Fall 2023-24 Policies & Syllabus Mr. Holloway

Welcome to Conceptual Physics!

What is it?

Physics is the study of the physical rules of the Universe. More specifically, Physics includes the study of forces, motion, mass, and energy, and the laws that underlie them. In order to understand Biology, one must understand the complex chemical reactions that constitute life. In order to understand Chemistry, one must understand the forces that govern mass which create the atoms that bond together to form substances. Physics studies what rules govern everything from the tiniest sub-atomic particles to the largest galaxies, and even deeper questions such as what gives matter mass, how mass and energy are related, what is space, and what is time. Indeed, Physics explores the very nature of reality. **Quite simply, Physics is the foundation upon which all other branches of science are built.** *In other words, Physics Rules!!*

Specifically, in this course we will explore the following topics: ***Forces and Vectors, Linear Motion, Projectile Motion, Momentum, Energy, Thermodynamics, Gravitation, Electric & Magnetic Fields, Vibrations and Waves, Light and Color.*** How far we actually get will depend on the needs of our class within the limits of the semester schedule.

How will we study it?

This college-preparatory course will closely follow the *Conceptual Physics* curriculum which is built upon the text of the same name by Paul Hewitt. Hewitt is well-known for his ability to write clearly and simply about the physical world.

The course is fast paced and highly **collaborative** in nature. We will do many **relevant** lab and hands-on activities. You'll need to work **respectfully** within the class **community**. We use our textbook often, in small chunks. Be prepared for homework each night. Be prepared to keep an organized notebook, and to do a good amount of writing and mathematical problem-solving. As students in a college-preparatory course, I will expect *you* to accept primary **responsibility** for your own learning and behavior. All of this fits right in with **our school's core values of Respect, Responsibility, Relevance, and Community**.

Critical Performance Indicators

In addition to your course grade, you will also be expected to earn a description of "proficient" or "exemplary" for the following performance indicators:

1. Asking questions: What do you wonder?
2. Constructing Explanations: What do you think?
   a. Developing and using models
   b. Computational thinking; using mathematics
3. Planning and Carrying Out Investigations: How do you investigate?

A few words about math

It has been noted since ancient times that there is a mathematical nature to physical reality; indeed, Pythagoras (of "theorem" fame) once said "*numbers rule the Universe*." All physical laws can be quantified, or expressed in numbers. This not only allows us to see order and patterns that exist in our Universe, but to make accurate predictions about future (and past) states. The weakness of our text (although some consider it a strength) is its lack of rigorous mathematical computation practice sets. We will use supplemental practice sets to give everyone ample opportunities to use some basic trigonometry, and to manipulate formulas to analyze and solve problems related to real-life examples. It is assumed that students in this course have high school level mathematical proficiency, and are comfortable with algebraic and geometric formulas, rules, and manipulations. **Expect to do a significant amount of mathematical problem-solving!**

About your teacher:
Mr. Holloway grew up just across the river in Alstead, NH and graduated from Fall Mt. Regional High School long before you were born. He earned a B.A. from Boston University, and a M.S. in Environmental Science from Antioch New England. He has been teaching at BUHS for over 25 years and was a middle school science teacher for 3 years prior to that. He also has experience teaching teachers Meteorology, Earth Science, and Physics for the American Meteorological Society and the University of Massachusetts. Mr. Holloway lives in Brattleboro with his son. When not doing sciencey things he is active in local community theater. He enjoys referring to himself in the 3rd person.

Physics Course Policies

Course Materials: What you need to be prepared and succeed each day:

- □ **You'll be loaned one copy of the text: *Conceptual Physics* by Paul Hewitt**. This book will be your most important resource. Keep it well covered at all times. Please note that you are assuming responsibility for this textbook; if it's lost or damaged you'll be billed $85.
- □ **A charged Chromebook.** This is not an online course, but there will be online activities and resources you will need to access in class.
- □ **You are required to maintain a 3-ring binder** along with dividers which can be labeled specifically for this course. **Inside this binder you must have a spiral bound notebook** for your lecture and text notes. All your work must be kept organized in this: organization is a key to success (and will be part of your Habits of Work grade)!
- □ **Lined paper** for writing assignments. I have some if you need it.
- □ **Pen and/or pencil** with you at all times. Pens should be blue or black ink (points will be deducted for other colors). I do encourage you to use a laptop computer or iPad if you have one.
- □ **Scientific calculator with trigonometric functions (recommended).** I have a limited number of them to loan (you may need to wait in line), but if you are college bound, you really *should* invest in one; besides, you can generally buy one for less than $20! **You may not use your phone/tablet calculator on tests or quizzes!**
- □ Remember, **cell phones and music players are to be turned off and kept out of sight.** Ear buds must be out of your ears – I consider them disrespectful when your attention should be on class. Failure to do so may result in confiscation and/or administrative referrals.
- □ **For safety, no food or drink are allowed in the lab space.**

Conduct

- □ This is an upper level, challenging, college-preparatory course, so I know I can rely on each of you to conduct yourselves well. **Any behavior that interferes with our learning will not be tolerated, and will be addressed immediately.**
- □ Every human being in this class with you deserves respect – even if they are very different from you. I expect you to **respect one another, work together, and keep other's interests in mind**. I can tell you from experience that kindness and an open mind are always rewarded in life.

Safety

- □ **Safe lab practice is of primary importance.** Prior to each lab we'll review any specific safety issues. You are expected to complete and understand any pre-lab work before participating in lab activities.
- □ **Any horseplay, misuse of equipment, or unauthorized lab activity will be severely dealt with.** Penalties range from a loss of lab privilege for the day (meaning a 'zero' for that lab which cannot be made up) to possible removal from the course.

Attendance

- □ Be here and **ready to go** when class starts! That means conversations done and materials out.
- □ If you must be late, try to create as little distraction as possible. Place your pass on the front desk, and I will note it later. If you do not have a pass, write your name and the time you entered on your own

piece of paper, and place it on the front desk. This is <u>your</u> responsibility, and insures that the UNV will be changed to a TARDY rather than a CUT.

- □ **Frequent absences <u>for any reason</u> are likely to have an adverse effect on your learning and your final grade in this course.** Classroom instruction, discussions, lab activities, and guided practice provide the foundation for learning during subsequent days, weeks and months. ACE period and other make up sessions do not fully replace a block of dynamic classroom or lab experience.
- □ We follow the BUHS attendance policy. You can find it in your Student Handbook, along with the disciplinary actions taken if not followed. Some simple advice:
    - o Being late regularly leads to a lower participation grade and possible disciplinary action.
    - o Cutting class leads to a zero for the day (even if it's a test!) and a teacher detention. The hassles only increase with additional cuts.
    - o Go beyond 10 undocumented absences, and you can't get higher than a grade of 60 for the course. (School policy)
- □ You need to **sign out and take a pass** if you're going to leave the class. I will allow **one student to use the rest room at a time**. I may ask you to leave your phone with me

Grades

- □ Your "grade" in all courses at B.U.H.S. now has three components: a course grade, identified critical performance indicators, and habits of work.
- □ **Your course grade for each marking quarter** will be roughly:
    - o **50% unit tests –** retakes will be available as per our department's retake policy (see policy below)
    - o **50% graded assignments – This includes assignments scored on proficiency rubrics, lab work, lab reports, projects, quizzes, and any other graded assignments done in class or as homework**. Each graded assignment is given a point value, and this grade is a percentage of points earned to total possible points.
- □ Graded assignments that do not have their own rubric will be assessed using a general assignment rubric (see attached).
- □ A **comprehensive final exam** will account for **15 - 20% of your <u>overall</u> grade for the semester**.
- □ **Vermont requires all students to demonstrate proficiency in a number of content areas in order to graduate.** This course will address proficiency in Science and Engineering Practices relating to Physics (see p.1). These have been embedded in the course and will be reflected in a traditional academic grade. **If you pass the course, that means you have demonstrated proficiency as defined by those indicators.**
- □ **You will also receive a Habits of Work (HOW) grade** based on a four-point scale, where a '3' is proficient, and is assessed in each class using a rubric. This grade affects your eligibility for extra-curricular activities (sports, plays, clubs, etc.)
- □ <u>Questions about your grade will be addressed during ACE, office hours, or by appointment.</u> Do not expect to have any but the briefest conversations about grades in class.
- □ **If you come prepared and do your work each day (including homework), you <u>will</u> pass.** That said, this is a rigorous, challenging course: **<u>a high grade ("A") means that you have demonstrated a substantially high level of knowledge of the subject matter and can apply that knowledge</u>** <u>in a successful and meaningful way in a variety of situations.</u> **<u>This is not an effort grade</u>**.

Chromebooks, electronics, and electronic assignment submissions

- **Chromebooks or other devices should be closed and off unless I have given you permission to use it for a classroom task.** It is NOT to be used in class for personal web browsing, checking e-mail etc.
- **All electronic assignments must be submitted via Google Classroom as a single document** per assignment. For example, a lab report may contain a pre-lab, data tables, graphs, images, etc. All of the above parts assignment must be embedded into one document with the assignment name. I should not have to open multiple files to collate your lab report for you!
- **You may not turn in an assignment by simply sharing a Google Document with me.** Unless it is submitted through Google Classroom, I will not give it credit.
- I should be notified of anything submitted late via Google Classroom by e-mail. Don't assume that I will see that you shared something after the due date.
- Do not expect to charge your electronic devices in my room – please take care of charging your devices at home. My lab tables are not charging stations!

Notebook

You are required to maintain a both a 3-ring binder for this course and a spiral notebook for taking class, lab, & text notes. Your binder should contain at least 2 tabbed and labeled sections: **(1) general course reference and information, and (2) class work & assignments**. The contents of this binder and notebook **will be assessed using a rubric and be part of the "Habits of Work" component of your grade.** Furthermore, maintenance of an organized notebook is a skill that will be important for future academic success. Bring your notebook with you to all class meetings.

Homework

- **There will be a nightly homework expectation** in order to either provide background information to help you be prepared for the next class, or to provide opportunities to practice and reinforce material we have covered. **You are responsible for knowing and understanding all concepts in the assigned readings. Unless you ask follow-up questions I will assume that we do not need to go over them again in class**.
- **All homework must be completed in order to be eligible to retake tests** (see retake policy).
- **Some homework is not graded individually, but it is reflected as part of your habits of work grade – and in how you do on tests and quizzes.** The learning in this course is often cumulative – it builds upon earlier concepts. **Keeping up with the homework will make you a better Physics student, which will impact the rest of your grades in this course**. There's much truth to the cliché that "*practice makes perfect*." Find a regular time and place to get it done!

Retake Policy

- On any unit test or project assessed using proficiency rubrics, any student who scores below 85% or below a proficiency score of 3 may request a retake (test) or to revise their work (project).

- To be eligible for a retake or revised project grade, a student must first:
  - Complete all assignments related to the test or project: All graded assessments and out-of-class work assigned within the unit of study must be satisfactorily completed.
  - Schedule the Retake: Students have two school days to schedule the retake or revision with the teacher. The retake must happen within ten school days of the original assessment or by the end of a marking period (the day grades close), whichever is sooner.
  - Review the original attempt: Teachers may require students to make test corrections and/or attend a test review session prior to retaking a unit test or revising project work.
- The **retake grade becomes the final grade** for the test or project -- **even if it is lower** than the original grade. Multiple retakes or revisions are only available at the teacher's discretion.
- **Final exams and final projects are NOT eligible for retakes and/or revisions.**

Makeup Policy and Late Work

- If you are absent, **making up what you missed is <u>your</u> responsibility**!
- Check the weekly agenda online for missed assignments, see Mr. Holloway for any missed handouts, and check with your classmates for missed notes.
- **Assignments missed during an absence are due as soon as you return** (example: if you're absent Monday and something was due, it is due when you return on Tuesday). **You will be given an extra day following your return to make up any new assignments** (for example: if you're absent Monday and return on Tuesday, get the assignment from Monday and hand it in by Thursday).
- **If you are absent on the day of a test or quiz, you will be expected to make it up during the next class period.**
- **There are many assignments and activities that cannot be made up on your own** outside of our lab space. You must schedule a time with Mr. Holloway to make up any missed lab work, tests, or quizzes. It is expected that you will do this promptly, before lab materials are no longer available. **Otherwise they become 'zeros'**, which no one likes!
- **Late work may <u>not</u> be accepted during the last week of each quarter** unless it is due to an excused absence or you have contacted me prior to the due date and discussed your difficulties. Late work will be graded when I get to it: do not turn something in the day before progress reports and expect it to be immediately entered into the gradebook.
- **If you submit (or re-submit) work after the original due date for any reason it is your responsibility to send an e-mail (or write a note) letting me know that you are doing so.** Do not expect me to be looking out for old assignments.
- **Make-up times:** before/after school and during ACE period.
- **If you miss class for disciplinary reasons**, you are expected to consult the agenda for any assignments, and work on whatever is coming due during your absence.
- **If you have an extended absence**, see me and we'll come up with a plan to get you caught up.

Academic honesty

- is <u>very important</u>. Study groups and cooperative work is encouraged, but any final product must be your own. Anything you give me with the expectation of receiving credit must be in your own words and reflect your own thinking. **Any plagiarized work – or work showing extreme similarity - will be marked 'zero' with no opportunity to resubmit. Note that if you allow your work to be plagiarized by others, you will also receive a zero.** If you are ever in doubt, please ask me <u>ahead</u> of time.

"ACE" Period

- I'll sign you up for ACE if I think your grade is below what it should be.
- PLEASE sign up to work on group projects, to complete individual assignments, or to get help or clarification with something, or if you were absent and need to make something up. I'll help!

Questions? Concerns? Need extra help? Talk to Mr. Holloway!

- **Don't ever hesitate to come see me.** That's why I'm here. Talk to me early and often.
- **Make use of ACE period when needed.**
- **Homework assignments and information are posted on Google Classroom** (classroom.google.com)**.** Add it to your bookmarks/favorites!
- **My office hours are after school 3:30 – 4:10 by appointment.**
- **If you or your parents/guardians ever need to reach me for any reason, my school phone number is (802) 451- 3744 and my email address is bholloway@wsesdvt.org**

Physics
Fall Semester, 2023-2024

"Physics is experience arranged in economical order."
-Ernst Mach
"If you can't explain it simply, you don't understand it well enough. "
-Albert Einstein
"The task is not to see what has never been seen before, but to think what has never been thought before about what you see every day"
-Erwin Schroedinger

CENTRAL COURSE CONCEPT: *Many phenomena in physics are two-way interactions. Forces, momentum, electric fields, gravity, etc., are all interacting ("two-way") phenomena.*		
Expected Units of Study (Content areas) & Focusing Questions ***Note: scope and/or sequence may need to be modified depending on time constraints.***		
	Introduction	*How does the scientific method, and mathematical thinking allow us to make discoveries that go beyond simple observations?*
I	**FORCES & INTERACTIONS** Mechanical equilibrium Linear Motion Newton's 2nd Law: a = F/m Newton's 3rd Law Momentum	*How can we describe, explain, and predict the motion - or lack of motion - of objects in a system?* *Indicators: 1h, 1i*
II	**ENERGY** Mechanical Energy (Potential & Kinetic) Temperature & Heat Thermodynamics	*What is Energy, and how does it move through the Universe?* *Indicators:2a, 2b, 2c*
III	**FORCE FIELDS** Universal Gravitation Electrostatics Electric Fields & Potential Magnetism Electromagnetic Induction	*What are force fields, and how do they act on particles at a distance through space?* *Indicators: 1j, 1k, 2b, 2d*
IV	**WAVES & ELECTROMAGNETIC RADIATION** Waves & Vibrations Light & Color Reflection & Refraction Special Relativity	*How do waves transfer energy, and send and store information?* *Indicators: 2e, 2g, 2h*