Course Name: MESA Biology

Duration: ☐ 1 Semester ☒ Full Year

Grade Level: ☒ 9th ☐ 10th ☐ 11th ☐ 12th (check all that apply)

Are there any prerequisites for the course?

- Must have a GPA between 2.5-3.5.
- The student demographic needs to be an under-representative population in the STEM field.
- No science prerequisites.
- Meets the graduation requirement for a Lab and Algebra-Based Science.

WHAT this course is about:

The MESA program is designed to broaden participation and improve academic outcomes for underrepresented students in STEM education. MESA Biology is a year-long science course devoted to the study of living things and their processes. This course is designed to provide students with a biological foundation and help prepare students for advanced courses in the biological areas in high school and beyond. MESA Biology follows the Next Generation Science Standards. Additionally, in MESA biology, students will complete a project designed to solve a current world issue.

WHY take this course:

Biology provides a foundation in life science that helps us understand the living world and the ways it's many species function, evolve, and interact. Students develop an understanding of science concepts that prepare them for becoming contributing members of society as well as being prepared to advance to the next level of science in their high school pathway. Upon completion of biology students can choose a pathway that best fits their academic pursuits and/or needs. MESA biology provides students with additional resources and support for high school, college, and careers. The MESA program provides access to college and career pathways, scholarship opportunities, and college exploration trips. In MESA biology, students have the option to enter their project in a competition and compete for scholarships.

WHAT you'll learn:

- Conceptual understanding of a variety of concepts in Biology.
- Hands-on approach to learning, including science and inquiry.
- Critical thinking and problem-solving skills.
- Data collection, analysis and scientific writing.

WHAT you'll do:

- Participate in hands-on science investigations from guided activities to inquiry.
- Work collaboratively with others in a variety of thinking, processing, and hands-on activities.
- Create a project that will solve a problem within the community.

WHERE this could take you:

A successful biology experience prepares you for chemistry which is known as the central science because we use the foundations of chemistry in all other science disciplines. You can choose to continue with MESA General Chemistry or Honors Chemistry if you are looking for more challenge (Honors Chemistry goes a little faster, farther, and deeper than General Chemistry). Students who struggle in Biology or don't feel that they have the math background that they need for General Chemistry can choose to take Environmental Chemistry which provides a more conceptual experience. The laboratory activities, along with data analysis and science writing, are essential skills that will help students regardless of their future plans. Once a MESA student, you are always a MESA student and will be able to access additional resources in college, too!

OPTIONAL Course Outline ("scope and sequence", sequence chart, etc.)

General Biology Learning Topics

- Scientific Methodology and Experimental Design
- The Atom, Properties of Water and Water/Carbon Cycles
- Carbon Compounds and Enzymes
- Biological Hierarchy, Characteristics of Life, and Feedback Loops
- Cell Structure, Function, and Transport
- Cell Energy – Photosynthesis and Respiration
- The Cell Cycle and Division – Mitosis and Meiosis
- DNA Replication and Protein Synthesis
- Mendelian Genetics
- Evolution – History of Life, Darwin, and Evolution of Populations
- Ecology – Energy Flow, Ecosystems, and Communities