Welcome!
Phys 217
14427, 14428

"In **science**...novelty emerges only with ***difficulty***, manifested by resistance, against a background provided by expectation."

— **Thomas S. Kuhn,**

Santa Ana College
Fall 2022

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Phys 217
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"In **science**...novelty emerges only with ***difficulty***, manifested by resistance, against a background provided by expectation."

— Thomas S. Kuhn,

Translation: The *one weird trick* to learn physics is to try, struggle, discuss and ultimately solve physics problems. Lots of problems.

Welcome!

Lecture Instructor:	Dr. Alexander Natale
Email:	Natale_Alexander@sac.edu
Lecture:	**Tuesday/Thursday 2:50 PM - 4:15 PM** SC-113-1/2
Lab (14427):	**Wednesay 1:15 PM - 4:15 PM** SC-312
Lab (14428):	**Thursday 10:05 AM - 1:05 PM** SC-312

Prerequisites: Math 180/Math 180H

Office Hours

- Office hours will be held in my office in the Science Center Room 301-6B

Monday	Tuesday	Wednesday	Thursday
2:00 PM – 4:00 PM	11:00 AM – 12 Noon	10:00 AM – 12 Noon	1:30 PM – 2:30 PM

- I will also have contact hours in the Science Learning Center on Tuesday from **12 Noon to 2:00 PM**

Regarding COVID-19

HIGHLIGHTS:

- Masks are strongly suggested, not required
- If you have symptoms ***stay home (if you are sick stay home)***
- If you have a positive covid test ***stay home*** (5 days after + if you have -, 10 w/o a -)

In fact, if you are sick at all, I do suggest and will accommodate students who stay home.

If you miss class because were sick or tested positive:

- Contact me
- I will provide **alternative assignments** via Canvas/Email
  - Lecture slides, lab activities, worksheet alternatives, etc.

Waitlist Policy

Waitlist policy is:

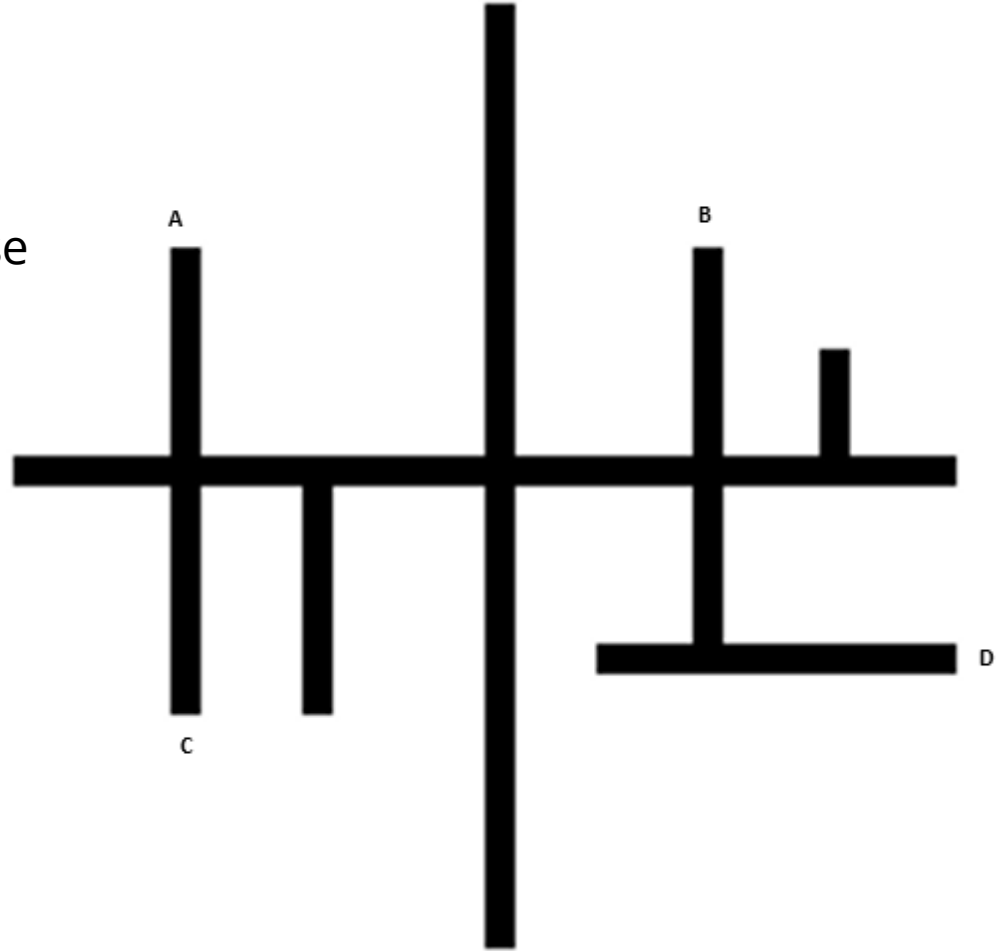
- if spots open in the class I will add students from the top of the waitlist.
  - You will have 24 hours to add the class. If you do not enroll I will go to the student next on the list.
- The list is chronological so students who tried to enroll will get added first.

Icebreakers

- Tell us who you are (preferred name)
- Tell us what your major is.
- Tell us the ***least*** interesting fact about yourself.

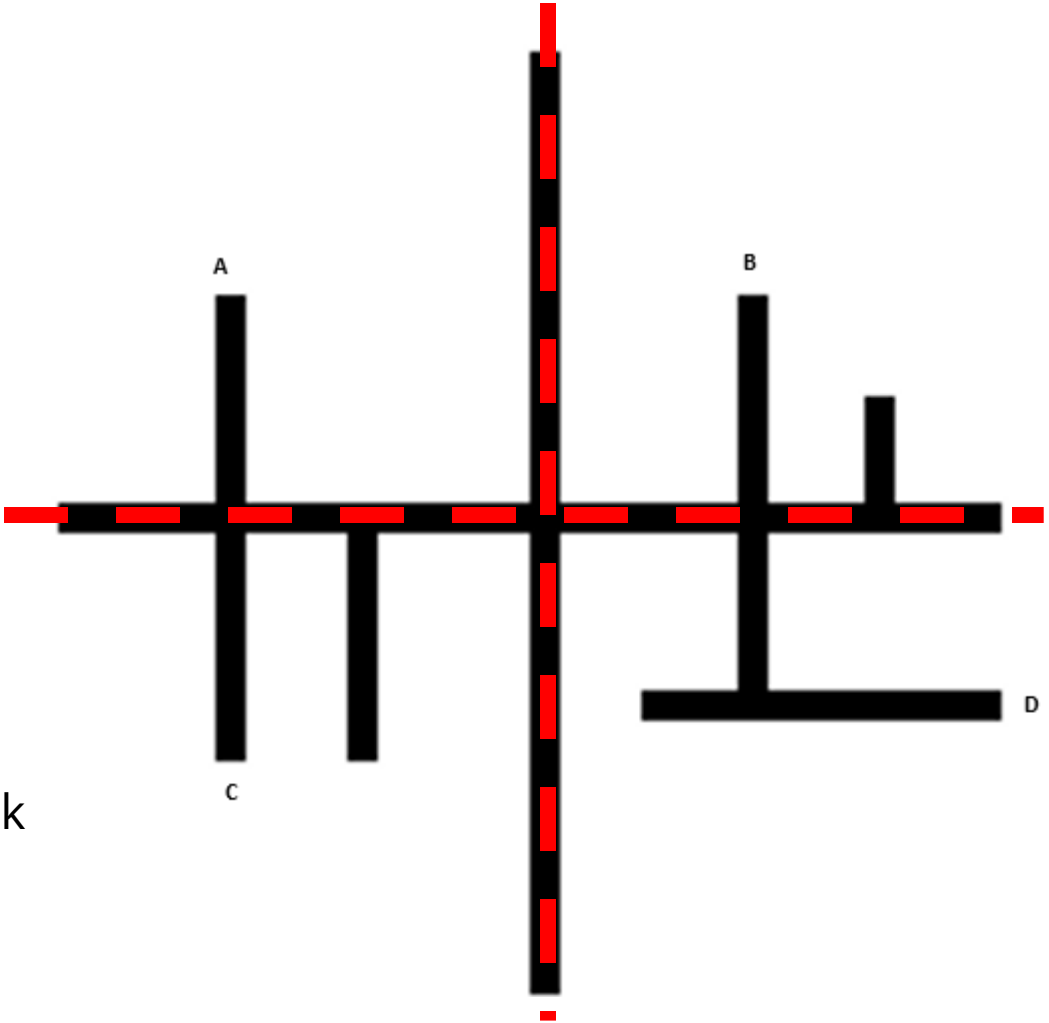
Clickers

- We will be using these handouts as clickers:



Clickers

- We will be using these handouts as clickers:
- To answer a question, fold along the dashed lines so
  A, B, C, or D (your answer) appears and hold that up as I tally the responses
- For “E” simply show the blank side of the paper



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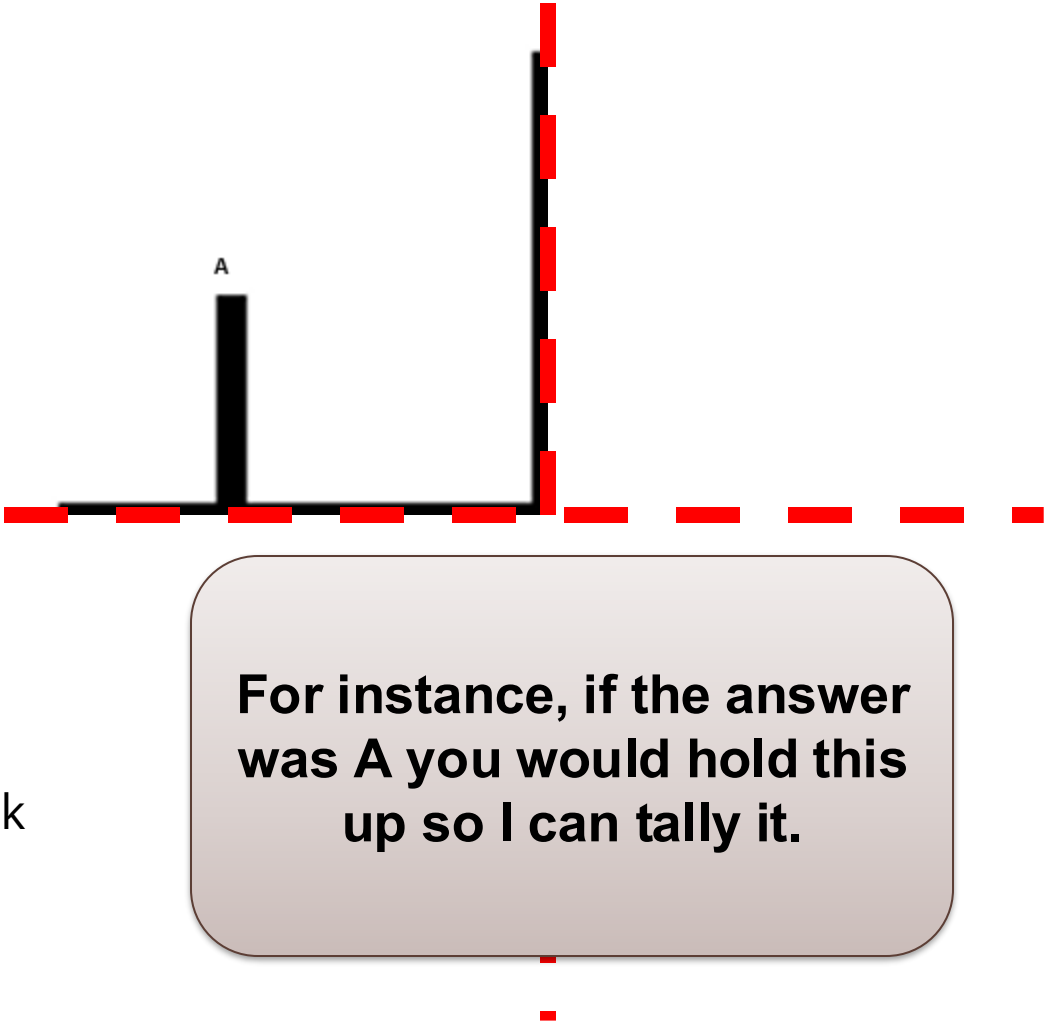


For instance, if the answer was A you would hold this up so I can tally it.

Clickers: let's try!

If you ***had*** to choose, which would you rather?

A. Everywhere you go you are 10 minutes late.
B. Everywhere you go you are 20 minutes early.

Clickers: let's try!

If you ***had*** to choose, which would you rather?

A. Your skin is covered in fur (any kind you choose).
B. Your skin is covered in scales (any kind you choose).

Clickers: let's try!

What season is your favorite?

A. Fall
B. Winter
C. Spring
D. Summer
E. No Favorite

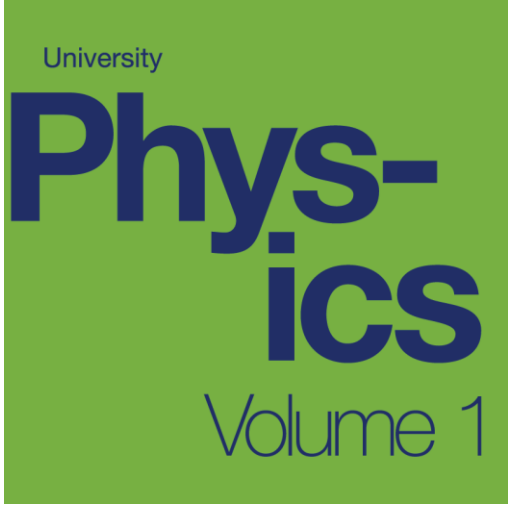
Course Description/Objectives

Course Description:
Principles of classical mechanics including particle dynamics, forces, work, energy, momentum, rotational motion, equilibrium, harmonic motion, and gravity. This course is designed for students majoring in physical sciences and engineering.

Course Objectives (Student Learning Outcomes):

- Students will be proficient at kinematics in 1D, 2D and 3D.
- Students will be proficient at use of the momentum principle (Newton's 2nd Law) and principle of reciprocity (Newton's 3rd Law) to solve varied problems ranging from a simple dropping of a ball to planetary orbits.
- Students will be proficient at the use of numerical methods to solve problems that have no closed form analytical solution such as 2D projectiles with air drag.
- Students will be proficient at using principles of momentum, angular momentum and energy and related conservation laws in nature for the sake of problem solving.

Required Materials



- We will be using the OpenStax.org University Physics textbook Vol 1.

- A scientific calculator or graphing calculator.
- A well-organized notebook to keep class notes, handouts, and returned & graded work.
- Access to an electronic device with internet capabilities to access Canvas.
- Excel (or equivalent like Google sheets) and Word (or equivalent like Google Docs) *see Canvas for links*

Recommended:

- Tracker Physics (https://physlets.org/tracker/)
- Symbolic manipulation program (such as Mathematica, Maple, MathCad)
- Schaum's Outline of Mathematical Handbook of Formulas and Tables, any edition.

Expectations

Regular participation is more than merely coming to a class held on campus. To collectively create a learning community, we each contribute to the environment, learn from each other, and set expectations and goals. To be more than people occupying space, we must participate. I will check in on you if you forget to participate, and if there is prolonged absence and I have not received any response, you may be dropped for non-participation in accordance with SAC policy. I understand that numerous technological, personal, and world circumstances can cause extra challenges for you, but my goal is for us to learn something valuable from each other this semester; to do that we need to communicate.

Expectations

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If you are having any issue impacting your coursework, please let me know!

us to learn something valuable from each other this semester; to do that we need to communicate.

Expectations

- Please attend and participate, these ensure we create a robust learning community
- Assigned work is for assessment and skill building, so please complete every assignment
  - Something is better than nothing; if you're running into issues please describe your problem, talk to me, and turn in whatever it is you have
- Student code of conduct are the minimal set of rules to produce a vibrant interactive space that is respectful and engaging; I expect we all will follow the standards of student conduct as outlined in the student handbook
- Electronic devices are allowed during lectures and lab as long as they are used in the interests of class work and are **not a distraction** (no recordings are allowed during class without my prior written consent).
- Only a scientific, or graphing calculator will be allowed during exams or quizzes. **No other electronics are allowed during exams or quizzes.**
- If you decide to drop the class, **you are expected to be aware of the drop date and are responsible to electronically withdraw yourself from the course.**
- If you are not participating, or not showing up, I will reach out to you; if I do not hear from you, ***you may be dropped before the census date (September 4th)***

Expectations

- Please attend and partici… …ing community
- Assigned work is f… …very assignment
  - Someth… …problem, talk to me, and turn in what…
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If you are absent from classes in the first week you may be dropped (no show drop). If there is some reason you cannot make it to a class or lab exercise in the first week ***please email me***

Academic Honesty

Students at Santa Ana College are expected to be honest and forthright in their academic endeavors. To falsify the results of one's research, to steal the words or ideas of another, or to cheat on an examination, corrupts the essential process by which knowledge is advanced. Academic dishonesty is seen as an intentional act of fraud, in which a student seeks to claim credit for the work or efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. As institutions, we also consider academic dishonesty to include forgery of academic documents, intentionally impeding or damaging the academic work of others, assisting other students in acts of dishonesty or coercing students into acts of dishonesty.

Academic Accommodations

- Your success in this course is important to me. Santa Ana College and I are committed to providing reasonable accommodations for all individuals with disabilities. If you have a disability that may have some impact on your ability to do well in this course, I encourage you to speak with me as soon as possible. Also, please contact Disabled Student Programs & Services so that we can all collaborate on your classroom accommodations in a timely manner. DSP&S is located in the **Johnson Student Center (JSC) 108**, and its phone number is **714-564-6295**. **Video Phone: 657-235-2999. Fax: 714-285-9619. Email: DSPS@sac.edu**. The DSP&S office requires documentation of your disability in order to receive reasonable accommodations. If you do not have documentation, they will work with you to acquire it. I look forward to supporting you to meet your learning goals.

Title IX

Title IX is a federal civil right law that prohibits sex discrimination in education. This includes sexual harassment, sexual assault, and rape. Violations of Title IX, as well as violence or threats of violence on campus or online, are taken very seriously so that victims are provided with proper support and violators are properly disciplined. As a faculty member, I am required by law to report all such violations. If you have been a victim of sexual misconduct and would prefer to talk to someone confidentially, I encourage you to take advantage of the psychological services offered at SAC's Health & Wellness Center. You can contact the Center at **(714) 564-**6216 or visit them in person in the **Johnson Student Center (JSC) 110**.

Campus Resources

- The SAC Health & Wellness Center (Links to an external site.) offers free health, wellness, and psychological services to currently enrolled

- The Neally Library (Links to an external site.) offers students assistance with research, citing sources, searching the Internet, and has access to periodical and reference databases.

- The SAC Student Services (Links to an external site.) website provides access to a wide range of useful information and services. Find out more about how Santa Ana College can help you! You will find information about:
    - Admissions and Records
    - Assessment Center
    - Career Center
    - Counseling
    - Disabled Students Programs & Services (DSPS)
    - Extended Opportunity Programs & Services (EOPS)
    - Financial Aid
    - International Students
    - Laptop Loaners
    - Santa Ana Promise Program
    - Scholarship Program
    - Student Life
    - Student Support Services Program
    - Student Peer Mentor Program
    - Transfer Center
    - Veterans Resources
    - Fainbarg Chase Thrive Center

Computer Resources

- The Academic Computing Center (Links to an external site.) (ACC), located on the 1st floor of the A Building, provides computer access in addition to free tutoring and other academic support services. Check out the ACC website to register for free services at all the SAC learning centers across campus.

- These additional Centers also include computer access:
    - Science Learn Center (SC-103)
    - Learning Center (D-307)
    - Nealley Library (L-1st floor)

Computer Resources (cont)

The Student Help Desk assists students with using our campus technology including: Digital Dons laptop loans (Links to an external site.), Microsoft Office 365 installation Sac.edu student email accounts (Links to an external site.), the SAC mobile app (Links to an external site.), WebAdvisor (Links to an external site.) and Self-Service (Links to an external site.), and Zoom (Links to an external site.).

The Student Help desk offers live chat (online) support.

Visit the Student Help Desk (Links to an external site.) website for more information and to connect to their services.

All active SAC students have access to a college email address and access to Microsoft 365 (Links to an external site.), free of charge. The Foundation for California Community Colleges also provides access to discounted software through CollegeBuys (Links to an external site.) for SAC students.

Study Resources

- Free tutoring assistance is available through online services and departmental and campus-wide resource centers. These include:
- The Academic Computing Center (Links to an external site.) (ACC) provides free tutoring, computer access, and other academic support services.
- The Learning Center (Links to an external site.) offers students free academic support, including DLA (Directed Learning Activities), tutoring, workshops, and more.

  To signup for the LSC Students will need to "add" the Supervised Tutoring section as directed below:

  1. Term: 2022SPN - Spring 2022 Continuing Ed
  2. Location: CEC – SAC Continuing Education
  3. Subject: Learning Support
  4. Course: LRN-095-12014 Supervised Tutoring (Science)

- The Math Center (Links to an external site.) offers students free math tutoring.
- The Science Center (Links to an external site.) offers students free science tutoring.
- NetTutor provides online tutoring assistance to students in online and hybrid courses.

Study Resources

- At the Science Learning Center there are additional tutoring options available for all physics students:

  Dr. Chakhad
  Monday 2:00 PM to 4:00 PM
  Wednesday 10:00 AM to 12:00 Noon

  Dr. Natale
  Tuesday 12:00 Noon to 2:00 PM

- NetTutor provides online tutoring assistance to students in online and hybrid courses.

Grading Policy

- All assignments will be graded out of five points based on the rubric (available on Canvas).
- The lowest possible score for an assignment is one point (even if you didn't turn it in).
- If there are multiple components on the rubric for a given assignment, the final score will be the average of the different sections of the assignment.
- You can be given points that are not whole numbers.
  - For example: 1.5, 2.8, or 4.2.
  - More commonly, I will use values like 1.5, 2.5, 3.5, or 4.5 for work that exceeds the rubric of one point group but does not quite meet the rubric of the next.
- Your final grade is *the average over all assignments*. That means your final grade will be out of 5 points.
- Points will only be assigned with two significant figures.
- The points are related to percentage values in the following way:

1 = 50% **2 = 62.5%** **3 = 75%** **4 = 87.5%** **5 = 100%**

Grading Policy

All grades will be maintained on Canvas. Unfortunately, Canvas does not easily allow for me to grade out of 5 points the way I want to, so ***grades on Canvas are uploaded as percentages.***

- A: 90 - 100
- B: 80 - < 90
- C: 70 - < 80
- D: 60 - < 70
- F: Below 60

Rounding policy: grades will be **rounded up to three digits when calculating grades.**

Assignment Categories

- **Homework sets (not graded)**
  - A set of assigned problems to practice and hone theoretical analysis skills in physics
- **Quizzes**
  - Each question is graded out of 1 to 5, then the final result is averaged, min grade is 1 = 50%
  - These will be handed out in the lab section before at the start of lab.
- **Labs**
  - There will be an exercise guiding you on what to collect.
  - You turn in a typed lab report before the next lab (on Canvas).
- **Exams (4x, non-comprehensive)**
  - These will occur during the lab times on Week 4, 8, 13, and 16

Homework

Homework will be assigned **online** (on Canvas), and ***IS NOT GRADED.*** Homework will consist of several physics problems similar to the problems that appear at the end of relevant chapters of the textbook.

Working with classmates on homework assignments is encouraged.

Lab Reports/Guidelines

- Lab report rubrics and guidelines for lab exercises will be provided on the first lab meeting
    - There will be several categories, each graded out of 1 through 5.
    - The final grade for any one lab assignment is the average of all the different categories.

- Lab Exercises will be provided on Canvas

Missing Deadlines

Any assignment that is turned in more than 7 days late may not be graded (it is up to my discretion).

If it is not graded, it will receive the minimum grade of 1 = 50%.

The last day to turn in *any* late work is **December 8th**

Exams & Re-writes

- Exams will take place during the lab period of weeks 4, 8, 13, and 16:
  - Each is non-comprehensive (covering the material between exams only)
  - You will be given access to scratch paper and equation sheets
  - You are allowed to use a calculator
- After graded exams are returned, you will be able to correct, or “re-write,”problems to recover points you lost (due two weeks after the exam, in lecture)
  - This will only apply to Exams 1-3 due to the schedule of the semester
  - You should use words to describe your process, both the correct process and where you went wrong on your previous attempt, as well as including all steps for calculations
  - You can up to 75% of the points you lost

Exam Schedule

1. **Exam 1** will be held during the lecture time in SC-312 on **September 15th**
2. **Exam 2** will be held during the lecture time in SC-312 on **October 13th**
3. **Exam 3** will be held during the lecture time in SC-312 on **November 17th**
4. **Exam 4** will be held during the lecture time in SC-312 on **December 8th**

Tentative Schedule

- September 4th: Last date to drop without a "W"
- November 11th: Veteran's Day (NO CLASS)
- November 13th: Last day to drop with a "W"
- November 24th – 27th: Thanksgiving (NO CLASS)

Week	Dates	Topics	Lab
1	23-Aug	Intro, Units, and Measurements	Lab 1
	25-Aug	One-dimensional Motion	Measurements and Vectors
2	30-Aug	One-dimensional Motion	Lab 2
	01-Sep	Newton's Laws	One Dimensional Motion
3	06-Sep	Newton's Laws	Lab 3
	08-Sep	Newton's Laws	Newton's Laws
4	13-Sep	**Exam 1 Review**	Lab 4
	15-Sep	**Exam 1**	Newton's Laws with Friction
5	20-Sep	Two-dimensional Motion	Lab 5
	22-Sep	Two-dimensional Motion	Projectile Motion
6	27-Sep	Work	Lab 6
	29-Sep	Work	Projectile Motion with Air Resistance
7	04-Oct	Potential Energy and Conservation	Lab 7
	06-Oct	Potential Energy and Conservation	Work-Energy Theorem
8	11-Oct	**Exam 2 Review**	Lab 8
	13-Oct	**Exam 2**	Conservation of Energy
9	18-Oct	Impulse, Momentum, and Collisions	Lab 9
	20-Oct	Impulse, Momentum, and Collisions	Impulse and Collisions
10	25-Oct	Rotational Motion	Lab 10
	27-Oct	Rotational Motion	Rotational Inertia
11	01-Nov	Dynamics of Rotation	Lab 11
	03-Nov	Dynamics of Rotation	Ballistic Pendulum
12	08-Nov	Equilibrium & Elasticity	**No Lab**
	10-Nov	Equilibrium & Elasticity	**Holiday**
13	15-Nov	**Exam 3 Review**	Lab 12
	17-Nov	**Exam 3**	Conservation of Angular Momentum
14	22-Nov	Universal Gravitation	**No Lab**
	Holiday	**No Class**	**Holiday**
15	29-Nov	Periodic Motion	Lab 13
	01-Dec	Periodic Motion	Kepler's Laws
16	06-Dec	**Exam 4 Review**	
	08-Dec	**Exam 4**	**No Lab**