Mt. Diablo Unified School District
Course of Study

COURSE TITLE: Dynamic Physics of the Universe

COURSE NUMBER: 802950- TBD

DEPARTMENT: Science

LENGTH OF COURSE: One Year

CREDITS PER SEMESTER: 5

GRADE LEVEL(S): 9-12

REQUIRED OR ELECTIVE: Required

PREREQUISITES: None

BOARD OF EDUCATION ADOPTION: June 2023

COURSE DESCRIPTION:
Dynamic Physics of the Universe is a survey course for students with significant cognitive disabilities who are anticipated to earn a high school diploma through the alternative pathway in accordance with California Education Code 51225.31.

Dynamic Physics of the Universe, a course based on the Next Generation Science Standards, explores the way in which physical processes govern the universe. Physics is the study of matter, forces, and their interactions. By using evidence from experiments, research, and observations, students will learn how to investigate the natural world.

COURSE OBJECTIVES

Content Themes:
- Mechanics in Motion
- Momentum and Energy
- Waves and Light
- Electricity and Magnetism
- Subatomic Particles

SKILLS:
- Sequencing and Using a Timeline
- Interpreting Graphics (Cartoons, photos, maps, charts, graphs, etc.)
- Determining Cause and Effect
- Identifying Bias and Point of View
- Conducting effective research
- Speaking and listening and interpreting (academic discussion, presentation, etc)
- Collaborating constructively on team and group projects.

Course Content

Unit 1 Title
Mechanics in Motion
Unit 1 Description and Sample Activities
Representing Motion: Students will learn that motion can be modeled and predicted. Students will demonstrate understanding of gravity, friction, inclined planes, acceleration and inertia. Sample activities may include: ● Launching rockets and measuring distance ● Racing balls or similar items on a track and testing variables and documenting and reflecting on findings ● Studying the solar system and planetary movement

Unit 2 Title
Momentum and Energy
Unit 2 Description
Students will learn that energy comes in many forms, can be transferred or transformed, and is conserved, and that these properties allow humans to use energy. Students will learn about thermal energy, heat, and the role that these concepts play in everyday life. Sample activities may include: ● Demonstrate collisions and experiment with variables that reduce the impact of the collision ● Experiment with a variety of substances at different temperatures and review results

Unit 3 Title
Waves and Light
Unit 3 Description
Students will learn about and develop an understanding of the basic properties and behaviors of waves, including light waves. Sample activities may include ● Students will use a mirror to view reflect and refract light ● Students will use colored disks to understand the impact of combining colors ● Students will use a spring toy to explore the concept of light and sound waves

Unit 4 Title
Electricity and Magnetism
Unit 4 Description
Students will learn that electric currents allow for the transfer of energy, which can be transformed into other useful forms of energy. Students will learn that both permanent magnets and electromagnets produce magnetic fields, which can be used in a variety of applications, including motors. Sample activities may include: ● Exploring magnets and their impact on a variety of substances at different distances and analyzing the data gathered ● Experimenting with closed systems and open systems when transferring electrical current ● Researching how magnets are incorporated into common commercial items.

Unit 5 Title
Subatomic Particles
Unit 5 Description
Students will learn about atoms and that atoms are made up of smaller particles Sample activities may include: ● Creating models of other representations of atoms ● Research the universe and its formation

EVALUATION OF STUDENT PROGRESS

Assessment Methods:
A variety of assessments will be used to measure students' progress including by not limited to formal lab reports, projects, presentations, quizzes, and summative tests and discussions.