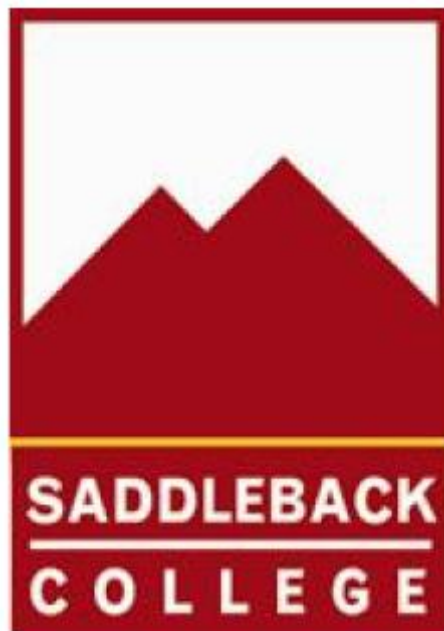


Saddleback College Program Review for Astronomy



Submitted on 20 October, 2011

Table of Contents

1.0 Overview	4
1.1 College Mission and Goals.....	4
1.1.1 Mission Statement	4
1.1.2 Goals.....	4
1.2 Math, Science, and Engineering Division Goals	5
1.3 Astronomy Program Goals.....	5
1.4 Unique Characteristics.....	6
1.4 Progress Since Last Program Review Performed in 2005	6
1.5 Student Learning Outcomes (SLO)	7
1.6 Strengths, Opportunities and Challenges.....	7
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	13
2.6 Community Outreach and Articulation	14
2.7 Accreditation.....	15
3.0 Needs Assessment and Annual Update	17
4.0 Astronomy Program Statistics.....	17

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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 for its improvement and growth. 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 department's 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 (if we leave 45 & 130, then lets say “can offer”) offer an Astronomy 20, 21 and 25 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 frequently take Astronomy courses to further their knowledge of Astronomy, but not to meet an academic requirement.

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. The other unique Astronomy course offered at Saddleback College is 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 32 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. This equipment is used by instructors for demonstrations and by students for hands-on instruction during the laboratory sessions. Students also have access to a state-of-the-art observatory used primarily to study the Sun, Moon and Planets.

1.4 Progress Since Last Program Review Performed in 2005

Notable progress has been made since the last program review held in 2005:

- Our full time Astronomy faculty member retired; The total number of sections offered has increased by 15%
- Enrollment increased by 35%
- WSCH increased by 50%
- Productivity is above the college average
- Replaced our 8 inch Schmidt Cassegrains with GOTO GPS telescopes
- The carpet was replaced with hard floors in sm 101

- We offer two online Astronomy 20 courses

1.5 Student Learning Outcomes (SLO)

Student learning outcomes have been incorporated into the program in 2007. The SLOs have been integrated into our Astronomy 20 and 25 courses. In Astronomy, 20 SLOs questions are integrated into the exams and quizzes. In Astronomy 25, SLOs are integrated into the laboratory assignments. All astronomy faculty are required to incorporate SLOs in their courses.

1.6 Strengths, Opportunities and Challenges

1.5.1 Strengths

Saddleback College offers a solid Astronomy programs as evidenced by our enrollment, growth and student success rates. Our curriculum is compatible with the courses offered by four year universities. Our Astronomy courses meet the general education and IGETC requirements. As mentioned above in Section 1.4, offering a standalone observational astronomy class is unique. We have state-of-art technology and equipment. We have large 16 inch telescopes which are used on our field trips. Additionally, we have 10 8” telescopes for student use. We recently purchased state-of-the art equipment with GOTO and GPS technology. Our observatory is of professional class. The observatory houses a high technology 16 inch aperture telescopes which is routinely used by students in the classroom and for special research projects. Two of our faculty members are observational astronomers (astronomy is a hobby for them) enabling them to teach real world astronomy labs.

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. The other unique Astronomy course offered at Saddleback College is the Solar System (Astro-21).

1.5.2 Opportunities and Challenges

Staffing - The Astronomy Program is staffed by highly competent professional full-time and adjunct faculty. We recommend that recruitment and interviews of new adjunct faculty continue in order to facilitate near-term and potential long term growth in the program.

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 70 students. Removing unused furniture will increase the capacity to about 75 students. The observatory needs to be moved to another location where it is anchored to the ground and not the roof. The current roof-top location produces way too many vibration which renders high magnification useless. To facilitate increased enrollment and prime time scheduling, the Astronomy program requires an additional classroom. It should be pointed out that the District has approved a new science building which is in the

planning stages. If the science building is not built, we need to enact the aforementioned improvements.

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 (for a total of 3 sections). The demand for Astro-25 has grown significantly over the past three years.

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	Spring 2010	<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	Spring 2010	<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 21	Spring 2010	<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 2005
Astronomy 25	Fall 2005
Astronomy 21	Spring 2005

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

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 currently offer two online astronomy 20 courses. We recommend adding at least two more online courses for Spring and Fall semesters (for a total of 4) and two in the summer.

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. These methods may include: interactive lecturing, quizzes, exams, homework assignments, oral presentations, projects, journals, papers, formal and informal laboratory write-ups, keeping of laboratory notebooks, individual and cooperative in-class student activities, and *Peer Instruction*. 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 usually based on three to four multi-chapter exams, quizzes, participation, activities and homework assignments. In the Observational Astronomy course (considered a laboratory course) grades are based on a midterm and final exam, projects, journals, papers, formal and informal laboratory write-ups, keeping of laboratory notebooks, participation, activities 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, such as that listed below:

- a) a class set of Schmidt Cassegrain 8-inch aperture telescopes to perform observational astronomy laboratories
- b) the 16 inch reflecting telescope in the observatory on the roof of the SM building
- c) the solar telescope which was recently purchased for the department

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, Smart Boards, 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 senior technician.

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 is 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, and if necessary, Wednesday 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.

Table 2-3 Astronomy Program Scheduling Strategy

Course	Schedule	Comments
Astronomy 20	- Primetime day slots (9-12 a.m. for lecture) - Nights and Friday - Two online classes	- Facilitate mainstream students and students with daytime jobs
Astronomy 25	- Nights (Monday and Tuesday night)	- Two to three sections are typically offered each semester
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 each semester

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:

- Several assessment tools are used to monitor the progress of students. These assessment tools may include: interactive lecturing, quizzes, exams, homework assignments, oral presentations, projects, journals, papers, formal and informal laboratory write-ups, keeping of laboratory notebooks, individual and cooperative in-class student activities, and *Peer Instruction. Lecture-Tutorials for Introductory Astronomy* into their Astro 20 and/or Astro 25 curriculum as an in-class cooperative exercise. Interactive lecturing is being implemented into Astro 20 and Astro 25 courses by at least one Professor.
- 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).
- Review sessions are held outside of class by several Instructors prior to exams and/or a review sheet is provided to the students.

All Astronomy courses 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 had an adequate number of full-time instructors to support the current level of course offerings. In Fall 2011 the full-time professor hired to teach physics and astronomy resigned. This position must be filled urgently.

The Physics and Astronomy Department is supported by two classified staff members: an Astronomy senior laboratory technician and a Physics senior laboratory technician. The Astronomy senior laboratory technician is a part time position (20 hours per week) supporting all of the astronomy courses. The astronomy senior laboratory technician maintains the Physics and Astronomy web pages. The Astronomy senior laboratory technician 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 senior laboratory technician may occasionally use student help.

The total amount of hours allocated to the Astronomy senior laboratory technician 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 70 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

- Immediately hire new faculty members in the event of retirements or sabbaticals. Replace faculty members
- 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.
- The Astronomy senior laboratory technician hours must be increased to 40 hours. This is required for support of the Astronomy 20 courses.

2.5 Staff Development

Both full and part time faculty stay current in their respective disciplines and on instructional methodologies through a variety of means. Not only do faculty members read the latest technical journals (e.g. Astronomy, Sky and Telescope, and other Astronomical journals) but they also read on effective pedagogical techniques thus staying current on recent discoveries in Astronomy and Astronomy teaching. Additionally, faculty members attend conferences to keep current on state-of-the-art teaching techniques. Lastly, 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. Professor Meyer-Canales took a sabbatical to study Astronomy and Astronomy Teaching during the Fall of 2009. During that time, she attended a Center for Astronomy Education (CAE) conference in San Francisco put on by the Astronomical Society of the Pacific (ASP), which consisted of an eight-hour workshop on teaching Introductory Astronomy. Many of the pedagogical techniques she learned and had reinforced (e.g. *Lecture-Tutorials for Introductory Astronomy*, *Peer Instruction*, and *Interactive Lecturing*) have been

successfully implemented into her Astro 20 & Astro 25 teaching. Professor Meyer-Canales has disseminated many products of her sabbatical to her colleagues and the Astronomy laboratory technician. Professor Meyer-Canales has been working with the Astronomy laboratory technician and adjunct instructor Bill Schramm on rewriting and writing Astro 25 laboratory experiments.

Our adjunct faculty also introduce our department to new ideas from other colleges and industries. Steve Schuh and Bill Schramm enrich the program by introducing new ideas from other 2-year colleges and Dr. Jim Repka, Geology professor, teaches Astronomy 21. JoAnn Merrell has greatly contributed to the department with her numerous activities and labs she has adapted and written that provide students with hands-on and/or collaborative learning experiences. She also played a key role in introducing Professor Meyer-Canales to the ASP conference and *Lecture-Tutorials*.

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.

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 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 Needs Assessment and Annual Update

A. Statement of Program's Current Situation

The Astronomy program is currently staffed by two full time and four adjunct faculty members. We currently have adequate faculty to cover our course offering. The equipment and facilities are adequate for the current course offerings. To facilitate growth additional faculty, additional equipment and facilities will be required.

B. Human Resource Needs

Human resources support will be required on an as needed basis for the following requirements:

- Immediately hire new faculty members to replace a faculty member who quit teaching.
- Actively recruit and hire new qualified adjunct faculty.
- The Astronomy senior laboratory technician hours must be increased to 40 hours. This is required for support of the Astronomy 20 courses.

C. Instructional/Service Needs

- Add Astronomy tutors at the LAP. The LAP is a vital resource used by Saddleback College students.
- 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 currently offer two online astronomy 20 courses. We recommend adding at least two more online courses for Spring and Fall semesters (for a total of 4) and two in the summer.
- Additional online support will be needed for faculty members not familiar with Blackboard
- Provide timely IT support
- 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 each semester
-

D. Research Needs

- Continue providing the statistics similar to Section 4 on a yearly basis
- Alert faculty members about potential grants related to astronomy

E. Technical, Equipment and Other Resource Needs

- 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.
- Replace all computers in the department with new computer in 2012
- Replace the 10 8" Schmidt Cassegrains with 10 newer models in 2013

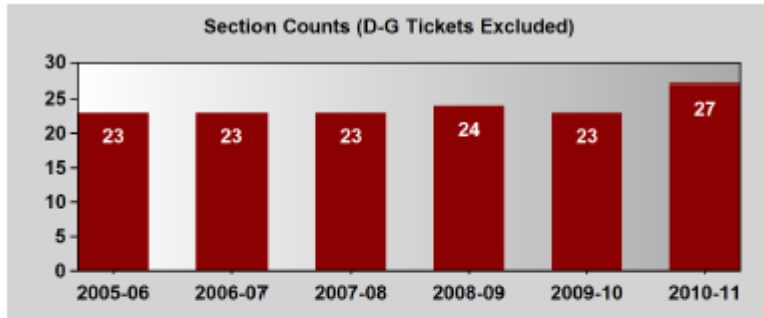
F. Facilities Needs

The Astronomy program requires more storage space and an additional classroom. These issues have been addressed by the approval of the new science building. Required maintenance of the astronomy facilities (roof, observatory, and classrooms) should be carried out in a timely fashion, preferably two weeks after maintenance has been notified

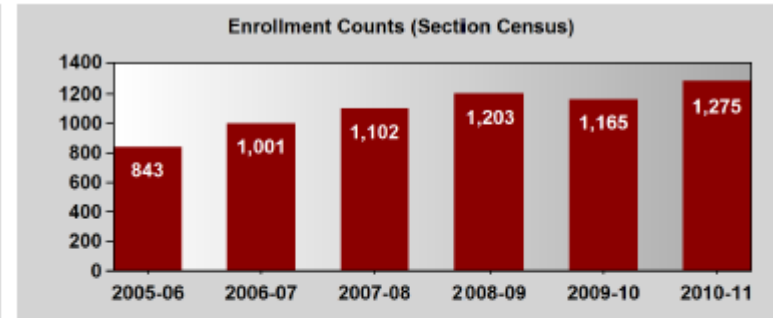
G. Marketing and Outreach Needs

Use the uniqueness of our Astronomy program to promote and market the program to the student and general community. The college needs to hold more public observing night to promote the program. Faculty members must participate in transfer and high school senior days.

4.0 Astronomy Program Statistics

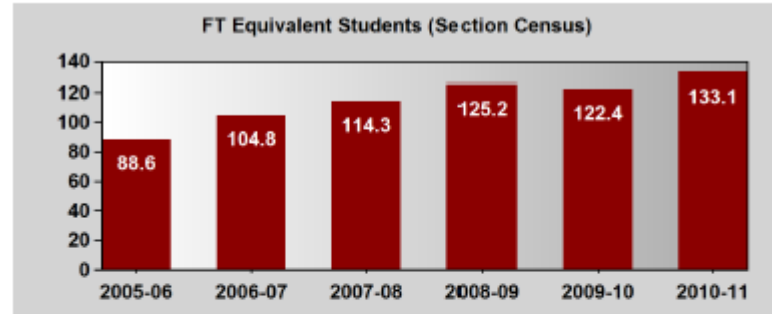
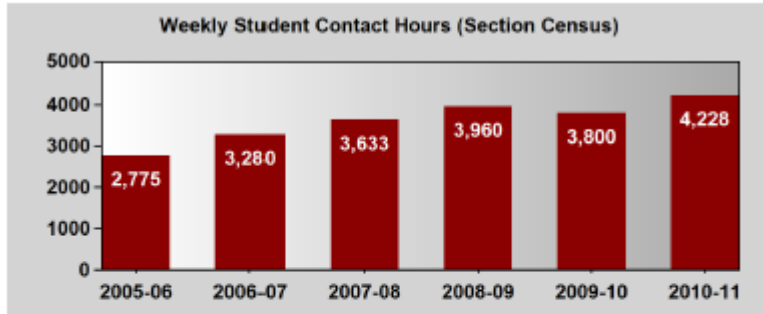


Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	19	18	18	19	18	20
ASTR 21		1	1	1	1	2
ASTR 25	4	4	4	4	4	5
Total Sections	23	23	23	24	23	27



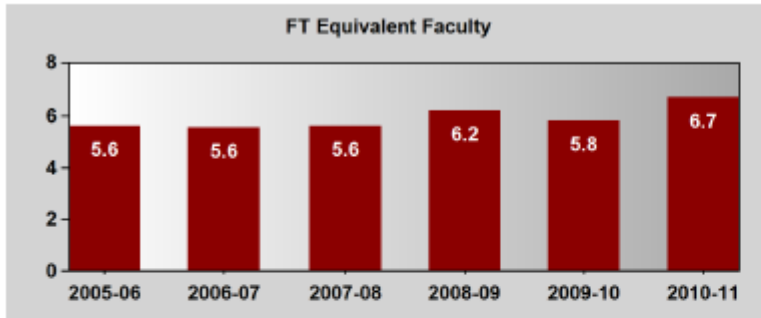
Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	720	857	945	1,029	1,007	1,064
ASTR 21		10	16	18	19	44
ASTR 25	123	134	141	156	139	167
Total Enrollments	843	1,001	1,102	1,203	1,165	1,275

Detail by : Course ID

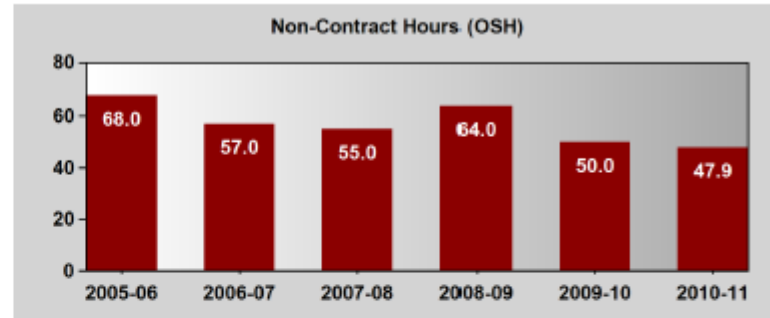


Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	2,160	2,571	2,835	3,087	3,021	3,192
ASTR 21		39	93	93	84	201
ASTR 25	615	670	705	780	695	835
Total WSCH	2,775	3,280	3,633	3,960	3,800	4,228

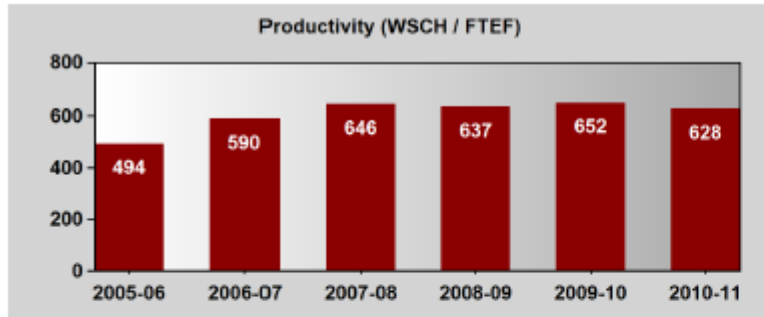
Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	72.7	86.9	92.8	104.4	103.2	108.3
ASTR 21		1.1	1.7	1.9	2	4.7
ASTR 25	15.8	16.9	19.7	18.9	17.2	20.1
Total FTES	88.6	104.8	114.3	125.2	122.4	133.1



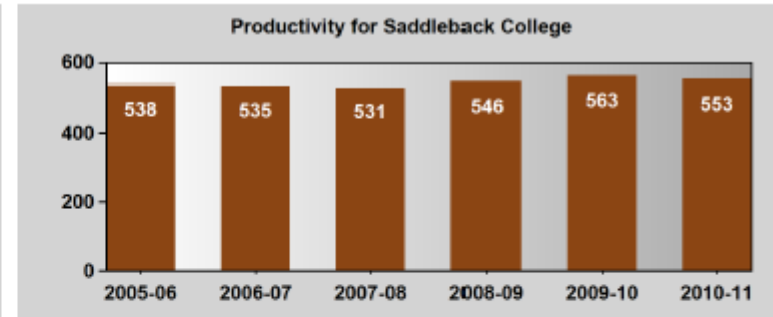
Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	4.42	4.16	4.22	4.82	4.43	4.83
ASTR 21		.2	.2	.2	.2	.4
ASTR 25	1.2	1.2	1.2	1.2	1.2	1.5
Total FTEF	5.62	5.56	5.62	6.22	5.83	6.73

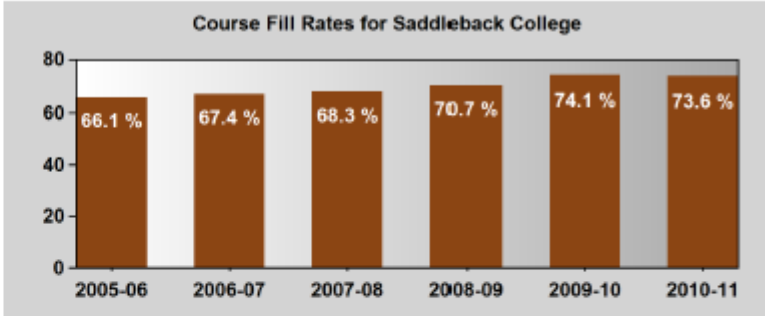
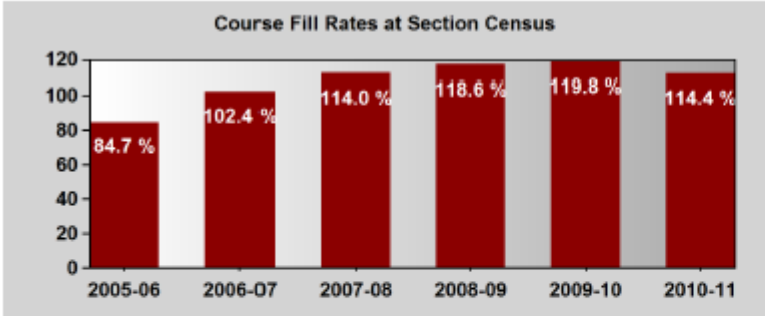


Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	63	47	45	54	30	42
ASTR 21						
ASTR 25	5	10	10	10	20	6
Total OSH	68	57	55	64	50	48

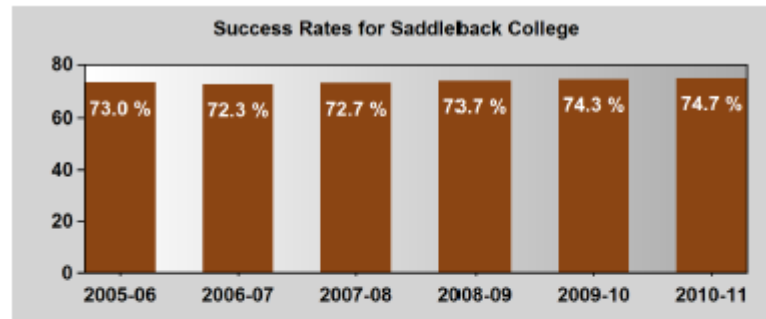
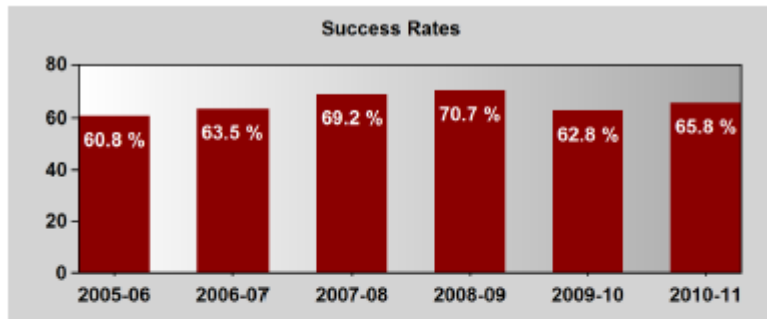


Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	489	618	672	640	682	661
ASTR 21		195	465	465	420	503
ASTR 25	513	558	588	650	579	557
Productivity	494	590	646	637	652	628

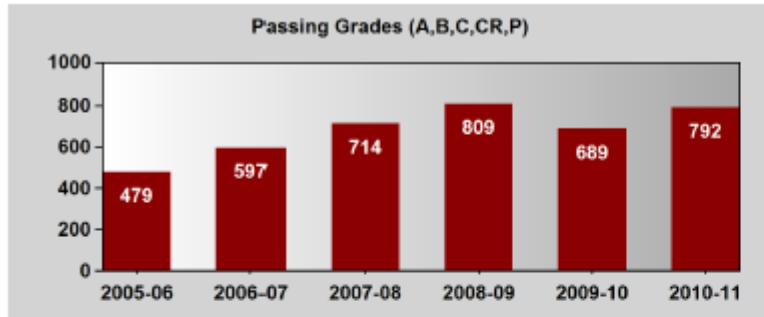




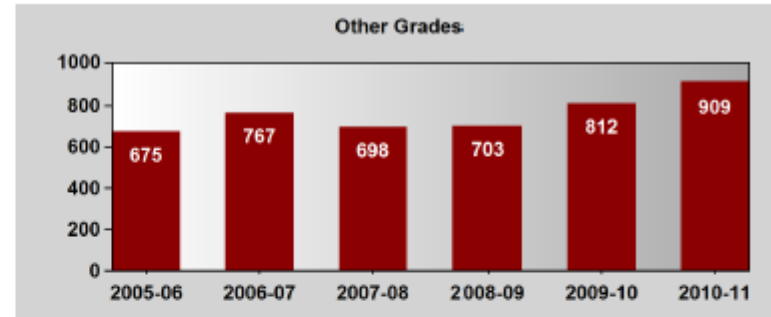
Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	84.2	105.8	116.7	120.4	124.3	118.2
ASTR 21		33.3	53.3	60	63.3	73.3
ASTR 25	87.9	95.7	100.7	111.4	99.3	95.4
Course Fill Rates	84.7	102.1	112.4	117.4	118.9	112.3



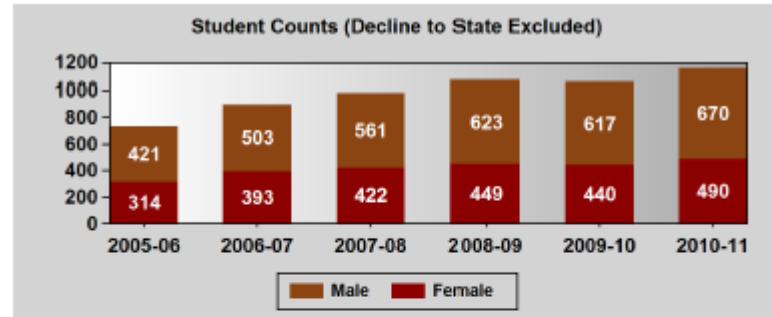
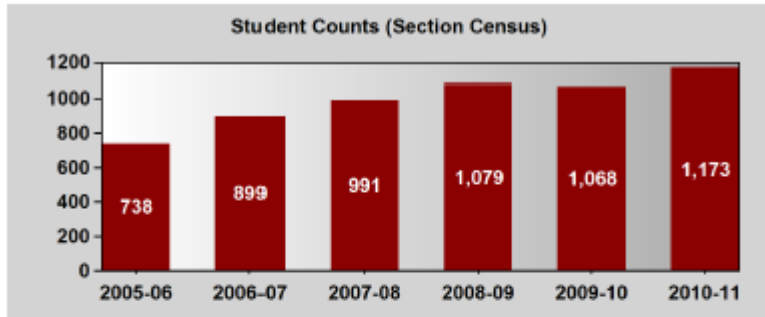
Course ID	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ASTR 20	55.8	59.8	66.0	67.2	60.3	63.3
ASTR 21	0.0	88.9	71.4	76.5	38.9	82.5
ASTR 25	89.7	85.7	89.1	93.2	83.1	77.2
Success Rate	60.8	63.5	69.2	70.7	62.8	65.8



Passing Grades	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
A	168	248	320	404	331	247
B	152	164	193	178	193	292
C	152	184	198	217	158	247
CR	7	1	3	10		
P					7	6
Total	479	597	714	809	689	792



Other Grades	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
D	57	62	67	61	88	98
DR	366	424	380	368	404	498
F	134	136	145	148	182	178
IF						2
MW	1	1				
NC		2	6			
NP					3	3
W	117	142	100	126	135	130
Total	675	767	698	703	812	909



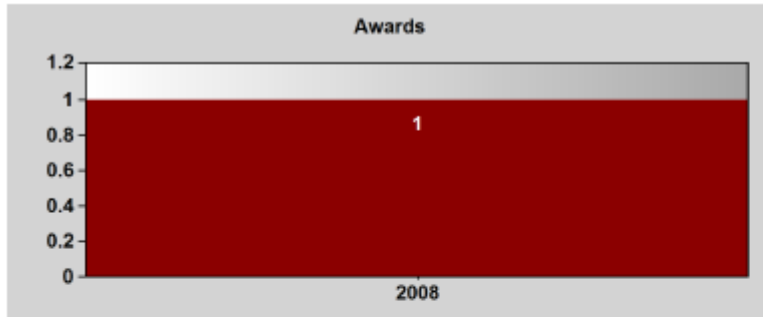
Age Group	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1. Below 18	33	34	25	41	25	34
2. 18-21	550	647	749	788	820	842
3. 22-29	113	159	154	187	157	227
4. 30-39	19	30	35	30	41	35
5. 40-49	18	18	19	15	14	22
6. 50-59	4	11	8	9	8	10
7. Over 59	3	2	1	11	3	3
Total Students	738	899	991	1,079	1,068	1,173

Student Counts by Ethnicity

Ethnicity	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
White, Non-Hispanic	425	523	625	637	588	727
Decline to state	122	129	84	113	145	85
Mexican, Chicano, Mexican-American	58	66	77	99	96	81
Mixed Ethnicity	27	45	54	53	84	142
Other Hispanic	13	19	21	25	24	23
Filipino	12	15	11	17	17	20
Black, African-American	13	12	10	19	17	20
Japanese	3	19	15	19	11	4
South American	5	9	15	14	13	10
Other Non-White	5	4	15	17	7	4
Vietnamese	6	5	8	8	10	10
Other Asian	7	4	8	4	14	10
Middle Eastern	10	10	6	11	6	3
Korean	8	8	11	11	2	4
Chinese	6	7	10	6	8	7
American Indian, Alaskan Native	4	6	8	8	4	4
Central American	5	7	3	8	6	5
Indian Sub-Continent	1	3	2	3	8	4
Other Pacific Islander	4	2	3	2	5	3
Pacific Islander, Hawaiian	3	2	2	2	3	1
Pacific Islander, Guamanian	1	2	1	1	1	1
Cambodian	1	1		1	1	2
Pacific Islander, Samoan	1	1	1			1
Loatian			1	1		2
Total Students	738	899	991	1,079	1,068	1,173

Student Counts by Educational Goal

Educational Goal	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Obtain a Bachelor's degree after Assoc.	312	382	473	516	536	598
Obtain a Bachelor's degree w/o Assoc.	92	147	155	170	172	174
Undecided on goal	94	120	141	166	125	149
Obtain a voc certificate and transfer	115	111	105	87	68	47
4 yr col std taking crs to meet 4 yr requirements				36	64	102
Prepare for a new career	43	29	33	19	21	20
Discover/develop career interests	31	25	29	22	21	22
Personal Development	18	28	13	17	15	15
Obtain two-year voc. degree w/o transfer	8	12	10	8	8	16
Complete credits for HS diploma or GED	7	12	8	11	8	4
Obtain a non-voc degree w/o transfer	6	4	5	6	13	15
Advance in current job/career	7	12	8	9	5	3
Improve basic skills	3	5	6	9	6	1
Obtain a voc certificate w/o transfer	2	5	4	2	4	4
Maintain license		2	1	1	1	2
		5				
To move fr NCR coursework to CR coursework					1	3
Total Students	738	899	991	1,079	1,068	1,173



Awards by Age Group	2008
7.Over 59	1
Total Awards	1
Awards by Major	2008
Astronomy	1
Total Awards	1
Award Type	2008
Associate in Arts	1
Total Awards	1

Staffing Counts (Instructors Assigned to D-G Tickets Only Have Been Excluded)

Employee Type		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
PART-TIME	Dickinson, Greg					1	1
	Hubbard, Bill		1				
	Kim, Yong	1					
	Merrell, Jo Ann	1				1	1
	Sackett, Bob	1	1	1	1		
	Schramm, William	1	1	1	1		1
	Schuh, Steven	1	1	1	1	1	1
	Total	5	4	3	3	3	4
Total	5	4	3	3	3	4	