Physics Disclosure (Syllabus)

I. COURSE: Physics (Instructor: Jay Marshall, M.D.)

II. COURSE OBJECTIVES:

The standards and objectives for this course are provided by the Utah State Board of Education in the document Core Standards for Science, which can be found at https://www.schools.utah.gov/file/a1612aa6-e4aa-41d6-90d2-28678815c28c. I have also placed a copy of this document on my website www.dmarscience.comin the Physics Section. In accomplishing these objectives it will be my intent to provide the student with multiple conceptual frameworks for the study of physics that will allow the them to (1) organize the content they will be learning in a logical, consistent, and retrievable manner, and which (2) will promote the development of critical thinking skills and the use of scientific inquiry as an approach to the natural world.

III. TEXT: There is no official text for this course. Instructional materials will be provided either before or at the time of the corresponding discussion (see V. Course Management for further details).

IV. COURSE OUTLINE: The following course outline includes but is not limited to coverage of the Utah Core Science Standards (the number of the standard/objective covered follows the topic in parentheses)

(0) Unit 0: Orientation
- (0-1) Orientation to the Class: The Structure of Physics

(1) Unit 1: Motion in One Dimension (Kinematics)
- (1-1) Frames of Reference—Position, Displacement and Distance (St 1/Obj 1: 2; St 1/Obj 3:1-3)
- (1-2) Rate of Motion—Average Velocity (St 1/Obj 1:1, 3, 4)
- (1-3) Rate of Change of Motion—Acceleration (St 2/Obj 1-4)
- (1-4) Describing Motion Mathematically (St 2/Obj 5)
- (1-5) Problem Solving (St 2/Obj 5)
- (1-6) Falling Objects (St 2/Obj 5)
- (1-7) Describing Motion Using Graphs (St 1/Obj 1:5)

(2) Unit 2: Motion in Two Dimensions
- (2-1) Trigonometry Review
- (2-2) Linear Motion in Two Dimensions—Vectors and Vector Addition (St 2/Obj 1: 2)
- (2-3) Projectile Motion
- (2-4) Relative Motion

(3) Unit 3: Forces (Dynamics)

(3-1) Newton's Laws (St 2/Obj 1-3)
(3-2) Problem Solving (St 2/Obj 1-3; St 6/Obj 1)
(3-3) Weight (St 3/Obj 1:1-2)
(3-4) Friction
(3-5) Motion Down an Incline

(4) Unit 4: Circular Motion and Gravitation

(4-1) Uniform Circular Motion—The Kinematics
(4-2) Uniform Circular Motion—The Dynamics
(4-3) Curves
(4-4) Universal Gravitation (St 3/Obj 1:1-5)
(4-5) Satellite Motion
(4-6) Kepler's Laws

(5) Unit 5: Work and Energy

(5-1) Work and the Work Done by a Constant Force (St 6/Obj 3)
(5-2) Kinetic Energy and the Work-Energy Theorem (St 4/Obj 1:2)
(5-3) Potential Energy-Gravitational (St 4/Obj 1:1; Obj 2; Obj 3)
(5-4) Potential Energy-Elastic (St 4/Obj 1:1)
(5-5) Other Forms of Energy
(5-6) Power (St 6/Obj 3)

(6) Unit 6: Momentum

(6-1) Description of Momentum and its Relationship to Force (Impulse-Momentum) (St 6/Obj 2)
(6-2) Conservation of Momentum (St 6/Obj 2)
(6-3) Collisions—Elastic and Inelastic (St 6/Obj 2)
(6-4) Problem Solving Using Conservation of Momentum and Energy (St 6/Obj 2)

(7) Unit 7: Thermal Energy

(7-1) Thermal Energy, Transfer of Thermal Energy and Temperature (St 4/Obj3:2; St 6/Obj 4)
(7-2) Calorimetry (St 6/Obj 4)

(8) Unit 8: Oscillations

(8-1) Simple Harmonic Motion
(8-2) Springs and Mass Spring Systems
(8-3) Graphical Representation of Simple Harmonic Motion
(8-4) Simple Pendulum

(9) Unit 9: Mechanical Waves and Sound

(9-1) Features of Wave Motion and Relationship to Energy (St 5/Obj 1:1, 3-6)
(9-2) Interference and Standing Waves (St 5/Obj 1:2)
(9-3) Other Properties of Waves: Diffraction and Refraction (St 5/Obj 1:2)
(9-4) Sound

(10) Unit 10: Electrical Energy

(10-1) Electric Charge and Its Conservation (St 3/Obj 2)
(10-2) Forces Related to Electrical Charge (Coulomb's Law) (St 3/Obj 2)
(10-3) Circuits (St 6/Obj 5)

(11) Unit 11: Magnetic Energy and Its Relationship to Electrical Energy

(11-1) Magnets and Magnetic Fields
(11-2) Relationship between Electric Current and Magnetic Fields
(11-3) Electromagnetic Waves and Their Production (St 5/Obj 2)
(11-4) The Electromagnetic Spectrum (St 5/Obj 2)

V. COURSE MANAGEMENT:

This course occurs during periods A2 and B5.

Required Materials—

-Please obtain a three ring binder, (preferably a two to three-inch binder) **to be used just for this class**—this binder should contain sections for class notes, homework, and laboratory handouts.

-Scientific calculator which can easily perform calculations with square roots, positive and negative exponents, logarithms, and parentheses. You can use your phone for this in class but it may not be used as a calculator on tests.

Participation/Lecture— **Class notes** for lectures will be regularly provided as handouts but will also be available on my web site (www.dmarscience.com). These will usually include blanks to be filled in during lecture time so it is my expectation that the student will have these notes available at all times during class. I will check these notes daily and award up to 10 participation points per class period based on completion of these and other class time assessments. If a student misses a class period they will be excused from the responsibility of participation, but will not be excused from the responsibility of the material covered. The student may obtain notes from a fellow student or from my website. "I was not here that day," will not be a valid excuse for not obtaining information covered on tests or homework.

Questions of the Day (QOD's) At the beginning of many lectures I will ask a **question of the day** based on the previous day's lecture. These will be worth five or more

points. **Many of the QOD's will not be planned in advance and so will not show up on the school grading system ahead of time—so, it will be important for the student to take note of an upcoming QOD and not forget to review the concept before class the next day.**

Labs—Lab activities will be dispersed throughout the course of the year and will be hands-on experiences related directly to the content being taught at the time. Some activities will be designed mainly to demonstrate certain concepts and will fit in the context of the lecture, while others will be actual investigations requiring lab write-ups. For investigative labs a lab handout will be provided containing any information required to conduct the lab, including a procedure and space for results. The handouts will also include questions to be answered and space to write a conclusion. The write-up will be due the class period following the lab activity. Returned lab handouts should be maintained in the student binder. Points will be given for both participation and completing the handout. Depending on the nature of the lab activity, in total the lab may be worth up to 50 points.

Homework—Homework packets will be provided at the beginning of each unit. We will discuss many of the questions in the packet in class, while others will be assigned. Completed packets will be due two class periods before the corresponding test, at which time a completed answer key will be made available as a study tool for the test.

Tests—Tests will generally occur at the end of every unit, or more frequently if the unit is long. Tests will always be worth 100 points and will contain a multiple choice/matching section and a written problem section. Quarter and semester finals will be comprehensive. The test will largely be drawn from the homework sets so the homework set answer key will be the main study tool, with some guidance as to which areas to focus on. A thorough study guide will also be provided for each test

Quarter Grade

In this course the focus is on mastery of the material. As such, tests will be worth 50% of the grade; questions of the day, 10%; laboratories, 10%; homework packets worth 20%; and participation worth 10%. The quarter grade will be determined based on the percentages outlined by school policy.

Class Rules

It is my hope and intent that classes will always be conducted in an atmosphere of mutual respect and that there will never be a need for disciplinary action. However, should the need occur, such action will follow the guidelines set forth in the School Policies. My classroom policies include:

(1) Maintain a learning environment that is free of distraction.

Students should refrain from distracting other students from learning, or from disrupting the flow of instruction through excessive talking, noise or physical activity.

(2) Language and topic of conversion must be appropriate.

Swearing, vulgarity, and discussion of objectionable actions or words of others, or descriptions of objectionable material from TV shows, movies, and other media is not acceptable, even if you are only repeating the words of others. Forms of swear words that are intended as replacements for the actual swear word are also discouraged—especially any replacement of the "f" word. Additionally, any form of sexual innuendo, intended or unintended, is not acceptable.

(3) Respect everyone.

Disrespect of staff or of other students in any form is not acceptable. This includes any and all forms sexual harassment and racial, ethnic, or lifestyle stereotyping or slurring.

(4) Electronic devices are to be used only for educational purposes.

The use of electronic devices is encouraged for educational purposes. However, if I see use of a cell phone, music player of any type, or any other electronic device which is being used for non-educational purposes, and which, in my opinion, is providing a distraction for you or others, I will take the device until the end of class. For repeated offenses, the device may be taken to the office to be picked up by your parent. In addition, only materials necessary for conducting class will be allowed on desktops during class time.

(5) The only ingestible substance that may be brought into the room is water.

No food or beverages of any kind except for plain water will be allowed in the classroom unless for medicinal purposes (for example, cough drops). This includes mints, candy and gum.

<u>Consequences</u>

Depending on the nature of the infraction, I may issue a warning, a detention, or office referral. If I have to address continued infraction after a warning this will automatically result in a detention. If I have to address the issue a third time I will refer you to the office.

<u>Leaving the Room During Class Time</u>

If you need to leave the room during class time (restroom, drink, or locker for materials—**you will not be allowed to go to your car, so don't ask**), you do not

need to interrupt the flow of the activity. Just get up, go to the provided clipboard, fill in your last name, where you are going, and time leaving. Take the room pass and go where you need to go, keeping the absence from the room to as short a time as possible—there should be no reason for you to be out of the room for more than five minutes. Upon return, sign in the time returned. Only one person may leave the room at a time. The number of times a student leaves the room will be monitored and access to this privilege will be limited it appears that a students use of it is becoming excessive.

Tardy Policy

If you enter the room after the bell rings please sign in on the sign-in form provided, including last name, date, and period. If you have a valid pass from the office or a teacher excusing you for being late, check the box indicating this and leave the pass in the container provided (a call or email from a teacher will also suffice). If you do not have such a pass I will mark you tardy and you will incur consequences according to school policy. If an unexcused tardy causes you to miss a question of the day you will not be allowed to take that QOD.

Absences/Late Work/Missed Test Policy

It is to your benefit to be present in class. Unexcused absences will incur consequences according to school policy. Work may be turned in late for full value only under the condition of an excused absence. Any work due on the day of the absence is due the class period you return or it will be considered late. Homework is due at the beginning of the assigned class period. You cannot complete it during that class time or get it to me at the end of the day—it will still be considered late. If the homework is completed but you left it at home it will still be considered late. However, late work can be turned in to me at any date after the due date until the corresponding test for a maximum of 85% of the original point value. If you are absent the day of a test/quiz you will either complete the test/quiz outside of class time prior to the next class, or in class on the day of your return, whichever happens first. Depending on the circumstances of the absence (for example, an extended illness) these rules may be modified at my discretion. Because tests are announced in advance and I provide thorough study guides, you will not be excused from taking a test on the day it is given if you miss the class period immediately preceding the test.

VI. INSTRUCTOR AVAILABILITY

Students can meet with me during flex time or most nights after school. You may also contact me as necessary through the school email, jmarshall@sahs1.org. **If you are struggling please do not hesitate to get help. I am committed to your learning!**