ANTIOCH UNIFIED SCHOOL DISTRICT
CURRICULUM PROPOSAL

99/00-02
# of Proposal

Proposal is to: ☒ Add ☐ Modify ☐ Delete ☐ Pilot

This change is for: ☒ Course ☐ Program ☐ Material ☐ Assessment

The change will affect: ☒ Content and Objectives ☒ Credits/Requirements ☐ Subjects ☐ Staffing ☐ Other Courses ☒ Texts and Materials ☐ Other Departments

Course # Semester 1

Course # Semester 2

Course # Full Year

Course Title: **Astronomy and Earth Science**

Department: Science **Subject:** Science **Grade Level:** 10

Prerequisite for Class: Concurrent Geometry, 9th grade science **Teacher Recommendation:** Yes

Course Length: Year-Long **Credit:** 10 **Max Credits:** ☒ CP ☐ AP ☐ Honors ☐ Voc Ed

Graduation Requirement: No **Fee Required:** No

Course Description

Write a description suitable for use in a student course catalog.

Astronomy and Earth Science is an interdisciplinary, integrated, year-long lab course in which students will learn about the earth, the solar system, stars, the galaxy and the universe. The astronomy section of the course will provide experiences in planetary science and astronomy, and the Earth Science section will provide experiences about the structure of the earth and its surface. Students will learn about earthquakes, rock identification, forces which shape the surface of the earth, the earth's place in the universe, constellations, lives and deaths of stars, and the latest astronomical research on new planet discoveries. In Astronomy and Earth Science students will be expected to bring together and exploit skills learned in Geometry class, 9th grade science, history class, english class, and fine arts (through drawings and presentations).

Course Content and Evaluation

List specific skills and knowledge students will accomplish through this course. Decribe the assessment tools and products used to determine the degree to which a student has accomplished the objectives.

Objectives *The student will:*

1. Students will be able to know facts and/or do observations and experiments about the following:

Astronomy

I. The study of science and experimentation
II. Historical Astronomy
III. Observational Astronomy
  a. Observing from the earth
  b. Use of observing instruments
IV. Planetary Astronomy
V. Physics and Astronomy
  a. Gravity and orbits
  b. Electromagnetic radiation
VI. Time
VII. Stellar Astronomy-Life and death of stars
VIII. Galactic Astronomy
IX. Advanced topics
  a. Relativity
  b. Current research

Earth Science

X. Geology
  a. Plate Tectonics and Continental Drift
  b. The Rock Cycle
  c. Identification of Rock Types
  d. Geological Time
XI. Meteorology

Assessment

1. Classroom assessments.
2. Total Quality Management quizzes based on CA science standards relevant to the class.
3. Evaluation of student performace at student-led astronomy sessions for younger students.
4. Evaluation of major student research project of "science fair" leve complexity.
5. Ability of students to use a telescope to find a specific target.
6. Pass a star-and-constellation identification quiz.
7. Identify unknown rock samples based on standard techniques.
8. Read weather maps and make basic predictions based on changing conditions.

a. Causes of weather/Climate
b. Systematic measurements of weather
c. Weather prediction

Astronomy and Earth Science

1.0 Needs Assessment/Needs Statement

1.1 What need will this course/program fulfill that cannot be met by current programs?

1. This course will address state Earth Science standards not in the current curriculum, for example standards for Earth Science #1 and 2, Dynamics of the Earth (3,5, 6) and investigation/experimentation (see attachment #1).
2. Because this course covers material not in the current curriculum but represented in the standards, we expect it to have a positive impact on the relevant SAT 9 reporting areas.
2. Students not normally taking a third year of science will be encouraged to do so because of the popular topics covered by this course (see survey results attached).

1.2 How was this need determined? (Include test or other hard data to indicate need.)

1. Survey of standards in 9th grade science used in writing 9th grade science curriculum, plus lack of other earth science curriculum. See attached 9th grade science curriculum map to standards (attachment #2).
2. Survey of 10th grade biology students asked if students were interested in taking a third year of science, and if so, on what topic. The results are attachment #3.

2.0 Affect on Other Aspects of the School/District Program

2.1 What groups of students and how many do you anticipate will be impacted by the change?

1) Students not predisposed to take 3rd year of science may decide to do so
2) Students seeking 3rd science credit with less intimidating content than honors and AP courses now offered

2.2 What affect will this proposal have on staff assignments?

1 section proposed should not require additional FTE staffing.

2.3 What special skills, training, or experience will be required of a teacher of this course?

Background or experience with Astronomy and Earth science.
General science certification.
Experience observing the night sky using telescopes.
Understanding of Earth sciences including meteorology and geology.

2.4 What successive classes will be needed if this course is approved? (Ex. German I approved, German II needed)

none.

3.0 Goal Statements

List the Major Concepts and Goals of the course/program.

1) Draw students into the science program who would not normally take a third year of science.
2) Improve SAT 9 scores in Earth Science.

3) Address more of the CA science standards than present curriculum.
4) Use hands-on activities to excite students at several grade levels abou t the universe and earth around them.

Astronomy and Earth Science

4.0 Projected Costs

For items 4.1 – 4.5, itemize and provide estimated annual costs.

4.1 Personnel. List position(s). (Include teachers, aides, student help, and annual cost.)

1 class period from existing personnel.

4.2 Major supplies and services. (Include textbooks, software, training, contracts for services, etc.)

For ASTRONOMY, we will use the REDSHIFT 1.2 CD ROMS already owned by the school. For EARTH SCIENCE (2nd semester), we recommend the use of extra copies of the 9th grade science text Conceptual Physical Science (chapters not covered in the 9th grade science course.)

4.3 Capital outlay. (Include machines, computers, remodeling space, large items.)

Estimated annual equipment costs are ZERO, as we will utilize already existing science department resources.

4.4 Total estimated <u>startup cost</u>. (Include materials, textbooks, hardware, software, etc.)

Textbooks at $55 each x 40 books (35 books plus attrition) = $2400. NO ADDITIONAL hardware and software startup costs. If enough extra copies of the textbook exist, no additional purchases will be required.

4.5 Total estimated reoccurring costs. (Include material replacement, repairs, contracts, etc.)

Normal textbook attrition. Telescope replacement after 5-7 years of approximately $2000.

4.6 List funds that will be used to pay for the above costs.

Instructional materials budget from school general fund.

5.0 Program Assessment

What pre and post data will be collected to demonstrate improved student achievement (e.g., student test results, student and parent surveys, grade distribution, class sign-ups, etc.)

1) comparison of SAT 9 scores from official data roster (pre and post)
2) student pre-and post interest surveys
3) student enrollment figures pre-and post- initial class offering

6.0 Instructional Resources

List below the major instructional materials to be used in the proposed course. (Include textbooks, videos, trade books, etc.) Indicate whether materials are on hand or must be purchased. Refer to AR 6406 regarding selection of instructional materials.

Type of material	Publisher	Title	Author	Copyright	Cost	Have/ Need
CD-ROM	Maris	Redshift 1.2	Maris Publishing	1994	$50	HAVE
Textbook	Addison-Wesley	Conceptual Physical Science	Hewitt et al	1999	54.75	NEED

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Signature Page For **Astronomy and Earth Science**

List names of all affected principals, councils, departments and teachers with whom you have discussed this curriculum proposal. (Don't surprise other sites! Notify everyone who could be affected by this change.)

Name/School	Date Notified	Position Held
Dee Hopfenspirger/DVHS		☐ Agree ☐ *Disagree
Jeff Reich/Antioch HS		☐ Agree ☐ *Disagree
Britt Hammond/Antioch HS		☐ Agree ☐ *Disagree
Maria McClain/DVHS		☐ Agree ☐ *Disagree
Debra Lee /SSB		☐ Agree ☐ *Disagree
Jeff Adkins/Kitty Carton/DVHS		☐ Agree ☐ *Disagree
Site Council DVHS		☐ Agree ☐ *Disagree

***NOTE:** **If an individual and/or group does not agree with this intent, they must submit a written statement with this intent explaining why they disagree so both sides of the issue can be discussed at Curriculum Council.**

Cheryl Domenichelli	Deer Valley High	Teacher
Submitted By	**School**	**Position**

Dee Hopfenspirger

Principal's name entered as approval **Date**

Do not write in this section.

Curriculum Council Recommendations:

☐ Accept: Complete Attached Proposal

☐ Reject:

Council Chairperson Signature	Date Reviewed	Date Approved
Reviewed and approved by Administrative Council:	Date Reviewed	Date Approved
Reviewed and approved by Board of Education:	Date Reviewed	Date Approved

Successive classes none.