Engineering College
- ? Other (not UT) higher education institutions (A & M?)
- Curriculum Innovations 3 dots
- ? Seek external funding for instructional innovation
- ? New engineering software packages?
- ? National trend to make intro course design project oriented
- ? New Texas Common Course Number courses with labs
- Promote Student Success/Access 3 dots
- ? Large client base
- ? To increase minority participation
- ? High client approval rating
- ? Underserved populations

- ? To increase student success
- ? Promote transfer success of our program
- Outreach to Schools 2 dots
- ? Generate excitement with cool stuff
- ? Outreach to area high schools
- ? Engineering program at Leander ISD
- Increase Faculty 0 dot
- ? Broad, diverse faculty pool (UT students want to stay in Austin)
- ? Influx of new faculty because of SACS
- College Expansion 0 dot
- ? Expansion of CYP
- ? Expansion of South Austin Campus
- NASA 0 dot
- ? NASA programs
- ? NASA programs for students
- ? NASA programs for faculty
- Administrative Relations 0 dot
- ? Budget can only get bigger
- ? Increase coordination with other science departments
- ? Better coordination with administration

Threats: What are the external factors that could negatively impact your program's future?

- Administration 5 dots
- ? Confusion with Engineering Technology programs
- ? Institutional racism
- ? Administration rules about cancellation of sections
- ? Antipathy from administration
- ? Losing sections forever
- ? ACC apathy towards program
- UT/A & M 4 dots
- ? UT and A & M not accepting Engineering transfer courses
- ? Not keeping courses in-line with UT/A & M courses
- ? UT acceptance of our courses
- ? UT
- ? UT changing whims
- External Standards 1 dot
- ? Not keeping courses current
- ? THECB standards
- ? American Board of Engineering Technology
- ? Moving transfer standards
- Local Job Demand 1 dot
- ? Loss of community support
- ? Eroding tax base

- ? Decline of the semiconductor industry
- ? High-tech slow down
- ? Hi-tech bust
- Small Program/High Risk 1 dot
- ? Lack of outreach/recruiting
- ? Small discipline/high end courses
- Competition 0 dot
- ? Competition from on-line degree programs and certificate programs
- ? On-line or distance learning courses
- ? Competition from for-profit degree "mills"

- National Trends Driving Enrollments 0 dot
- ? Job outsourcing
- ? Nationwide declining enrollments in Engineering
- ? Declining foreign enrollments
- ? Off shore - outsourcing of technological jobs

Discuss changes from the program's previous SWOT analysis.

- This year, the SWOT analysis was more extensive than the previous one. More faculty got involved and also this time around we used a facilitator from the OIE office. In principle, there are only minor changes from the previous SWOT analysis.

ANALYSIS

[a] Relevance of the program to College mission and desired ends

Mission:

Review the program's purpose statement. Verify that the statement is current and accurate and reflects the mission of the college as a whole or update the purpose statement.

The Self-Study team reviewed the program purpose statement and found (select one):

The purpose statement is current, accurate, and reflects the mission of the college.

The purpose statement was revised as shown below:

Desired Ends (Board Policy A-2. Intended Outcomes)

How well does the program support the intended outcomes of the college by providing “service-area adults with the postsecondary and higher education they need and can use for productive useful lives?”

- Austin is a high tech center and a center of constant growth. The community demands an educated work force. The engineering program at ACC plays an important role in preparing students for success in this area.
- The vast majority of students taking engineering and pre-engineering courses at ACC intend to transfer to a 4-year university and obtain a BS degree in one of the engineering disciplines or other science disciplines such as Biology or Computer Science. Only a small fraction of the students progress directly into the workforce. Another small fraction is already in the work force and seeks advancement or promotions to managerial positions which are made more accessible by those students acquiring an Associate of Science degree in Engineering.
- Of those students who transfer, the majority transfer to the University of Texas at Austin. These students do well at UT. ACC students make up the largest segment of UT transfer students in engineering. Our information from UT is that they do well and mostly graduate with a BS degree in engineering.

In what ways does the program demonstrate an open, responsible exchange of ideas?

- Through our departmental monthly meetings and departmental professional development meetings. In these meetings, we discuss selection of textbooks and student study guides, and any changes in the curricula of our courses. The faculty of the engineering program work collaboratively with other faculty from the Physical Sciences Department such as physics, astronomy, geology and environmental science.
- Generally the guidelines of the program are developed collaboratively with the other programs in the department and are consistent with the general guidelines of the department.
- Here are some examples: 1) Five years ago, the program switched all its classes to the common course number system. In the long run this is a positive step. 2) Discussion among the faculty teaching ENGR 1201 about requiring a higher level math class as a prerequisite.

In what ways does the program provide an open door to educational potential?

The program provides an open door to students to achieve their educational potential in many ways:

- We serve many students who would have no way other than ACC to accomplish their long term objectives of obtaining a BS in engineering. These are students whose high school academic record is not good enough for them to be accepted by an engineering program at a 4-year university like UT. So at ACC they "catch up". We offer them the right environment where they can take all the pre-engineering courses. Those who work hard and apply themselves, do well and are now in a much better position to transfer to a four-year university and obtain a BS degree in engineering. I believe this is a very important function of our program. This is the role which our program plays: it is that of a pipeline into the world of professional engineering for underprepared and underrepresented students in the Austin Community.
- We serve work-force students looking to obtain the AS degree and allow themselves to advance to higher-paying positions such as managerial positions.

In what ways does the program take targeted action to address internal needs within available resources?

- The program is constantly seeking improvement through interaction with faculty from other programs and departments. We are always looking for ways to improve our way of educating our students and improving their chances of succeeding. The entire Physical Sciences Department attempted a partnership with our counterparts at UT primarily with the College of Engineering. Nothing came out of that attempt. We will work to develop partnerships within and outside the College which will ultimately work to the benefit of our students.
- The engineering program has looked at and will continue to look at expanding course offerings and increasing enrollment.
- Constant discussion to upgrade ENGR 1201.

In what ways does the program demonstrate a commitment to integrity and exemplary standards?

- The faculty of the engineering program constantly strive toward excellence. The annual faculty evaluations and student feedback point to our faculty's commitment to serve our students and preparing them for future course work and careers.
- The engineering faculty are committed to improving student retention and student success by going above and beyond the call of duty such as offering the recitation sessions.

In what ways does the program demonstrate personal and professional ownership that generates accountability?

- As the lone full time faculty in engineering, (Saad Eways) along with the Department Chair (Dr. Ron Johns) continue to anticipate future needs and trends which will help the engineering program evolve and grow. Over the last four years:
- We have changed all our course numbers to the common course number system.
- Continue to discuss with the Dean the advantages of reducing the enrollment limits for some of our classes which are problem-solving intensive and a smaller class size would be a big plus for the students and would without a doubt improve retention.
- Continue to request that the course ENGR 2302 be reinstated in the course schedule and be offered every spring semester. We need to give this class a chance every year, not once every five years.

[b] Responsiveness to community needs and satisfaction of community demand

In what ways does the program address a verifiable need for the student, community, and society?

- The engineering student spends the first two years of their college career taking what is called "pre-engineering" classes. These are the calculus sequence and differential equations; the engineering physics sequence and chemistry. These classes are the "basics". With the exception of physics, these classes are offered at all the campuses. Physics is offered only at RGC, NRG and RVS. The Math and Science division makes every effort to accomodate all students intending to take these classes.
- The engineering courses are offered at RGC and NRG only and every attempt will be made to offer them at other campuses when the need arises. These engineering courses along with the "basics" described above, form the "science" part of the engineering degree plan. These are the courses required for nearly all engineering majors.
- The engineering and pre-engineering courses we offer satisfy the need which exists now. Very few students are turned away due to lack of space in engineering classes. When they start at ACC, many of our students lack the qualifications and the resources to start their engineering education elsewhere. At ACC, they can satisfy their deficiencies and advance their education to the point where they can transfer to four-year institutions. Not only are they accepted by these institutions now, they also have qualified themselves to compete with everyone else and do very well. The link to that education and to a College degree is ACC. The engineering program plays an important role in preparing aspiring engineering students to get to that point. The program will make every attempt to expand its course offerings and be ready to meet the student demand.

Describe the results of the program's most recent assessment of community need.

- Our assessment of community need is based on the fact that students are not turned away for lack of space in engineering classes. Austin is a high tech city where the demand for a work force educated in the sciences and especially engineering is very high. We must adequately prepare our students to meet this demand.
- The engineering program has done no other assessment of community needs

How do the program's five-year enrollment trends compare with those of the College overall?

- The enrollment in engineering classes has decreased since FY 2000 with the largest decrease between FY 2000 and FY 2001. The only reason I could think of for the large drop in enrollment is the change in course numbers. This was not accompanied by a change in the listing of courses on the UT web site for ACC engineering courses which transfer to UT. This resulted in some confusion which took time to straighten out.
- We need to go back to offering one section of ENGR 2301 at RGC and another at NRG during the regular session and one section of ENGR 2301 in the summer session at RGC.
- The College has made it difficult to roll over a section of a certain course in the course schedule for a given semester if that section was cancelled the previous semester. This may not affect large programs, but we think it is detrimental to smaller programs like engineering.

[c] Accessibility to students and identification of unnecessary barriers

Analyze when and where courses are offered (by campus, time of day, mode of delivery).

Table (1): Enrollment by course and campus for the previous five years. Note: engineering courses are offered at the Northridge and Rio Grande campuses only.

	FY 2000		FY 2001		FY 2002		FY 2003		FY 2004	
	NRG	RGC	NRG	RGC	NRG	RGC	NRG	RGC	NRG	RGC
ENGR 1201	83	63	80	40	52	32	42	42	43	38
ENGR 2301	33	49	9	39	25	31	13	34	26	20
ENGR 2302	-	-	-	7	-	9	-	-	-	-
ENGR 2332	-	6	-	11	-	12	-	7	-	18
Total	116	118	89	97	77	84	55	83	69	76

Table (2): Number of sections by course and time of day for the previous five years. Note: M=morning, A= afternoon and E=evening.

	FY 2000			FY 2001			FY 2002			FY 2003			FY 2004		
	M	A	E	M	A	E	M	A	E	N	A	E	M	A	E
ENGR 1201	2	3	3	3	1	3	2	1	2	1	1	2	1	1	2
ENGR 2301	-	2	2	-	3	1	1	2	1	-	2	1	-	1	1
ENGR 2302	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-
ENGR 2332	-	-	-	-	1	-	-	1	-	-	1	-	-	1	-
Total	2	6	5	3	5	5	3	4	4	1	4	3	1	3	3

List the number of sections taught (by location).

Table (3): Number of sections by course and campus offered for the previous five years.

	FY 2000		FY 2001		FY 2002		FY 2003		FY 2004	
	NRG	RGC	NRG	RGC	NRG	RGC	NRG	RGC	NRG	RGC
ENGR 1201	5	3	5	2	3	2	2	2	2	2
ENGR 2301	2	2	1	3	2	2	1	2	1	1
ENGR 2302	-	-	-	1	-	1	-	-	-	-
ENGR 2332	-	1	-	1	-	1	-	1	-	1
Total	7	6	6	7	5	6	3	5	3	4

List the number of sections closed or canceled per course.

Table (4): Cancelled sections by course for the previous five years. Note that we started offering ENGR 2302 again in the Spring of 2001 after a 5 year hiatus. It was offered only in the Spring semester and it was allowed to run for two consecutive years with an enrollment around 8 students. The course was canceled for Spring 2003 and was not offered for Spring 2004

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
ENGR 1201	1	3	4	1	-
ENGR 2301	1	2	-	-	-
ENGR 2302	-	-	-	1	-
ENGR 2332	1	1	-	-	-
Total	3	6	4	2	-

How does each of the five-year demographic trends (gender, ethnicity, age group) for this program compare to the overall college trend? (List the source of your information.)

Table (5): Demographic trends (ethnicity, gender and age) for the engineering program for the period FY 2000 – FY 2004.

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
White	136 54.1%	120 64.5%	93 57.8%	77 55.8%	86 59.3%
African American	18 7.7%	12 6.5%	11 6.8%	7 5.1%	6 4.1%
Hispanic	48 20.5%	33 17.7%	32 19.9%	31 22.5%	28 19.3%
Asian	21 9%	17 9.1%	13 8.1%	9 6.5%	15 10.3%
American Indian	0 0%	1 0.5%	0 0%	2 1.5%	2 1.4%
Non-resident Alien	11 4.7%	2 1.1%	9 5.6%	10 7.2%	8 5.5%
Total	234	186	161	138	145
Average Age	24.6	25.0	25.0	23.7	24.5
Male	187 80%	144 77.4%	128 79.5%	115 83.3%	120 82.8%
Female	47 20%	42 22.6%	33 20.5%	23 16.7%	25 17.2%
Total	234	186	161	138	145

- The source of the numbers in the table above is the data given in the black booklet provided. The numbers were combined to give the total for each fiscal year and the average student age was calculated using the weighted average formula.
- No data are readily available on the percentages of students from the various ethnic groups and the percentages for students based on gender. Therefore I can not make a comparison between the engineering program and other programs or to the College averages as a whole. Generally, the percent of male students in engineering is higher than other disciplines such as liberal arts and humanities. This is true even at four-year universities nationwide.

Identify any unnecessary barriers to students, especially those who are educationally disadvantaged and not well served by other colleges.

- There are NO unnecessary barriers to students especially those who are educationally disadvantaged and not well served by other colleges.
- By the nature of the engineering discipline, the engineering courses in a community college are considered upper-end courses. Before a student can start to take engineering classes, they need to pass one year of calculus and one semester of engineering physics. The exception to this is ENGR 1201, Introduction to Engineering, which has Trigonometry as a prerequisite. This is the main reason the engineering program is small.

[d] Student outcomes including participation and successful-completion rates

How do course completion rates (A-B-C-D rates) for courses within this program compare to College norms?

Table (6): Mastery/non-mastery rates by course for the period Fall 2000 through Spring 2004. Mastery = grades of A, B and C. Non-mastery = grades of D, F and W.

Semester/ Year	Mastery/ Non- mastery	ENGR 1201	ENGR 2301	ENGR 2302	ENGR 2332
Fall 2000	M	67%	74%	---	---
	N	33%	26%	---	---
Spring 20001	M	68%	75%	100%	64%
	N	32%	25%	0%	36%
Summer 2001	M	78%	20%	---	---
	N	22%	80%	---	---
Fall 2001	M	76%	64%	---	58%
	N	24%	36%	---	42%
Spring 2002	M	65%	61%	67%	---
	N	35%	39%	33%	---
Summer 2002	M	73%	---	---	---
	N	27%	---	---	---
Fall 2002	M	60%	78%	---	57%
	N	40%	22%	---	43%
Spring 2003	M	65%	47%	---	---
	N	35%	53%	---	---
Fall 2003	M	65%	65%	---	56%
	N	35%	35%	---	44%

Spring 2004	M	79%	50%	---	---
	N	21%	50%	---	---

Table (7): Program Non-mastery rates (D, F and W) for Fall 97 and Fall 2001.

Fall 97	Fall 2001
32.6%	30.8%

- There is much variation between semesters and between courses as can be seen from table (6) above.
- Table (7) shows the overall program non-mastery rate for the Fall 2001 is 30.8% which is well within the overall College non-mastery rate of 31.2%.

Table (8): Non-transfer rates (Grades of D and F) for Fall 97 and Fall 2001.

Fall 97	Fall 2001
10.1%	5.1%

- The overall college non-transfer rate is 8.7%. Our program's rate has been reduced and is well within this limit.

What are the program completion or graduation rates (compared to intent as well as overall) for this program?

- The large majority of students taking courses in engineering are not seeking to acquire the Associate of Science degree. They are seeking to transfer their engineering and pre-engineering courses to four-year colleges and universities in order to earn the Bachelor of Science degree in one of the engineering disciplines.
- Some of our students are UT students who cross over to ACC to take classes and the same applies to them.

Table (9): Program completion or graduation by ethnicity and gender for the four-year period 7/1/99 – 6/30/2003.

		7/1/99 – 6/30/2000	7/1/2000 – 6/30/2001	7/1/2001 – 6/30/2002	7/1/2002 – 6/30/2003
Nonresident Alien		2	0	0	0
African-American		1	0	0	3
Asian or Pacific Islander		2	2	1	0
Hispanic		1	1	0	6
White		8	14	3	6
Total	Men	12	15	4	13
	Women	2	2	0	2

Table (10): Associate of Science (AS) degrees awarded by the engineering program for the academic years 1999 – 2003.

1998 – 1999	1999 - 2000	2000 - 2001	2001 - 2002	2002 - 2003
18	13	12	8	15

How do withdrawal rates for courses compare to College norms?

Table (11): Withdrawal rates by course and semester for the period Fall 2000 through Spring 2004. For Fall 2001, the College withdrawal average is 22.5%.

	ENGR 1201	ENGR 2301	ENGR 2302	ENGR 2332	Program Average
Fall 2000	27%	21%	---	---	26%
Spring 2001	21%	25%	0%	18%	20%
Summer 2001	11%	20%	---	---	14%
Fall 2001	21%	32%	---	25%	26%
Spring 2002	32%	32%	33%	---	32%
Summer 2002	27%	---	---	---	27%
Fall 2002	28%	15%	---	29%	24%
Spring 2003	26%	32%	---	---	28%
Fall 2003	26%	19%	---	17%	22%
Spring 2004	13%	35%	---	---	21%

Table (12): Withdrawal rates (W) for Fall 97 and Fall 2001.

Fall 97	Fall 2001
22.5%	25.6%

- As can be seen from table (11), there is much variation in the W rates between courses and semesters.
- Table (11) also shows the program average rate for each semester. These rates are not much different than the overall College withdrawal rate of 22.5%. Table (12) also illustrates the same point; a slight increase from Fall 97 to Fall 2001 but well within a reasonable range of the College average.

What do the results of the program's student learning outcomes assessments (departmental final exams, exit tests, standardized tests, etc.) indicate about the program?

- The assessment outcomes indicate that the program is achieving its goals. The program intended outcomes state that: *Students in ENGR*

2301 will be able to apply the basic principles of static equilibrium to three-dimensional equilibrium engineering problems.

- The program assessment procedures and criteria state that: *Each final exam in ENGR 2301 will include a problem on the application of the principles of static equilibrium to a three-dimensional equilibrium problem. The average score on this problem for all students taking ENGR 2301 will be at least 75%.*
- Even when this criterion is not achieved or exceeded, the outcome is usually very close. Problem solving in engineering is very crucial to the training of engineering students and the type of problem used in our assessment is central to the study of static equilibrium which in turn is the main point of the subject matter in ENGR 2301.

[e] Measures of program quality and educational value added

- **Academic Standards**

What are the processes and procedures that the department uses to maintain academic standards and achieve consistency within the department?

- With the exception of ENGR 1201, all the other engineering courses have a standard subject matter which is more or less accepted everywhere. For these courses we have a list of required topics which constitutes the minimum material needed to be covered by all instructors. The program is small enough and communication between instructors is constant about how to accomplish educational objectives in the various courses.
- Although the program at this point does not have written guidelines governing exams and grade distributions, these are constantly monitored through communication with the faculty and the Assistant Department Chair and the results are satisfactory.
- Without any question, the academic standards in our program are high. The feedback we get from our students transferring to UT engineering and also from UT engineering students coming to take classes at ACC indicates that such a conclusion is valid. Our small class sizes give our instructors the opportunity to give one-on-one help and focus on the students who need the help more than others. This is a big advantage to our program and one of the reasons for our success.

- **Curriculum**

What procedures are used to assure that the curriculum is current and adequately meets the needs of students?

- Current and up-to-date textbooks are adopted for our courses. In fact the textbooks we use are the known leaders for these courses. They come with all the ancillary materials helpful to the student and instructors. They

have a CD which can be used by the student to solve problems. For the instructor, they have a CD which has power point presentations and all of the graphs and diagrams from the book.

- As was mentioned earlier, the curriculum for our courses (with the exception of ENGR 1201) is standard and much agreed upon everywhere. Hence when we cover the required material, we know that we have met the needs of the students.
- What we continuously strive to do is to make the process of meeting the students needs as efficient as possible. This, of course, is an ongoing process and we will continue to be aware of current developments in teaching methodology.

Are learning outcomes defined for courses and the program? Yes No
Are course texts up-to-date?. Yes No
Are course and program listings in the ACC Catalog up-to-date? Yes No
Do all courses have up-to-date syllabi on file? Yes No

Evaluate the use of instructional resources (including those in the library).

- The library resources are very good. The librarian in charge of procuring engineering books and other materials keeps us up to date about new acquisitions.
- The Media department resources are also quite good. The Media department has a collection of video tapes which are relevant to the subject matter of ENGR 1201. The students in this course use this resource. Also we use the Media department computers in the classroom at times.
- The faculty of the engineering program use the resources of the physics department extensively. If it were not for this arrangement, the engineering program could not possibly exist considering that it has no operating budget. This has to change since physics can not give us everything we need.
- Through the efforts of the Physical Sciences department chair (Dr. Ron Johns), we recently acquired two projectors permanently wired in rooms RGC 328 and 331. Each is connected to a computer and can be used to project online materials, materials on CD and video tape. They are used extensively in the engineering classes at RGC.
- The program lacks the budgetary resources to purchase instructional materials for its courses when needed. Examples such as purchasing materials to allow ENGR 1201 students to work on student projects come to mind. Now these students work on theoretical projects. It would be nice to have at least one hands-on project for the students to work on.

Evaluate the extent to which technology impacts the mode of instruction, including the number of courses and sections taught via distance learning.

- The courses taught by the engineering program, with the exception of ENGR 1201, are problem solving courses. That is the primary activity of engineering students. And that is what we try to do in our classes. Technology is used in the class room to the extent it enhances learning and makes it more efficient.
- Technology is used in our classrooms mainly through the use of the internet (not extensively) and the use of publisher-provided CD's which contain power point presentations and all of the graphs and diagrams from the textbook. This has made things easier and faster because the instructor does not have to spend time drawing complicated diagrams on the board. He just uses the computer to project them on the board and they look much clearer than a diagram drawn on the board by hand. This does not sound like a big deal, but it has made a positive difference in all the classes.
- We do not teach any classes via distance learning. The reason is the fact that engineering classes are problem-solving intensive.
- There are some research problems or projects which I assign to my ENGR 1201 students now and which I would not have dared assign several years ago. The student's accessibility to the internet makes that possible.

Evaluate the extent to which instruction is focused on problem solving, active learning, and work-based elements.

- The instruction in ENGR 2301, ENGR 2302 and ENGR 2332 are completely focused on problem solving. A class period is generally divided into a small amount of time for discussion and a whole lot of time for problem solving.
- In the class the student is asked to solve problems under the instructor's supervision. Those who do not complete the problems or do not do them correctly are given the help needed and asked to finish them at home and bring the corrected problems with them to class next time. This is done in addition to the homework assigned.
- Nearly 80% of the student's studying time is solving problems.

List below the current discipline-specific courses within the program and the date of the latest review.

Course ENGR 1201
Course ENGR 2301
Course ENGR 2302
Course ENGR 2332

Date of Last Review Fall 2003
Date of Last Review Fall 2003
Date of Last Review Fall 2003
Date of Last Review Fall 2003

- **Faculty**

Do all faculty teaching in the program meet SACS requirements?

Yes No (if no, please explain)

What is the ethnic diversity of the faculty?

- Although there are 5 adjunct faculty on the engineering program eligibility list, only three of them have taught engineering classes on a regular basis in the last four years. Hence I will only consider these two in answering the questions in this section about the program faculty.
- The engineering program has one full time faculty. His ethnicity is Asian.
- Of the three adjunct faculty, two (67%) are White. One (33%) is Asian
- The data provided in the booklet shows that the engineering program has a female adjunct faculty of Asian / Pacific Islander ethnicity. This is a mistake.

What evidence is there that faculty are staying current in their respective disciplines and instructional methodologies?

- The faculty attend departmental faculty development meetings and activities which address various aspects of instructional methodologies. Such meetings address such topics as the extent of student involvement doing problems in the classroom.
- The faculty keep up with advances of the technology and how it may be used in the classroom. We receive much information from textbook publishers about such technologies.
- One faculty member (C. D. Rao) attended as many as 14 faculty development activities offered here at ACC and UT. The topics of some of these are: Motivating students, multiple intelligences, teaching problem solving and improving classroom participation skills.

What recognition has been given to faculty within the last year?

None.

Describe professional development activities in which program faculty participate.

- The Department of Physical Sciences (which includes the engineering program) holds periodic (about 4 every school year) departmental

professional development meetings. The topics of such meetings include: discussion of curriculum, active learning, classroom demonstrations, laboratory computers, laboratory grading and format of lab reports.

- Two departmental faculty development seminars by a College counselor on how to recognize and help students in need of counseling whether due to school stress or due to family circumstances.
- One faculty development seminar on mathematics anxiety.
- I (Saad Eways) attended an informational meeting on ADHD students.
- All the faculty attend the annual Hazcom meetings sponsored by the College.
- All the faculty attend the annual departmental safety training sessions.
- All the faculty fulfill their obligations and attend the required number of hours of faculty development.
- Faculty development workshop on Hybrid Happenings. The subject of this workshop is classes which combine classroom presence of the student part of the time and his involvement in doing homework online or some other means which would not require classroom presence.
- Two of the faculty (Tom Bird and Milton Fagenbush) have taught mathematics classes regularly and have satisfied the faculty development activities required by the Math Department.
- One faculty member (C. D. Rao) attended as many as 14 faculty development activities offered here at ACC and UT. The topics of some of these are: Motivating students, multiple intelligences, teaching problem solving and improving classroom participation skills.

What percent (and the total number) of faculty participate in formal professional development activities on a regular basis?

- All of the faculty (4 or 100%) participate in formal professional development activities. Please refer to the answers to the two questions directly above for more detail.

Describe the types of discipline-related professional development activities offered.

- Please refer to the answer to the next to last question as it contains detailed information on all the professional development activities of the faculty including the discipline-related ones.

What percent of sections do full-time faculty teach?

Table (13): Number and percent of sections taught by full time faculty for the five-year period FY'99 – FY'03.

		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
Full Time	Number	1	6	6	4	4
	Percent	8.3%	46%	46%	36.4%	50%
Adjunct	Number	11	7	7	7	4
	Percent	91.7%	54%	54%	63.6%	50%

What percent of contact hours do full-time faculty teach?

Table (14): Number and percent of contact hours taught by full time faculty for the five-year period FY'99 – FY'03.

		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
Full Time	Number	1216	5888	3680	2640	2768
	Percent	17%	57%	52.5%	41%	52.4%
Adjunct	Number	7104	4448	3328	3744	2512
	Percent	83%	43%	47.5%	59%	47.6%



Are student evaluations of instruction within acceptable range? Yes No

To what extent are alternative modes of instruction incorporated into classes?

- Engineering courses are problem-solving courses. That is what engineering is: it is problem solving. The student study time should be spent on problem solving more than anything else. In recent years I have reduced the amount of time I spend on discussion in the classroom and gave that time to the student and asked him/her to solve problems in the classroom as I look over their shoulder. This allowed me to make corrections and give suggestions on problem solving. It also allowed me to identify the students who need my help and my time more than others. So my class would be described as a participation class, or active learning, instead of a lecture. This is a positive change without any question although there is nothing “alternative” about it.

- Alternative modes of instruction such as distance learning has not been incorporated in the engineering program.

- **Student Satisfaction**

Do student course evaluations demonstrate satisfaction with courses?

Yes X No

[f] Adequacy of program resources and efficiency of resource use

Describe the overall adequacy of resources (human, technological and capitol, facilities, and fiscal) available to the program for providing effective program delivery and outcomes.

- The fiscal resources of the engineering program are *woefully inadequate*. In FY04, the department's budget consists of \$ 206.00 for duplication and no money for anything else. How does the program survive? We survive on the mercy of the Physics Program. We use their computers, their supplies, their apparatus and their white board markers.
- I believe at this point human resources are adequate. The program has one full time faculty member and five adjunct faculty members listed on the eligibility list although only two of them teach on a regular basis.
- The program has no technological or capitol resources and is in need of a computer workstation dedicated to engineering student's use. Other technological items could be purchased when needed if the program had an annual equipment budget.

What is the ratio of full-time to adjunct faculty (by course and for the program overall)?

Table (15): Percentage of full-time and adjunct faculty for the engineering program.

	Full Time	Adjunct
Number and Percent	1 (25%)	3 (75%)

Table (16): Percentage of full-time and adjunct faculty for the engineering program by course.

Course	Full Time Number and Percent	Adjunct Number and Percent
ENGR 1201	1 (50%)	1(50%)
ENGR 2301	1(50%)	1(50%)
ENGR 2302	0(0%)	1(100%)
ENGR 2332	1(100%)	0(0%)

Important notes concerning the above table:

- ENGR 2332 is taught only in the Fall semester by a full time faculty.
- ENGR 2302 was not offered for many years. It was offered again recently in Spring '01 and Spring '02 and was taught by an adjunct faculty. It was offered but did not make in Spring '03 and has not been offered since then.

How up-to-date is the equipment used by the program?

- As far as classroom equipment, the engineering program has none. We borrow from the physics department any kind of demonstration apparatus we use. If it was not for the physics department and all the apparatus we borrow from them, this program could not exist since we have no budget!
- We have asked in previous years for a computer workstation. It would be used by the students taking the various engineering classes to work on projects. Needless to say we received nothing.
- The program needs a modest annual budget to purchase supplies and apparatus. This would improve the quality of instruction in all our classes.

Identify possibilities for improving the efficiency of the program's use of resources.

- In the last four to five years, the number of sections offered by the engineering program has decreased from 13 in FY 2000 to 8 in FY 2003. This is a decrease of nearly 40%.
- The number of students taking engineering classes has also decreased from 234 in FY 2000 to 138 in FY 2003. This is a decrease of 41%. Simple

arithmetic would show that the average number of students per section is held steady at 18. The cancellation of sections did not result in improved efficiency.

- The reason for the decrease in both sections offered and student enrollment is that if a section is cancelled due to low enrollment in one semester, this section is dead forever and is not reinstated in the course schedule for the same semester the following year. The College has made it very difficult to resurrect a cancelled section. The effect such a rule has on a large department or program may not be noticeable. But the effect on a small program offering only 10 sections for the entire academic year is drastic and in our opinion quite negative. The College must either change this rule or give some special allowances to small programs like engineering to roll over cancelled sections.
- We would like to propose recruiting students by making contacts with local high schools and ensuring that students know about the engineering program at ACC.

[g] Comparison of program performance, price, and enrollment with that of alternate local suppliers

How is the program competitive with similar programs offered by other institutions or schools in the service area in terms of performance, cost to students, and enrollments?

Table (17): Comparison of cost to the student of a 3-credit course among some institutions and schools in Texas.

Institution	Cost for a 3-hour course (Dollars)
Austin Community college	159
Houston Community College	147
San Jacinto College	239
Texas State University –San Marcos	682
University of Phoenix (Online)	1380
University of North Texas	701
Texas Southern University	721
Trinity University	2679
University of Texas at Austin	743

[h] Direct and indirect program-related revenues and costs to the College

Identify the major sources of revenue for the program, including grants, partnerships, etc.

- The sources of revenue for the program are
 - a) State funding and
 - b) Tuition revenue.

Compare program costs to those of other ACC programs.

- In real terms, the cost of the program is much less than the College data indicate. The salary of the one full time faculty in the program makes up the largest portion of the budget. The full time faculty member teaches the engineering courses at RGC. This usually amounts to 1/3 of his LEH load per semester. For the other 2/3 of his load he teaches physics classes. Therefore only 1/3 of this full time faculty salary is a direct expense of the engineering program.
- Comparing direct revenue vs. direct expenses with other programs at ACC, the engineering program is somewhere in the middle. In fact if the point explained above is taken into consideration, the engineering program breaks even.
- The engineering program has no other expenses other than faculty salaries.

Compare the program's actual expenditures to the approved program budget for the previous two years.

- The engineering program's actual expenditures are much less than the approved program budget. The explanation is given above.
- The budget figures given in the booklet for the engineering program for FY '03 and FY '04 are not correct. This is due to the usual mix up between our program and the work force engineering programs such as engineering technology and engineering design graphics. This happens often and ends up showing a very inflated and erroneous engineering program budget. For reference, the budget figures for FY '02 seem reasonable and therefore I will assume they are accurate.

TRANSFER or WORKFORCE AREA-SPECIFIC INFORMATION

Only Workforce Programs complete the items below.

Report/status from latest external accrediting agency visit

██████████

When was the most recent program revision?

██████████

Number of declared majors intending to complete a program who complete degree/certificate requirements within 6 years

██████████

Average number of semesters it takes for students to gain degree/credential.

██████████

Number of graduates within the last three years

██████████

Demographics of graduates

██████████

Percent of graduates who are employed within one year of graduation.

██████████

What evidence exists that program completers (or near completers) are successful on the job? What, if available, are their beginning salaries?

██████████

Percent of employers indicating satisfaction with graduates.

██████████

Discuss the most recent results of Focus Group or internal survey of employers.

██████████

Number of employers indicating need for more graduates

██████████

Provide evidence of SCANS competency integration into course syllabi and programs.

██████████

How often does the program's advisory committee meet to discuss curriculum issues?

██████████

When and where are advisory committee minutes maintained and posted?



Evidence of recent review of curriculum by external advisory committee.



Advisory committee validation of entry level skills



Only Transfer Programs complete the items below.

Number and percent of graduates who transfer within one year of graduation.

- The data to answer this question are not available.



Number of articulation agreements with universities and colleges.

- The number of articulation agreements with colleges and universities according to the ACC website is 19.
- As explained in other places in this report, the courses offered by the engineering program (except ENGR 1201) are standard engineering courses and are accepted for transfer to almost all universities in the country. The courses have the same subject matter and taught similarly as they would be taught anywhere else. Certain universities may need more documentation before they accept one of our courses for transfer. Such documentation would be in the form of a course description, a syllabus or the instructor's list of topics covered in the course. When this information is provided to them, they usually accept the course for transfer.
- The exception is ENGR 1201, Introduction to Engineering. This is not a standard engineering course. It transfers to UT, which is the destination of the majority of our students, as 2 credit hours of science elective. The Introduction to Engineering classes offered at UT are 3 semester credits. Our course is 2 credits.



Number of courses that transfer

- Three of our four courses transfer to 4-year colleges and universities. They have equivalent courses taught at these schools since they are an integral part of most of the engineering curricula.

- The fourth course, ENGR 1201, Introduction to Engineering, transfers to some universities but not all. UT for example gives ACC students 2 engineering elective credit hours. The Introduction to Engineering class is taught now at almost all colleges and universities but there is no universal agreement among them on what should be taught in this course. This is the reason why this class does not transfer without questions asked.

Number of student complaints about problems with course transfer

- We get no complaints about our courses not transferring.
- We have had two requests from former students to send course syllabi to the universities with whom we do not have articulation agreements. The courses were accepted for transfer when these universities received the syllabi.

Discuss the results of the most recent Survey/focus group of transfer institutions.

- No survey was conducted.

Discuss data from transfer institutions if available.

- The majority of engineering students at ACC want to transfer to UT Austin. In fact they make up the largest group of transfer students at UT.
- Over a five-semester period ending with Spring 2003, 198 ACC students have transferred to the UT College of Engineering. The next largest group of transfer students (count 38) came from North Harris Montgomery Community College.
- Generally, ACC students transferring to engineering programs at UT do as well as UT engineering students. Their average GPA is approximately 3.0 while the average GPA in engineering at UT is approximately 3.1.

Number of students transferring successfully.

- Other than the transfer information contained above about ACC engineering students transferring to UT Engineering, we have no comprehensive data showing the numbers of ACC engineering transfer students and the 4-year institutions they transfer to.

CONCLUSIONS

Based on the information collected and analyzed during the program review process, what are the major conclusions of this review of the program? Summarize them here and complete the *Program Status* form.

- **The engineering program performs an excellent service to its students** preparing them either to transfer to 4-year engineering programs or jump into the work force and qualify for higher paying professional positions.
- **The courses are up to date and cover standard material that is an integral part of the engineering education.** The exception is ENGR 1201 which will be upgraded in the next year by adopting a list of required topics and course objectives.
- **The program offers three courses on a regular basis: ENGR 1201, ENGR 2301 and ENGR 2332.** The first two are required for the Associate of Science degree in Engineering. The third is a suggested technical elective.
- **ENGR 2302 needs to be offered on a regular basis once a year in the Spring semester as agreed upon.**
- **We believe the teaching in all the engineering courses is competent and the students get the necessary preparation.**
- **The engineering program has lost sections and enrollment in the last five years.** Cancelled sections must be reinstated in the subsequent semesters. The engineering program is a very small program by nature and such a rule is detrimental to the growth of the program.
- **The engineering program is in good shape now** and all the planned steps for improved retention, increased sections and enrollment should put the program in an excellent position.
- **The engineering program is underfunded** and funding must be established by approving a supplies budget.



PROGRAM VISION STATEMENT

State the program's vision or preferred future for the next five years. The vision statement should provide direction to the program as it makes improvements to enhance its effectiveness and efficiency.

- The vision of the engineering program is to provide an expanded pipeline into the world of professional engineering for underprepared and underrepresented students in the Austin Community. The program will recognize that some of those students will progress directly into the workforce and others who are already in the workforce aim to gain immediate promotion to managerial positions. The vast majority of our students aspire to transfer to four-year institutions to complete a baccalaureate degree in one of the engineering disciplines. The engineering program recognizes its crucial role in preparing these aspiring engineering students and beginning engineers and will strive now and more so in the future to make their experience a more successful one.
- The vision of the program also includes a steady increase in the number of sections offered and the number of students enrolled in engineering classes. Specifically, for the next 5 years, the engineering program aspires to reach 4 sections of ENGR 1201 and two sections of ENGR 2301 offered per semester. Also one section each of ENGR 2302 (Spring) and ENGR 2332 (Fall).
- The program will continue to do its best to prepare our students the best way possible by offering them an excellent engineering education.

RECOMMENDATIONS

What does the self-study team recommend for improving or maintaining the quality of the program? Summarize the recommendations here and complete the *Quality Improvement Plan* form.

1. **We recommend that the program be given an annual supplies budget to purchase items needed in teaching the engineering courses.** An annual budget of \$1000.00 is suggested initially with a 10% annual increase for the next five years.
2. **We recommend increasing section offerings** including offering ENGR 2302 on a regular basis. This will increase enrollment. The ramping up should be deliberate and gradual as proposed in the planning issues described above.
3. The retention rates are well within College limits. **We recommend approving the proposed recitation sessions to improve student retention and success.**
4. **We recommend strict enforcement of prerequisites.**
5. **We recommend the establishment of closer ties with Austin area engineering firms and other institutions along common goals.**

ADDITIONAL COMMENTS



APPENDIX

List all documents that you used in your report.

When you have completed this report, send it via e-mail to the Coordinator for Institutional Assessment (rwall@austincc.edu) as an attachment.

Quality Improvement Plan for the Engineering Program

Date Completed: 2/14/05

Please complete a table for each of the self-study team's recommendations for improving or maintaining the quality of the program. The first table provides information to assist you in determining what to put in each "cell." If you need more tables, please use the copy/paste function in word.

Field	What to include
Recommendation #	Assign a number to this recommendation for tracking purposes.
Recommendation:	Taken from the <i>IPRS</i>
Planned Implementation date:	When does the program expect to begin to implement this recommendation?
Estimated Completion date:	When does the program estimate this recommendation to be fully implemented?
Action/Task	What steps must the program do to implement the recommendation?
Measure of Success/ Desired Outcome	If the recommendation is implemented, what about the program will be improved? What difference will the implementation of this recommendation make in relation to students, the program's purpose, the College's mission? How will this recommendation improve learning and help meet targeted objectives?
Estimated Cost(s)	This field is particularly important because the information the program enters here is the information that the Instruction/credit Cluster Group will consider in its Master Plan process. Consider changes that require one-time costs (equipment, renovation, etc.) and changes that require recurring costs (typically new positions).
Consequence if not funded	If this recommendation is not funded, how will students, the program, the College, or the community be negatively impacted?

Recommendation #	1
Recommendation:	We recommend that the program be given an annual supplies budget to purchase items needed in teaching the engineering courses. An annual budget of \$1000.00 is suggested initially with a 10% annual increase for the next five years.
Planned Implementation date:	FY '06
Estimated Completion date:	No completion date
Action/Task	The Department Chair and the Dean will ask through the proper budget channels for a supplies budget to be established for the engineering program.
Measure of Success/ Desired	Improvement in the quality of instruction especially

Outcome	for ENGR 1201 where apparatus can be purchased for hands-on student projects.
Estimated Cost(s)	\$1000.00 initially with a 10% annual increase for the next 5 years.
Consequence if not funded	<ol style="list-style-type: none"> 1. ENGR 1201 will continue to lack a hands-on student project which will negatively impact the quality of the course. 2. Inability to purchase items needed for instruction such as video, demonstration apparatus, etc would negatively impact the engineering courses and reduce the chance of students achieving greater academic success.
Who is responsible?	The Department Chair

This recommendation is justified by the data. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications [REDACTED]
The Action/Task is appropriate to achieve the program's goals. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications [REDACTED]
The costs specified are justified by the program data, goals, and strategies. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications [REDACTED]

Recommendation #	2
Recommendation:	We recommend increasing section offerings including offering ENGR 2302 on a regular basis in the Spring semester of each year. This will increase enrollment. The ramping up should be deliberate and gradual.
Planned Implementation date:	Spring '06
Estimated Completion date:	Annually
Action/Task	<ol style="list-style-type: none"> 1. Get the approval to offer ENGR 2302 for Spring '06 and get it in the course schedule. 2. Work to advertise the course to give it the needed boost in enrollment. 3. Study the enrollment trends in the other courses in order to decide when and where the new sections should be offered.
Measure of Success/ Desired Outcome	<ol style="list-style-type: none"> 1. Increased section offerings and increased enrollment. 2. Give our students the opportunity to take Dynamics at ACC rather than other colleges and universities.

	3. A more diverse course offerings in the engineering program.
Estimated Cost(s)	None, in fact it may generate revenue.
Consequence if not funded	Not much funding (if any) is required for this initiative. If not approved, the engineering program will not be able to meet the educational needs of it's students.
Who is responsible?	The Department Chair.

This recommendation is justified by the data. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications
The Action/Task is appropriate to achieve the program's goals. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications
The costs specified are justified by the program data, goals, and strategies. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications

Recommendation #	3
Recommendation:	We recommend approving recitation sessions to improve student retention and success.
Planned Implementation date:	Fall '05
Estimated Completion date:	No completion date. This will be done on a regular basis.
Action/Task	<ol style="list-style-type: none"> 1. 90-minute recitation sessions will be scheduled every Friday for the duration of the semester. These will be problem-solving sessions helping the student with homework or preparing for the exams. 2. Recitation sessions are regular offerings in engineering programs at 4-year universities for the purpose stated above.
Measure of Success/ Desired Outcome	<ol style="list-style-type: none"> 1. A more thorough coverage of the required material. 2. Improved student success and improved retention.
Estimated Cost(s)	\$1000.00 per semester.
Consequence if not funded	The students learning experience will be severely hampered, with our non-traditional students being placed at the greatest risk.
Who is responsible?	Saad Eways

This recommendation is justified by the data.	Comments/Modifications
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<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
The Action/Task is appropriate to achieve the program's goals. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications
The costs specified are justified by the program data, goals, and strategies. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications

Recommendation #	4
Recommendation:	We recommend strict enforcement of prerequisites
Planned Implementation date:	Fall '05
Estimated Completion date:	No completion date. This will be done on a regular basis.
Action/Task	<ol style="list-style-type: none"> 1. Publish prerequisites in the course schedule right above course offering. 2. State that course prerequisites are mandatory and instructors will verify.
Measure of Success/ Desired Outcome	<ol style="list-style-type: none"> 1. Improved success and retention since students enrolled will have the prerequisite courses. 2. This may reduce enrollment. But those enrolled in a class without the prerequisites have little chance of doing well in that class.
Estimated Cost(s)	None.
Consequence if not funded	No funding is needed. The program will move to enforce prerequisites.
Who is responsible?	The Department Chair
This recommendation is justified by the data. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications
The Action/Task is appropriate to achieve the program's goals. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Comments/Modifications
The costs specified are justified by the program data, goals, and strategies. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Comments/Modifications: Course prerequisites should be listed in the catalog. There is a cost associated with duplicating those prerequisites in the course schedule. The department has not made an adequate case that this added cost is justified.

Recommendation #	5
Recommendation:	We recommend the establishment of closer ties with Austin area engineering firms and institutions along common goals.
Planned Implementation date:	Spring '05 (in progress).

Estimated Completion date:	No completion date. This will be done on a regular basis.
Action/Task	We will continue to establish ties with engineering firms to exchange ideas and increase cooperative efforts.
Measure of Success/ Desired Outcome	<ol style="list-style-type: none"> 1. Guest lecturers in engineering classes such as ENGR 1201 from private corporations talking about their engineering projects. 2. The community at large will learn more about the College and the engineering program. 3. Possible placement of students as summer interns with some of the engineering firms.
Estimated Cost(s)	None.
Consequence if not funded	No funding is needed.
Who is responsible?	Saad Eways

<p>This recommendation is justified by the data.</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	Comments/Modifications
<p>The Action/Task is appropriate to achieve the program's goals.</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	Comments/Modifications
<p>The costs specified are justified by the program data, goals, and strategies.</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	Comments/Modifications