



Instructional Program Review Saddleback College Astronomy

March 22, 2005

Program: Astronomy

Division: Math, Science and Engineering

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Table of Contents

1.0 Overview	3
1.1 College Mission and Goals	3
1.1.1 Mission Statement	3
1.1.2 Goals.....	3
1.2 Math, Science, and Engineering Division Goals	4
1.3 Astronomy Program Goals.....	5
1.4 Unique Characteristics.....	5
1.5 Program Statistics.....	6
1.6 Recommendations	6
2.0 Program Review	9
2.1 Curriculum.....	9
2.2 Instruction	10
2.3 Student Success	12
2.4 Staffing and Resources.....	12
2.5 Staff Development	14
2.6 Community Outreach and Articulation	14
2.7 Accreditation	15
3.0 Astronomy Program Statistics.....	16
Appendix 1 - Access and Productivity.....	18
Appendix 2 - Success and Satisfaction.....	20
Appendix 3 - Student Characteristics.....	24

1.0 Overview

The mission of the South Orange County Community College District requires a systematic review of the Astronomy Program to ensure quality and relevance, and the effective use of resources. This program review is used for making judgments about the effectiveness of the program and to improve student learning. It is a means of ensuring that the Astronomy Program is effective and responsive to the local college community.

The results of the Astronomy Program review will be incorporated into the strategic planning process. This program review will also support the WASC accreditation standards, interface with the college Enrollment Management Plan and most importantly, provide information for program planning and improvement

This document includes an overview of the Astronomy Program and key recommendations. The overview starts with the mission and goals of Saddleback College, the Math, Science and Engineering (MSE) Division, and the Astronomy Department. The main document describes and provides recommendations for the: curriculum, instruction, student success, staffing and resources, staff development, community outreach, and articulation and accreditation.

1.1 College Mission and Goals

1.1.1 Mission Statement

To provide access to learning opportunities that promote student success; to foster intellectual growth, individual expression, and character development; and support a dynamic environment of innovation and collegiality

1.1.2 Goals

The primary goal of Saddleback College is to provide a comprehensive post secondary education and a full range of student services. Emphasis is placed on open access to all students, including a changing and diverse student population. Academic success and student achievement are joint responsibilities of the students, the staff, and the college. To this end, the college will:

- 1.1.2.1 Provide educational programs leading to the Associate in Arts and Associates in Science Degrees.
- 1.1.2.2. Provide a comprehensive, broad range of high quality courses and programs to enable students to pursue their educational objectives and career goals.
- 1.1.2.3. Provide a meaningful general education program including baccalaureate-level transfer and occupational curricula.
- 1.1.2.4. Provide necessary developmental, remedial, and basic skills instruction so that students may be successful in their chosen course of study.

- 1.1.2.5. Provide access for the community to the educational, cultural, and recreational resources of the college.
- 1.1.2.6. Provide counseling and other support services which are responsive to the needs of students.
- 1.1.2.7. Provide opportunities in continuing education and community services, including courses for skill upgrading, retraining for professionals, and life long learning for older adults.

1.2 Math, Science, and Engineering Division Goals

To instruct and inspire all students in rigorous, high quality post-secondary education in lower division courses in mathematics, science and engineering with a vision for tomorrow.

- 1.2.1 Review and revise, as necessary, the division Mission Statement.
- 1.2.2 Facilitate and implement retention and enrollment management with a focus on outreach, student success, access, increased productivity, growth, higher WSCH/FTEF and sound course management.
- 1.2.3 Increase student enrollment and retention in distance education classes, including classes offered in a hybrid instructional mode where appropriate.
- 1.2.4 Initiate program review per established process, instrument(s) and timeline with a focus on improving student learning outcomes, persistence, retention and student success.
- 1.2.5 Increase student transfer rate.
- 1.2.6 Provide division resources for the completion and submission of the accreditation self-study.
- 1.2.7 Improve internal and external communication.
- 1.2.8 Recommend, monitor and complete new construction and renovation of college facilities per the Five-Year Facilities and Master Plan including a new Science-Math Building.
- 1.2.9 Participate in needs assessments and discussions of programs, services and uses for new educational sites.
- 1.2.10 Provide increased administrative, technological and maintenance support and services to students and the departments by prioritizing expenditures.
- 1.2.11 Improve respect, consideration of and sensitivity for diverse groups and perspectives.
- 1.2.12 Manage and maintain board-approved budget to reach division and college goals.

1.3 Astronomy Program Goals

- 1.3.1 Provide quality lower-division lecture/laboratory based courses for transfer students in Astronomy and Astrophysics. Related to College goals 1.1.2.1, 1.1.2.2, 1.1.2.3, 1.1.2.7.
- 1.3.2 Provide general education courses in Astronomy for students of all majors. We offer an Astronomy 20, 21, 25, 45 and 130 course that can be taken by any student; the courses have no prerequisite requirements. Related to College goals 1.1.2.1, 1.1.2.2, 1.1.2.3, 1.1.2.7.
- 1.3.3 Increase student retention rate and transfer rate to universities by offering quality instruction with a diverse schedule. Related to College goals 1.1.2.1, 1.1.2.2, 1.1.2.3, 1.1.2.5, 1.1.2.7.

1.4 Unique Characteristics

The Saddleback College Astronomy Program offers general education courses for science and non-science majors. The majority of students take Astronomy at Saddleback College to meet general education and IGETC requirements. In addition, students take Astronomy courses, not to meet an academic requirement, but to further their knowledge of Astronomy.

Saddleback offers unique Astronomy courses. The first unique course is Astronomy-25, Observational Astronomy. Students taking Observational Astronomy use school owned equipment to learn observational techniques. The course is a 3-unit laboratory course that meets 4 hours per week and includes 16.6 hour weekend field trip. Other 2-year colleges offer a 1-unit lab course to accompany the general Astronomy course which is equivalent to Astronomy 20 offered at Saddleback College. Saddleback College also offers three other unique Astronomy courses: Astrophotography (Astro-130), from Big Bang to Black Holes (Astro-45) and the Solar System (Astro-21).

Unlike the courses offered at major universities and other local 2-year colleges, Saddleback College offers small class sizes. As an example, the Astronomy courses offered at the UC and CSU campuses are large lectures with several smaller laboratory sections. The lecture sections, which can have up to 200 students, are given by professors. In many cases, the laboratory sections are administered by graduate students. At Saddleback College, we offer small laboratory sections. Our maximum enrollment is 28 students per section (Astronomy 25). The smaller class sizes allow the faculty members to focus on the individual learning objectives of the students. Many of our transfer students praise the quality of education they received at Saddleback.

The Astronomy Program has state-of-the-art equipment available to the students. Equipment is used by instructors for demonstrations and by students for hands-on instruction during the laboratory sessions. Students also have access to state-of-the-art observatory used primarily to study the Sun, Moon and Planets.

1.5 Program Statistics

The Astronomy Program statistics (year 2002 to 2004) are summarized in Table 1. Detailed data is supplied in the attached Appendix (Section 3). The data is divided into access and productivity, student success and student characteristics.

Access and Productivity – The access and productivity of the astronomy courses is excellent. Most astronomy courses close by the first census date. Astronomy has not experienced an increase in enrollment which is consistent with the overall trend at Saddleback College.

Student Success – The student retention rate in the courses is excellent. However, the number of students successfully completing courses is below average. This is primarily due to the success of Astronomy 20 students. Astronomy 20 is the first science course taken by several Saddleback College students. Some students are unable to cope with amount of work or the material. It should be pointed out that the student success rate in our Astronomy 25 course is over 80%.

Student Characteristics – A majority of our students are within Saddleback's geographic area. Approximately 10% of our students are from IVC or other zip codes.

1.6 Recommendations

Staffing - The Astronomy Program is staffed by highly competent professional full-time and adjunct faculty. The full-time Astronomy instructor retired in 2004. We are currently in the process of searching for a new replacement faculty member. In the meantime, adjunct and other full-time faculty members are teaching the Astronomy courses. Recruiting competent adjunct faculty is important and challenging (especially for day classes). We recommend continuing to interview and recruit adjunct faculty to facilitate near-term and potential long term growth in the program.

We recommend hiring the replacement faculty this semester. In the event the search committee does not find a qualified candidate, we recommend renewing the process in the 2005/2006 academic year.

Facility Improvements - The Astronomy course lectures and laboratories are taught in Science Math (sm) 101 and 104. These two laboratories require some renovation. Storage cabinets must be added to SM 101 and the older cabinets painted to match the balance of the room. Cabinets and unused furniture should be moved out of sm 104 to increase capacity. If possible, the cabinets in the rear of sm 104 should be removed to increase the capacity of the room. The current capacity of sm 104 is 60 students. Removing unused furniture will increase the capacity to about 75 students.

Our current supply budget is adequate because we transfer student help and repair funds into the supply account. Now that the college (equipment committee) no longer provides non-competitive funds for minor equipment items in the \$200-\$2000 range, we will have to use our supply budget to buy such items. This is having a substantial impact on our restocking purchases this year. We need reliable funding for purchases of minor equipment which is separate from our supply account.

Course Improvements – We recommend adding one section of Observational Astronomy in the fall semester. The demand for Astro-25 in fall has grown significantly over the past three years. We also recommend adding one distance education Astronomy 20 course. The Astro-20 distance

education course will be web based. Some members of the faculty and staff have stressed an interest in adding a one unit lab course to supplement Astro-20. However, not all members of the department agree with the one unit Astronomy course. The department will continuously evaluate the feasibility of adding the course.

Table 1. Summary of the Astronomy Program Statistics

	Benchmarks	2001/02	2002/03	2003/04
Access & Productivity				
Number Course Sections Offered	22 (Program)	21	21	22
C1 Duplicated Headcount		897	880	881
Average WSCH per FTE Faculty	525 (State)	592	633	623
Fill Rate (C1 Enrollment/Course Cap)	98% (Program)	101%	99%	94%
Average Enrollment per Section	41 (Program)	40	43	40
Reported (normalized) WSCH		3200	3264	3289
Success & Satisfaction				
Average Course Term Retention Rate	82.3% (College) 82.5% (State)	80	85	84
Average Successful Course Completion Rate	70.7% (College) 66.9% (State)	52	59	53
Number of Degrees & Certificates Awarded*	/ (Program)	NA	NA	NA
Student Characteristics				
Education Goal	Transfer	46%	48%	52%
	Upgrade Skills	11%	8%	8%
	Other	43%	44%	40%
Out-of-District Students	In District	91%	89%	88%
	Irvine/Tustin	2.4%	1.9%	2.7%
	Out-of-District	6.6%	9.1%	9.3%

* Only a few students have elected to apply for an AA/AS degree. Most students taking Astronomy are transfer students.

2.0 Program Review

2.1 Curriculum

Courses - Table 2-1 lists the courses offered in Astronomy, the date of the most recent course outline update, transferability of the courses to the UC and California State University systems and the degree support (what education requirements do the Astronomy courses meet?). Saddleback College offers an Associate of Science Degree in Astronomy.

Astronomy 20, 21 and 25 are general education courses that satisfy the Saddleback AA breadth requirement, IGETC and CSU (area B1) transfer requirements. Taking Astro-20 or Astro-21 and Astro-25 satisfies the laboratory science requirement. The transferability of the Astronomy courses is detailed in the Catalog of Classes.

Table 2-1 Astronomy courses offered at Saddleback College

Course	Course Outline Update Date	Degree Support and Transferability
Astronomy 20	Fall 2000	<ul style="list-style-type: none"> • AA General Education natural science breadth requirement; lab science requirement met when A-25 and A-20 courses are taken • AA degree Astronomy • IGETC area 5 (Lab course when A-20 and A-25 are taken) • CSU Area B1 (Lab course when A-20 and A-25 are taken) • UC transferable course
Astronomy 25	Fall 2000	<ul style="list-style-type: none"> • AA General Education natural science breadth requirement; lab science requirement met when A-25 and A-20 courses are taken • AA degree Astronomy • IGETC area 5 (Lab course when A-20 and A-25 are taken) • CSU Area B1 (Lab course when A-20 and A-25 are taken) • UC transferable course
Astronomy 130	Spring 2002	<ul style="list-style-type: none"> • Taken by members of the community for interest
Astronomy 45	Fall 2000	<ul style="list-style-type: none"> • IGETC area 5 • CSU Area B1 • UC transferable course
Astronomy 21	Fall 2000	<ul style="list-style-type: none"> • IGETC area 5 • CSU Area B1 • UC transferable course

Course Evaluation - The contents of each course are evaluated every five years and on an as needed basis. The curriculum is revised and sent to the curriculum committee for approval. Table 2-2 summarizes when each course was last reviewed.

Table 2-2 Astronomy Courses Review Dates

Course	Review Date
Astronomy 20	Fall 2000
Astronomy 25	Fall 2000
Astronomy 21	Spring 2001
Astronomy 45	Fall 2000
Astronomy 130	Fall 2000

The Astronomy courses at Saddleback do not require prerequisites. Astronomy 20 is a recommended preparation for Astronomy 25 and 45.

The faculty and chair of the Physics and Astronomy Department review the programs at the CSU and UC Universities. Saddleback College programs must be compatible with university undergraduate programs. In addition, the chair is in contact with the chairs of various related schools at UCLA, UCI, CSU Fullerton, CSU Northridge, CSU Long Beach, UC San Diego and CSU San Diego. Furthermore, the department chair works closely with the Saddleback College counselors.

The Astronomy courses have been articulated with all of the UC and CSU campuses. All accredited universities in the United States accept Saddleback College Astronomy courses.

Recommendations - We recommend adding one section of Observational Astronomy in the fall semester. The demand for Astro-25 in fall has grown significantly over the past three years. We also recommend adding one distance education Astronomy 20 course. The Astronomy 20 distance education course will be web based.

2.2 Instruction

Learning goals and objectives are documented in the course curriculum. In addition, each instructor lists learning objectives and goals in the course syllabus handed out the first day of class. The Astronomy faculty utilize a variety of methods to assess students and determine if learning objectives/goals are met. The methods include: weekly quizzes, exams, homework assignments, oral presentations, keeping of laboratory notebooks, and formal laboratory write-ups. Further details of our assessment methods are furnished in Section 2.3, Student Success.

The Astronomy Program strives to maintain the integrity of Saddleback College academic standards and achieve consistency in instruction amongst courses offered. The methods used to maintain academic integrity include:

- All faculty members follow the course outline as documented in the curriculum. The department chair and division dean have the responsibility of insuring that all faculty follow the curriculum.
- For the most part, all of the Astronomy faculty members use the same assessment tools. In the lecture course, grades are based on three to four multi-chapter exams, weekly quizzes, and assignments. The Observational Astronomy and Astrophotography course (both are considered laboratory courses) grades are based on a midterm and final exam, formal laboratory write-ups, and homework assignments.

Astronomy faculty members are encouraged to use and experiment with new and innovative teaching methods. Faculty members have the opportunity to attend various conferences and workshops on Astronomy education. In addition, new teaching tools are obtained from the textbook publisher. New and innovative teaching methods are discussed at the department meetings or via conversations between faculty members.

Technology is widely used in all of our Astronomy courses. The most abundant use of technology is in the laboratory section of the course. Students have access to laptop computers and state-of-the-art laboratory equipment. As an example, students use Schmidt Cassegrain 8-inch aperture telescopes to perform observation astronomy laboratories. In addition, students have the opportunity to use CCD cameras and other diagnostic equipment.

Technology is used as an instructional aid in the lecture portion of the Astronomy courses. The two rooms used by Astronomy (sm 101 and 104) are equipped with a computer, overhead projector, laser disc players and VCRs. The computers are used to: 1) display Power Point presentations, 2) demonstrate various Astronomy concepts by using animation software available from the publishers, 3) demonstrate the use of common data analysis software like excel, and 4) access and display various interactive web sites available to Astronomy instructors.

The Internet is used extensively. Laboratory write-ups and material is posted on the Astronomy web page for students to access. The web page is updated frequently by the department instructional assistant.

The Astronomy class schedule is adjusted to maximize enrollment and productivity within the constraints of available classrooms (Table 2-3). Every attempt is made to offer courses during the most desirable time slots. As an example, the optimum time during the week to offer the lecture courses is between 9 a.m. and 12 Noon. Astronomy 25 and 130 are offered at night. To accommodate students taking other courses that meet two nights a week (MW or TTH), Observational Astronomy is offered on M and T nights.

To facilitate learning outside the classroom, Astronomy students are encouraged to join the Astronomy and Physics Club and attend club functions. The club meets once every month during the semester. At each club meeting, an Astronomy talk is given by an invited speaker. In addition, the club takes trips to various observatories and industrial laboratories. In 2003/2004, the club is visiting the Palomar Observatory, General Atomics, Mt. Wilson Observatory, and the Jet Propulsion Laboratory.

Table 2-3 Astronomy Program Scheduling Strategy

Course	Schedule	Comments
Astronomy 20	- Primetime day slots (9-12 a.m. for lecture) - Nights and Friday	- Facilitate mainstream students and students with daytime jobs
Astronomy 25	- Nights (Monday and Tuesday night)	- Two section are typically offered each semester
Astronomy 45	- Prime day slots (9-12 a.m. for lectures)	- Due to limited enrollment Astronomy 45 is only offered every other year
Astronomy 130	- Nights	- Due to limited enrollment Astronomy 130 is offered every other year
Astronomy 21	- Offered at various times	- One course is offered in Spring

Recommendations – the following recommendations are made to improve the Astronomy program instruction:

- Add courses to facilitate enrollment growth (if necessitated by increased enrollment).
- Continue the same quality of instruction which has allowed the Astronomy Program at Saddleback to excel.
- Add a third section of Astro-25 in the fall.
- Add a distance education (web based) Astro-20 course.

2.3 Student Success

Most students taking astronomy courses at Saddleback have very little math or science background. Some students are challenged by the relative difficulty of the Astronomy 20 course. Every effort is made by the faculty members to encourage and motivate such students. To improve student success faculty members perform the following functions:

- In Astronomy 20, the students are given an assessment exam to gauge the preparedness of the students.
- Several assessment tools are used to monitor the progress of students. These assessment tools include: weekly quizzes, exams, homework assignments, and laboratory write-ups. The weekly quizzes are especially helpful in tracking student success.
- Faculty actively counsel students to seek outside help when necessary. Other than seeking help during office hours, faculty encourage students to seek additional help from the Learning Assistance Program (LAP).

All Astronomy courses (except for Astro-130) are fully transferable to universities. Our program is compatible with all universities in the United States. Furthermore, to accommodate part-time students who have full-time jobs during the day, we offer night and Saturday courses.

Recommendations:

- Add Astronomy tutors at the LAP. The LAP is a vital resource used by Saddleback College students.

2.4 Staffing and Resources

The Astronomy program has an adequate number of full-time instructors (assuming that a replacement faculty member is hired in 2005) to support the current level of course offerings. There will be 1.5 full-time Astronomy instructors (after the hiring). The load of one instructor, Dr. Mitch Haeri, is split between Physics and Astronomy. Nine courses are taught by full-time faculty, and five Astro-20 courses are taught by adjunct faculty (based on the 2003 schedule before the retirement of Dr. Yong Kim).

The Physics and Astronomy Department is supported by two classified staff members: an Astronomy instructional assistant and a Physics senior laboratory technician. The Astronomy instructional assistant is a part time position (20 hours per week) supporting all of the astronomy courses. The astronomy instructional assistant maintains the Physics and Astronomy web pages. The Astronomy instructional assistant's responsibilities are: 1) ordering new equipment and supplies, 2) managing the Astronomy supply and equipment budgets, 3) setting up demonstrations, 4) supporting the laboratories, and 5) maintaining the equipment. The Astronomy instructional assistant may occasionally use student help.

The total amount of hours allocated to the Astronomy instructional assistant is inadequate. The allocated hours do not cover the current workload let alone leave room for growth in the program.

All of the Astronomy courses are taught in SM 101 and 104. SM 101 is used for Astro-25 and SM 104 is used for Astro-20 instruction. SM 104 is a large lecture classroom capable of seating 60 students.

The department has acquired new equipment through capital expenditures over the past three years. Our supply budget is adequate because we transfer student help and repair funds into the supply account. Now that the College (equipment committee) no longer provides non-competitive funds for minor equipment items in the \$200-\$2000 range, we will have to use our supply budget to buy such items. This is having a substantial impact on our restocking purchases this year. We need reliable funding for purchases of minor equipment which is separate from our supply account.

The Astronomy students occasionally form study groups. The study groups meet in the library, in the science math foyer, LAP or other available rooms on campus.

Recommendations

- Hire a replacement faculty member this semester (Spring 2005). In the event the search committee does not find a qualified candidate, we recommend renewing the process in the 2005/2006 academic year.
- Immediately hire new faculty members in the event of retirements or sabbaticals.
- Increase the supply budget over the next five years. Except for an inflationary increase, this recommendation is contingent on sustainable growth. Provide additional funding for equipment replacement.
- Actively recruit and hire new qualified adjunct faculty.
- Install three high-end computers in SM 101 and 104. Currently, we have one Pentium 1 computer in SM 101. The students use the computers to print laboratories, access various web sites and perform demonstrations; there are not enough new computers in each room.
- The Astronomy instructional assistant hours must be increased to 40 hours.

2.5 Staff Development

The full-time faculty stay current in their respective disciplines and instructional methodologies. Faculty members read the latest technical journals (e.g. Astronomy, Sky and Telescope, and other Astronomical journals) to keep current on recent discoveries in Astronomy. Additionally, faculty members attend conferences to keep current on state-of-the-art teaching techniques. The Astronomy faculty are in contact with the publishers who furnish us with new books and software for review.

The Astronomy program is enriched by the outside activities of full-time and adjunct faculty. Expertise obtained from the aerospace industry is introduced into the classroom. Over the past 19 years, Dr. Haeri has also worked for a major aerospace corporation. Dr. Haeri has published over 42 papers in the fields of Engineering and Physics. In addition, Dr. Haeri has over five patents.

Our adjunct faculty also introduce new ideas from other colleges and industries. Bob Sackett routinely attends conferences and observing sessions at various national observatories. Steve Schuh enriches the program by introducing new ideas from other 2-year colleges and Dr. Jim Repka, Geology professor, teaches Astronomy 21.

Recommendations

- Most professional development conferences are held in other states for about one week. The travel costs can exceed \$1000. To encourage faculty to attend these worthwhile conferences and workshops, the college needs to provide adequate funding.

2.6 Community Outreach and Articulation

The Astronomy program offers courses suitable to majors in various fields. Our program must be commensurate with programs offered at universities. The department chair communicates with the engineering chairs at UCI, CSU Long Beach, CSU Fullerton, and UCLA to make sure our program is compatible with that offered at the aforementioned universities. In addition, the department chair, when possible, sends flyers to universities advertising our program as an alternative for students wishing smaller sections and more personal interaction.

The Physics and Astronomy Department participates in Saddleback's yearly high school recruitment events (senior day and family night). At senior day, the department hosts a table, sets up telescopes, and answers questions from local high school students.

The Astronomy faculty and staff routinely host public viewing sessions on campus, provide observing programs to local high schools and elementary schools, and host various events for Cub and Boy Scout groups. In the 2004/2005 academic year, 3 local high schools used Saddleback's facilities to augment their Astronomy programs.

The Astronomy instructional assistant has built and maintains a professional web page for Astronomy. The web page is routinely accessed by community members seeking information or to just view images taken from Saddleback's solar observatory.

Recommendations

- Update the Astronomy Program brochure.

- Encourage faculty members to visit local high schools and give presentations on the Astronomy Program offered at Saddleback College.
- Increase the number of public viewing session to at least one per semester.
- Maintain a professional web presence

2.7 Accreditation

The recommendations shown below were extracted from the accreditation 2001 mid-term report. Only a few of the recommendations are tangentially applicable to the Astronomy Program

- Academic Honor Code and Dishonesty Policy and the Recommended Range of Sanctions and Disciplinary Actions will be published on the College's Web site.

- All Astronomy faculty refer students to the published Academic Honor Code and Dishonesty Policy.

- The college will conduct program reviews following the schedule established by the Academic Senate.

- The Astronomy Program is currently under review.

- The college will recommend to division deans that division meetings regarding financial decisions include classified staff.

- All classified staff are invited to and regularly attend Astronomy program reviews.

3.0 Astronomy Program Statistics

The Astronomy Program statistics (year 2002 to 2004) are summarized in Table 3-1. Detailed data is supplied in the attached Appendices. The data is divided into access and productivity, student success and student characteristics.

Access and Productivity – The access and productivity of the astronomy courses is excellent. Most astronomy courses close by the first census date. Astronomy has not experienced an increase in enrollment which is consistent with the overall trend at Saddleback College.

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Student Characteristics – A majority of our students are within Saddleback's geographic area. Approximately 10% of our students are from IVC or other zip codes.

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	Other	43%	44%	40%
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	Irvine/Tustin	2.4%	1.9%	2.7%
	Out-of-District	6.6%	9.1%	9.3%

* Only a few students have elected to apply for an AA/AS degree. Most students taking Astronomy are transfer students.

Appendix 1 - Access and Productivity

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ENROLLMENT SUMMARY REPORT BY DIVISION/SCHOOL, DEPARTMENT, PROGRAM, AND SUBJECT**Saddleback College**

COMPARE FALL 2003 TO PREVIOUS FALL TERMS (END-OF-TERM DATA)

Excludes Cancelled, Industry & Grant-Funded Classes, Indep Study (except Rad & Med), Cosmetology, Co-Op Work Exp., IVC Honors, & Tutoring

DIVISION/SCHOOL: **Math, Science and Engineering**DEPARTMENT: **Physical Sciences**

<u>YR</u>	<u>TOI</u> <u>SECS</u>	<u>CTR</u> <u>WFCH</u>	<u>OL</u> <u>WFCH</u>	<u>LL</u> <u>WFCH</u>	<u>PT</u> <u>WFCH</u>	<u>EXC</u> <u>WFCH</u>	<u>TOI</u> <u>WFCH</u>	<u>TOI</u> <u>FTE</u>	<u>CRS</u> <u>CAP</u>	<u>EST</u> <u>ENRL</u>	<u>C1</u> <u>ENRL</u>	<u>CUR</u> <u>ENRL</u>	<u>RPT</u> <u>ENRL</u>	<u>CURRENT</u> <u>WSCH</u>	<u>RPT</u> <u>WSCH</u>	<u>WSCH</u> <u>FTE</u>	<u>ENR</u> <u>WFCH</u>	<u>ENRL</u> <u>SEC</u>
PROGRAM: Astronomy																		
SUBJECT: Astronomy																		
03	10	20	0	6	14	0	40	2.62	430	506	482	319	482	1,071	1,921	733	12.1	48.2
02	10	20	0	6	14	0	39	2.55	430	506	453	293	453	963	1,707	669	11.6	45.3
01	11	25	3	5	11	0	44	2.85	450	493	417	271	417	907	1,643	576	9.5	37.9
ASTRONOMY PROGRAM TOTALS:																		
03	10	20	0	6	14	0	40	2.62	430	506	482	319	482	1,071	1,921	733	12.1	48.2
02	10	20	0	6	14	0	39	2.55	430	506	453	293	453	963	1,707	669	11.6	45.3
01	11	25	3	5	11	0	44	2.85	450	493	417	271	417	907	1,643	576	9.5	37.9

ENROLLMENT SUMMARY REPORT BY DIVISION/SCHOOL, DEPARTMENT, PROGRAM, AND SUBJECT

Saddleback College

COMPARE SPRING 2004 TO PREVIOUS SPRING TERMS (END-OF-TERM DATA)

Excludes Cancelled, Industry & Grant-Funded Classes, Indep Study (except Rad & Med), Cosmetology, Co-Op Work Exp., IVC Honors, & Tutoring

DIVISION/SCHOOL: Math, Science and Engineering

DEPARTMENT: Physical Sciences

YR	TOT SECS	CTR WFCH	OL WFCH	LL WFCH	PT WFCH	EXC WFCH	TOT WFCH	TOT FTE	CRS CAP	EST ENRL	C1 ENRL	CUR ENRL	RPT ENRL	CURRENT WSCH	RPT WSCH	WSCH FTE	ENR WFCH	ENRL SEC
PROGRAM: Astronomy																		
SUBJECT: Astronomy																		
04	12	28	0	1	12	0	41	2.67	505	581	399	249	399	839	1,368	512	9.7	33.3
03	11	23	0	3	14	0	40	2.61	460	491	427	327	427	1,073	1,560	598	10.7	38.8
02	10	23	0	4	11	0	38	2.48	430	476	415	283	415	923	1,557	628	10.9	41.5
ASTRONOMY PROGRAM TOTALS:																		
04	12	28	0	1	12	0	41	2.67	505	581	399	249	399	839	1,368	512	9.7	33.3
03	11	23	0	3	14	0	40	2.61	460	491	427	327	427	1,073	1,560	598	10.7	38.8
02	10	23	0	4	11	0	38	2.48	430	476	415	283	415	923	1,557	628	10.9	41.5

Appendix 2 - Success and Satisfaction

**Astronomy Program
Course by Grade/Success/Retention**

			Grades										success	retention	
			A	B	C	CR	D	F	I	NC	W	XX	Total	Percent	Percent
			Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count		
ASTRO 20	2000	Spring	19	29	50	5	27	58	0	1	80	33	302	34.1%	73.5%
		Summer	6	10	11	0	0	2	0	0	3	5	37	73.0%	91.9%
		Fall	16	27	80	1	16	52	0	0	122	44	358	34.6%	65.9%
	2001	Spring	23	29	43	0	16	60	0	4	82	23	280	33.9%	70.7%
		Summer	2	8	36	1	15	20	1	0	19	14	116	40.5%	83.6%
		Fall	11	29	81	1	26	55	0	0	117	20	340	35.9%	65.6%
	2002	Spring	22	54	83	2	34	49	0	1	82	41	368	43.8%	77.7%
		Summer	29	22	24	1	7	6	0	0	15	6	110	69.1%	86.4%
		Fall	33	30	75	0	32	79	1	1	117	33	401	34.4%	70.8%
	2003	Spring	30	45	76	0	20	80	0	1	45	22	319	47.3%	85.9%
		Summer	33	20	19	1	5	4	0	0	3	13	98	74.5%	96.9%
		Fall	22	57	111	0	29	42	0	1	130	19	411	46.2%	68.4%
	2004	Spring	30	28	48	2	28	41	0	1	79	46	303	35.6%	73.9%
		Summer	16	19	21	0	6	9	0	0	11	8	90	62.2%	87.8%
		Fall	41	61	120	1	47	81	1	0	69	29	450	49.6%	84.7%
ASTRO 21	2000	Fall	3	2	1	0	0	1	0	0	2	4	13	46.2%	84.6%
	2001	Spring	2	3	0	1	0	3	2	0	1	1	13	46.2%	92.3%
		Fall	2	4	1	0	0	1	0	0	1	3	12	58.3%	91.7%
	2003	Spring	4	9	1	0	0	1	0	0	2	2	19	73.7%	89.5%
	2004	Spring	5	6	0	0	0	8	0	0	1	3	23	47.8%	95.7%
ASTRO 25	2000	Spring	21	13	14	0	0	3	0	0	1	1	53	90.6%	98.1%
		Summer	7	6	1	0	0	0	0	0	0	0	14	100.0%	100.0%
		Fall	18	22	14	0	0	2	0	0	12	6	74	73.0%	83.8%
	2001	Spring	26	10	13	0	2	1	0	3	12	1	68	72.1%	82.4%
		Summer	16	2	0	1	1	2	0	0	0	0	22	86.4%	100.0%
		Fall	29	7	4	1	1	4	1	0	2	1	50	82.0%	96.0%
	2002	Spring	16	7	4	3	1	4	0	0	3	3	41	73.2%	92.7%
		Fall	18	13	7	0	1	3	0	0	0	0	42	90.5%	100.0%
	2003	Spring	17	12	4	1	3	8	0	1	5	0	51	66.7%	90.2%
		Fall	24	22	6	0	1	4	0	0	2	0	59	88.1%	96.6%
	2004	Spring	20	15	8	0	0	1	0	2	3	1	50	86.0%	94.0%
Fall		23	24	13	1	2	2	0	0	0	0	65	93.8%	100.0%	
ASTRO 45	2001	Fall	2	0	2	0	2	1	0	0	3	1	11	36.4%	72.7%
ASTRO130	2000	Fall	14	0	0	0	0	0	0	0	4	1	19	73.7%	78.9%

Grade XX = None of the above/unknown.

Success Rate: Percent of students successful in courses out of total enrolled in courses (RP Group, 1996).
The success rate is calculated by dividing the numerator (number of students duplicated with A, B, C, CR) by the denominator (number of students with A, B, C, D, F, CR, NC, W, I, XX)

Retention Rate: Percent of students retained in courses out of total students enrolled in courses (RP Group, 1996).
The retention rate is calculated by dividing the numerator (number of students duplicated with A, B, C, D, F, CR, NC, I*, XX) by the denominator (number of students with A, B, C, D, F, CR, NC, W, I, XX).

**Astronomy Program
Course Summary by Grade/Success/Retention**

		Grades											success	retention
		A	B	C	CR	D	F	I	NC	W	XX	Total	Percent	Percent
		Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count		
2000	Spring	40	42	64	5	27	61	0	1	81	34	355	42.5%	77.2%
	Summer	13	16	12	0	0	2	0	0	3	5	51	80.4%	94.1%
	Fall	51	51	95	1	16	55	0	0	140	55	464	42.7%	69.8%
2001	Spring	51	42	56	1	18	64	2	7	95	25	361	41.6%	73.7%
	Summer	18	10	36	2	16	22	1	0	19	14	138	47.8%	86.2%
	Fall	44	40	88	2	29	61	1	0	123	25	413	42.1%	70.2%
2002	Spring	38	61	87	5	35	53	0	1	85	44	409	46.7%	79.2%
	Summer	29	22	24	1	7	6	0	0	15	6	110	69.1%	86.4%
	Fall	51	43	82	0	33	82	1	1	117	33	443	39.7%	73.6%
2003	Spring	51	66	81	1	23	89	0	2	52	24	389	51.2%	86.6%
	Summer	33	20	19	1	5	4	0	0	3	13	98	74.5%	96.9%
	Fall	46	79	117	0	30	46	0	1	132	19	470	51.5%	71.9%
2004	Spring	55	49	56	2	28	50	0	3	83	50	376	43.1%	77.9%
	Summer	16	19	21	0	6	9	0	0	11	8	90	62.2%	87.8%
	Fall	64	85	133	2	49	83	1	0	69	29	515	55.1%	86.6%

Grade XX = None of the above/unknown.

Success Rate: Percent of students successful in courses out of total enrolled in courses (RP Group, 1996).

The success rate is calculated by dividing the numerator (number of students duplicated with A, B, C, CR) by the denominator (number of students with A, B, C, D, F, CR, NC, W, I, XX)

Retention Rate: Percent of students retained in courses out of total students enrolled in courses (RP Group, 1996).

The retention rate is calculated by dividing the numerator (number of students duplicated with A, B, C, D, F, CR, NC, I, XX) by the denominator (number of students with A, B, C, D, F, CR, NC, W, I, XX).

Appendix 3 - Student Characteristics

**Astronomy Program
Gender by Year/Term
Duplicated Headcount**

		Female		Male		Unknown		Total	
		Count	Row %	Count	Row %	Count	Row %	Count	Row %
2000	Spring	162	45.6%	191	53.8%	2	.6%	355	100.0%
	Summer	32	62.7%	19	37.3%	0	.0%	51	100.0%
	Fall	200	43.1%	264	56.9%	0	.0%	464	100.0%
2001	Spring	156	43.2%	205	56.8%	0	.0%	361	100.0%
	Summer	85	61.6%	53	38.4%	0	.0%	138	100.0%
	Fall	173	41.9%	240	58.1%	0	.0%	413	100.0%
2002	Spring	195	47.7%	214	52.3%	0	.0%	409	100.0%
	Summer	65	59.1%	45	40.9%	0	.0%	110	100.0%
	Fall	207	46.7%	235	53.0%	1	.2%	443	100.0%
2003	Spring	173	44.5%	216	55.5%	0	.0%	389	100.0%
	Summer	43	43.9%	55	56.1%	0	.0%	98	100.0%
	Fall	205	43.6%	263	56.0%	2	.4%	470	100.0%
2004	Spring	168	44.7%	208	55.3%	0	.0%	376	100.0%
	Summer	50	55.6%	40	44.4%	0	.0%	90	100.0%
	Fall	216	41.9%	299	58.1%	0	.0%	515	100.0%

**Astronomy Program
Ethnicity by Year/Term
Duplicated Headcount**

		Ethnic Groups																	
		Asian		African American		Hispanic		Native Am./Alaskan Nat.		Other		Pacific Islander		White		Unknown		Total	
		Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %
2000	Spring	25	7.0%	10	2.8%	40	11.3%	3	.8%	3	.8%	2	.6%	247	69.6%	25	7.0%	355	100.0%
	Summer	7	13.7%	0	.0%	4	7.8%	1	2.0%	0	.0%	0	.0%	37	72.5%	2	3.9%	51	100.0%
	Fall	24	5.2%	3	.6%	61	13.1%	7	1.5%	4	.9%	1	.2%	336	72.4%	28	6.0%	464	100.0%
2001	Spring	17	4.7%	6	1.7%	47	13.0%	3	.8%	0	.0%	1	.3%	258	71.5%	29	8.0%	361	100.0%
	Summer	10	7.2%	3	2.2%	16	11.6%	2	1.4%	1	.7%	0	.0%	97	70.3%	9	6.5%	138	100.0%
	Fall	21	5.1%	8	1.9%	42	10.2%	4	1.0%	3	.7%	1	.2%	296	71.7%	38	9.2%	413	100.0%
2002	Spring	21	5.1%	4	1.0%	43	10.5%	4	1.0%	6	1.5%	1	.2%	305	74.6%	25	6.1%	409	100.0%
	Summer	6	5.5%	4	3.6%	17	15.5%	1	.9%	2	1.8%	1	.9%	68	61.8%	11	10.0%	110	100.0%
	Fall	46	10.4%	5	1.1%	47	10.6%	5	1.1%	7	1.6%	6	1.4%	297	67.0%	30	6.8%	443	100.0%
2003	Spring	29	7.5%	9	2.3%	68	17.5%	0	.0%	2	.5%	6	1.5%	250	64.3%	25	6.4%	389	100.0%
	Summer	8	8.2%	2	2.0%	11	11.2%	0	.0%	1	1.0%	0	.0%	69	70.4%	7	7.1%	98	100.0%
	Fall	28	6.0%	5	1.1%	57	12.1%	0	.0%	3	.6%	6	1.3%	337	71.7%	34	7.2%	470	100.0%
2004	Spring	20	5.3%	4	1.1%	58	15.4%	2	.5%	2	.5%	3	.8%	254	67.6%	33	8.8%	376	100.0%
	Summer	13	14.4%	0	.0%	16	17.8%	0	.0%	1	1.1%	2	2.2%	54	60.0%	4	4.4%	90	100.0%
	Fall	28	5.4%	4	.8%	70	13.6%	2	.4%	4	.8%	2	.4%	355	68.9%	50	9.7%	515	100.0%

**Astronomy Program
Ethnicity by Year/Term
Duplicated Headcount**

		Ethnic Groups																	
		Asian		African American		Hispanic		Native Am./Alaskan Nat.		Other		Pacific Islander		White		Unknown		Total	
		Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %
2000	Spring	25	7.0%	10	2.8%	40	11.3%	3	.8%	3	.8%	2	.6%	247	69.6%	25	7.0%	355	100.0%
	Summer	7	13.7%	0	.0%	4	7.8%	1	2.0%	0	.0%	0	.0%	37	72.5%	2	3.9%	51	100.0%
	Fall	24	5.2%	3	.6%	61	13.1%	7	1.5%	4	.9%	1	.2%	336	72.4%	28	6.0%	464	100.0%
2001	Spring	17	4.7%	6	1.7%	47	13.0%	3	.8%	0	.0%	1	.3%	258	71.5%	29	8.0%	361	100.0%
	Summer	10	7.2%	3	2.2%	16	11.6%	2	1.4%	1	.7%	0	.0%	97	70.3%	9	6.5%	138	100.0%
	Fall	21	5.1%	8	1.9%	42	10.2%	4	1.0%	3	.7%	1	.2%	296	71.7%	38	9.2%	413	100.0%
2002	Spring	21	5.1%	4	1.0%	43	10.5%	4	1.0%	6	1.5%	1	.2%	305	74.6%	25	6.1%	409	100.0%
	Summer	6	5.5%	4	3.6%	17	15.5%	1	.9%	2	1.8%	1	.9%	68	61.8%	11	10.0%	110	100.0%
	Fall	46	10.4%	5	1.1%	47	10.6%	5	1.1%	7	1.6%	6	1.4%	297	67.0%	30	6.8%	443	100.0%
2003	Spring	29	7.5%	9	2.3%	68	17.5%	0	.0%	2	.5%	6	1.5%	250	64.3%	25	6.4%	389	100.0%
	Summer	8	8.2%	2	2.0%	11	11.2%	0	.0%	1	1.0%	0	.0%	69	70.4%	7	7.1%	98	100.0%
	Fall	28	6.0%	5	1.1%	57	12.1%	0	.0%	3	.6%	6	1.3%	337	71.7%	34	7.2%	470	100.0%
2004	Spring	20	5.3%	4	1.1%	58	15.4%	2	.5%	2	.5%	3	.8%	254	67.6%	33	8.8%	376	100.0%
	Summer	13	14.4%	0	.0%	16	17.8%	0	.0%	1	1.1%	2	2.2%	54	60.0%	4	4.4%	90	100.0%
	Fall	28	5.4%	4	.8%	70	13.6%	2	.4%	4	.8%	2	.4%	355	68.9%	50	9.7%	515	100.0%

**Astronomy Program
Educational Goals by Year/Term
Duplicated Headcount**

		2000				2001				2002				2003				2004			
		Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall	
		Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %
educational_goal	A.A. and Transfer	120	33.8%	149	32.1%	130	36.0%	142	34.4%	140	34.2%	159	35.9%	134	34.4%	189	40.2%	147	39.1%	198	38.4%
	Transfer w/o A.A.	49	13.8%	52	11.2%	59	16.3%	46	11.1%	51	12.5%	58	13.1%	53	13.6%	48	10.2%	53	14.1%	65	12.6%
	A.A. w/o transfer	3	.8%	4	.9%	1	.3%	3	.7%	8	2.0%	1	.2%	4	1.0%	3	.6%	2	.5%	3	.6%
	Voc. Deg. w/o transfer	7	2.0%	6	1.3%	3	.8%	5	1.2%	11	2.7%	2	.5%	4	1.0%	14	3.0%	13	3.5%	5	1.0%
	Voc. Cert. w/o transfer	50	14.1%	70	15.1%	46	12.7%	60	14.5%	57	13.9%	75	16.9%	63	16.2%	78	16.6%	60	16.0%	91	17.7%
	Discover career interests/goals	26	7.3%	41	8.8%	20	5.5%	35	8.5%	21	5.1%	27	6.1%	22	5.7%	29	6.2%	16	4.3%	30	5.8%
	Prepare for new career	17	4.8%	29	6.3%	25	6.9%	29	7.0%	24	5.9%	32	7.2%	19	4.9%	27	5.7%	22	5.9%	27	5.2%
	Advance in current job	8	2.3%	2	.4%	6	1.7%	5	1.2%	4	1.0%	4	.9%	11	2.8%	3	.6%	4	1.1%	4	.8%
	Maintain certificate/license	0	.0%	0	.0%	0	.0%	2	.5%	0	.0%	0	.0%	0	.0%	0	.0%	0	.0%	1	.2%
	Educational Development	27	7.6%	32	6.9%	27	7.5%	19	4.6%	24	5.9%	18	4.1%	16	4.1%	8	1.7%	15	4.0%	13	2.5%
	Improve Basic Skills	0	.0%	2	.4%	2	.6%	2	.5%	1	.2%	2	.5%	2	.5%	2	.4%	1	.3%	1	.2%
	Complete H.S. Diploma/GED	1	.3%	1	.2%	3	.8%	0	.0%	0	.0%	1	.2%	5	1.3%	1	.2%	1	.3%	1	.2%
	Undecided on Goal	47	13.2%	76	16.4%	39	10.8%	65	15.7%	68	16.6%	64	14.4%	55	14.1%	68	14.5%	42	11.2%	76	14.8%
	Uncollected/Unreported	0	.0%	0	.0%	0	.0%	0	.0%	0	.0%	0	.0%	1	.3%	0	.0%	0	.0%	0	.0%
	Total	355	100.0%	464	100.0%	361	100.0%	413	100.0%	409	100.0%	443	100.0%	389	100.0%	470	100.0%	376	100.0%	515	100.0%

**Astronomy Program by Zip Code
Duplicated Headcount**

		Saddleback Zip		IVC Zip Codes		Out of District/Missing Zip		Total	
		Count	Row %	Count	Row %	Count	Row %	Count	Row %
2000	Spring	317	89.3%	12	3.4%	26	7.3%	355	100.0%
	Summer	45	88.2%	2	3.9%	4	7.8%	51	100.0%
	Fall	434	93.5%	9	1.9%	21	4.5%	464	100.0%
2001	Spring	318	88.1%	14	3.9%	29	8.0%	361	100.0%
	Summer	117	84.8%	12	8.7%	9	6.5%	138	100.0%
	Fall	379	91.8%	9	2.2%	25	6.1%	413	100.0%
2002	Spring	369	90.2%	12	2.9%	28	6.8%	409	100.0%
	Summer	101	91.8%	2	1.8%	7	6.4%	110	100.0%
	Fall	404	91.2%	11	2.5%	28	6.3%	443	100.0%
2003	Spring	354	91.0%	6	1.5%	29	7.5%	389	100.0%
	Summer	82	83.7%	3	3.1%	13	13.3%	98	100.0%
	Fall	434	92.3%	5	1.1%	31	6.6%	470	100.0%
2004	Spring	338	89.9%	12	3.2%	26	6.9%	376	100.0%
	Summer	75	83.3%	3	3.3%	12	13.3%	90	100.0%
	Fall	465	90.3%	8	1.6%	42	8.2%	515	100.0%