<table>
<thead>
<tr>
<th>FISCAL YEAR</th>
<th>ID NUMBER</th>
<th>COLLEGE</th>
<th>DISTRICT</th>
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<tbody>
<tr>
<td>1991-92</td>
<td>91-0001</td>
<td>Chaffey</td>
<td>Chaffey</td>
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### Using the Planetarium Across the Curriculum

<table>
<thead>
<tr>
<th>FUNDING CATEGORY &amp; AWARD</th>
<th>ELIGIBLE PROGRAM</th>
<th>PROJECT CATEGORY</th>
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</thead>
<tbody>
<tr>
<td>Grant = $15,000</td>
<td>E --- Improvement of Trad. Instruction Prog</td>
<td>Curriculum Design</td>
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<thead>
<tr>
<th>PROJECT PRODUCT</th>
<th>PROJECT TOPIC #1</th>
<th>PROJECT TOPIC #2</th>
<th>ACADEMIC SUBJECT</th>
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<tr>
<td>Resource Materials</td>
<td>Curriculum Develop</td>
<td></td>
<td>Astronomy</td>
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<tr>
<th>PROJECT DIRECTOR</th>
<th>PROJECT SUPERVISOR</th>
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<tr>
<td>David White, Planetarium Director</td>
<td>James M. Anderson, VP Planning &amp; Development</td>
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### PROPOSAL DESCRIPTION

This small project created instructional modules, curriculum guides and Planetarium programs in six academic programs at Chaffey College. The six disciplines involved were Language Arts, Geology, Physics and Mathematics, Visual Arts, Aeronautics and Theater Arts. The funds allowed for release time and or stipends for faculty involved in the development of these cross disciplinary modules.
Using the Planetarium Across the Curriculum

Chaffey College's Milliken Planetarium is one of only about 800 planetariums in the entire world. It represents a very specialized, technical, and expensive learning environment that traditionally has been used only for the teaching of astronomy classes. In recent years, with the support of the Chaffey College Foundation, the Planetarium has begun to expand its programming. Currently, over 15,000 K-12 students attend a variety of programs at the Planetarium, and a series of adult and family-oriented programs are also being offered on weekends. In discussing the future plans for this facility, a number of suggestions were made in terms of tying the Planetarium into other instructional areas of the college and using the Planetarium facilities to enhance the educational experiences of students in many disciplines.

We are proposing a small project that would create instructional modules, curriculum guides, and actual Planetarium programs in six academic areas across the campus. The project has the enthusiastic support of faculty in many disciplines, and we are proposing a partnership project wherein we would provide stipends and/or release time for faculty members to work with our Planetarium director, who will function as an instructional aide, in the development of six instructional modules of approximately one-hour duration each. Once the modules are completed, the students in the cross disciplinaries will be invited to the Planetarium for specialized showings and evaluation of the newly created modules. In addition, the package of six modules will be modified and used in the evenings and on weekends as part of our community-oriented programming. It is intended that once the modules are created that they will be packaged in a way that they can be used again and again for many years. The Chaffey College Foundation will support this project by providing funds for additional instructional equipment, service contracts, and other costs necessary for expanding the program offerings so that they become available to the larger community. The six areas in which we plan on developing the Planetarium programs are as following:

- **Language Arts**
  a program or series of programs will be developed with Professor Peggy Stiffler who teaches a course on mythology. This is particularly relevant since most mythology is linked intrically to both astronomy and astrology.

- **Geology**
  Professor David Bixler has used the Planetarium for classes in the past regarding the formation of the universe and the formation and composition of the planet Earth.
Physics Mathematics
Adjunct Professor Michael Ray and astrophysicist with the General Dynamics Corporation will prepare a program showing the links between astronomy and the development of mathematics. We will also explore areas in which the Planetarium might be used to enhance the physics curriculum.

Visual Arts
Our Professor Byron Wilding and the Museum/Gallery director Ginger Eaton will plan a Museum/Gallery exhibit dealing with aviation, space, and astronomy that will be tied to a special program at the Planetarium.

Aeronautics
The Aeronautics faculty and the U.S. Coast Guard Auxiliary will assist us in developing a plan for using the Planetarium as a tool for the teaching of celestial navigation for our students and the general public.

Theatre Arts
Theatre director Art Sheppard will work with us in investigating ways of using the Planetarium as a venue for dramatic presentations and performance art. In addition, the theatre staff and costuming department will assist in suggesting ideas for using both costuming and theatrics as ways of enhancing the presentation in the Planetarium programs at all levels.
Using the Planetarium Across the Curriculum

1. Specific Educational Program Being Addressed

Program and Services Addressed:

This project addresses five areas of the funding priorities for 1991/92 as well as four areas of the Board of Governors 1990/91 Basic Agenda. The primary focus of this project, however, is to produce improvements in a traditional instructional program as well as use the technology of one discipline to improve instruction in six other disciplines as well. In order to do the above, we will improve the teaching abilities of faculty members in at least six disciplines and, hopefully, raise educational standards in these disciplines as well. Secondary priorities of this project include its interdisciplinary nature and the involvement of non-college institutions, particularly the General Dynamics Corporation, the Griffith Observatory, the U.S. Coast Guard Auxiliary, and others. In addition, the project will have a spin-off effect of updating the vocational curriculum in Aeronautics as well as the core curricula of mathematics and physics. In accomplishing the above, we should improve the quality of instruction and promote excellence in many classrooms by improving the teaching of the participating faculty members as well as the quality of the learning experience for their students. Finally, since the project is both experimental in nature, as well as involving the students in new experiences outside their normal classrooms, it has an experimental learning aspect to it. The initial research and programming will be done during the summer of 1991, and it is thus included in our intersegmental summer program.
2. Specific Problems Being Addressed

Problems Addressed:

This project addresses the following three problem areas:

A. There is a pressing need to improve the quality of instruction as well as the teaching abilities of faculty members across the campus. A traditionally effective way of doing this has been to develop cross-disciplinary programs as well as team-teaching methodologies in the classroom. We are proposing a very specialized, yet innovative and exciting, approach towards solving this problem in selected areas.

B. There is a need to create renewed excitement in our classrooms for both our students and our faculty. We propose addressing this problem through the innovative use of technology as well as outside consultants, exhibits, and performing arts.

C. There is a need on our campus to more fully utilize a very specialized and highly expensive instructional space, namely the college’s Planetarium. The planetarium contains 76 seats which are used almost exclusively for astronomy classes. This learning environment would cost approximately $1.5 million dollars to duplicate. It has the potential of becoming a valuable instructional resource for many areas of the college.
3. Population To Be Served

Populations Served:

This project will serve students and renew faculty in the following nine areas:

A. The college teaches courses in mythology through our Language Arts Division. We anticipate approximately 100 Language Arts students will participate in this program during the project year. Since mythology is linked intricately to both astronomy and astrology, having visual displays that are linked specific lectures should greatly enhance the students' understanding and appreciation of mythology.

B. In the area of Geology, many of the principles of the formation of the Earth and its elements are linked to astronomical principles that can be visually demonstrated and experienced by the students in the Planetarium. In addition, the Planetarium display areas contain samples of meteorites and false meteorites that the students can observe and examine. Approximately 100 Geology students will participate in these demonstration/lectures during the course of the project year.

C./D. Many of the principles in the fields of mathematics and physics were derived from astronomical observations and experiments designed to attempt to explain the formation and/or relationship of the physical universe. Many of these principles can be visually displayed using the Planetarium and its specialized equipment. We feel that the use of this technology could greatly enhance the students’ experience, particularly in “dry” subjects such as mathematics. We anticipate a minimum of 200 mathematics and physics students will participate in these Planetarium shows.

E. In the area of the visual arts, we will experiment with a combination of museum displays linked Planetarium shows whereby the museum exhibits will enhance the Planetarium experience for all of the students involved, and the Planetarium becomes a potential medium for artistic expression and experimentation for both our faculty and art students as well. We anticipate that 50 art students would benefit from this experience, and that 2,000 people would observe the museum presentation related to the Planetarium. Art projects related to astronomy as astrology will also be promoted.

F. In the area of Aeronautics, we plan on using the Planetarium as an instructional aid for a course, or series of courses, in celestial navigation. We estimate that 30 of our students will benefit from this course, and as many as 100 non-credit students will benefit as well through the U. S. Coast Guard auxiliary.

G./H. We plan on tying theatre arts into the Planetarium in two ways. First, we will experiment with using the Planetarium as a venue for the performing arts. We will explore the notion of trying some kind of dramatic presentation into Planetarium shows and/or using the Planetarium effects as a backdrop for a specialized theatre presentation. Second, We...
will use the vast collection of costumes and costuming skills that are present through the college's costume design program to enhance the Planetarium programs and presentations at all levels. We estimate 100 Creative Arts students will participate.

I. In addition to our own students, each of the programs above will be offered to a general audience through our regular program of Community Services offerings. We estimate that as many as 3,000 adults will benefit from what is developed above. In addition, portions of what is developed above may be integrated into the programming that we do for K-12 students in order to enhance their educational experiences. Over 15,000 elementary school students participate in our Planetarium shows each year.
4. Objectives

Project Objectives:

This project will accomplish the following four objectives:

Objective One:
Involve faculty from eight instructional disciplines in creating special Planetarium programs and to serve over 580 Chaffey College students in the programs.

Objective Two:
Develop curricular materials and instructional modules that can be disseminated to other colleges and public planetariums.

Objective Three:
Evaluate the effectiveness of using the Planetarium across the curriculum.

Objective Four:
Market the programs developed to the district population through an exhibit, Community Services offerings, and K-12 school programming. Using a Planetarium Across the Curriculum Chaffey College-March 1991
5. Workplan Narrative

[NO “WORKPLAN” ACCOMPANIES THIS DOCUMENT.]
6. Expected Outcomes

Anticipated Outcomes:

The successful completion of this project will result in the following outcomes:

A. Improvement of the curriculum in at least eight disciplines across the campus.
B. The development of permanent curriculum materials that have the potential for continued utilization for many years in many disciplines.
C. The cross-disciplinary involvement of faculty members from many diverse disciplines in an innovative project.
D. The involvement of outside institutions and businesses in curriculum development in several areas of the college.
E. An enriched educational experience for several hundred of our credit students during the project year, as well as up to 5,000 adults from across the community, and up to 15,000 K-12 students in a spin-off program.
F. Once the curriculum materials are developed, they will be available for utilization for the targeted courses, as well as other areas, for many years to come. The Chaffey College Foundation, which supports Planetarium operations, is committed to the continuation of these programs into the future. Since most of the funding requested is for program development, the actual cost of operating these programs in the future is thought to be minimal.
G. These project materials have the potential for replication at other institutions operating planetariums and will be made available to them, at cost, by our planetarium staff.
7. Evaluation Plan

Evaluation Plan:

Two simple evaluation methodologies will be employed in this project as follows:

First, within each discipline where new programs are being developed, the division chairperson and interested faculty will be asked to observe the premier showing of the program or programs created, and an evaluation and feedback form will be created to get their input. Based on the feedback provided from this initial session, as well as participant evaluations, changes or modifications in the program may be undertaken if improvements are indicated.

Second, participants at all Planetarium shows are given a separate evaluation form and encouraged to complete it. This form may be modified for use in the specialized programs. In any case, there will be opportunities for the students and other participants in each of these course offerings to provide feedback, both to the instructor as well as the Planetarium personnel.

A Planetarium Committee consisting of teachers, community representatives, business leaders, and astronomers exists through the college’s foundation. They will assist in the evaluation process.
8. Dissemination Plan

Dissemination Plan:

Once the course materials are completed, they will become part of the normal curriculum library of the academic division to which they relate. Copies of the course materials will also become part of the Planetarium Library for use both by the intended discipline as well as available for cross-disciplinary usage in other areas. The academic materials developed during this project will also be modified and/or used as is for a wide range of community offerings through the normal Planetarium programs. Specialized materials created for the various disciplines will be made available, at the cost of duplicating them, to other Planetariums throughout the state as well as other areas. This dissemination will occur through the United States Planetary Society and the Griffith Park Observatory as well as other networks that link astronomers and planetarium directors.
91-0001

9. Budget Narrative

[NO “BUDGET NARRATIVE” ACCOMPANIES THIS DOCUMENT.]