

**Course Syllabus: UNIVERSITY PHYSICS 1: PHYS 1624**  
**McCOY College of Science, Math and Engineering**  
**Midwestern State University**  
**Section 301**  
**Summer 2026**

**Contact Information**

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**Course Description**

This course is designed in such a way that the students get a basic but thorough introduction to the concepts and principles of physics. This will enable them to build up their skills and help them in the other higher level physics courses.

**Textbook & Instructional Materials**

Physics for Scientists and Engineers-A Scientific Approach, Randall D. Knight.:  
The e-text should be accessible through your D2L course webpage.

**Topics to be covered in class:**

**Newton's Laws, conservation Laws and Applications of Newtonian Mechanics**

- Concepts of Motion
- Kinematics in 1-D
- Vectors and Coordinate Systems
- Kinematics in 2-D
- Forces and Motion
- Dynamics 1
- Newton's 3<sup>rd</sup> Law
- Dynamics 2
- Work and Kinetic Energy
- Interactions and Potential Energy
- Impulse and Momentum
- Rotation of a Rigid Body
- Newton's Theory of Gravity
- Fluids and Elasticity

**Oscillations and Waves**

- Oscillations
- Traveling Waves
- Superposition

## **Thermodynamics**

- Macroscopic Description of Matter
- Work, Heat and the First Law of Thermodynamics
- The Micro and Macro Connection
- Heat Engines and Refrigerators

### **Study Hours and Tutoring Assistance**

If you need physics tutoring, please contact the library. They have a list of physics tutors.

### **Student Handbook**

Refer to: [Student Handbook](#)

### **Academic Misconduct Policy & Procedures**

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work, not the individual to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct. [Office of Student Conduct](#)

### **Moffett Library**

Moffett Library provides resources and services to support student's studies and assignments, including books, peer-reviewed journals, databases, and multimedia materials accessible both on campus and remotely. The library offers media equipment checkout, reservable study rooms, and research assistance from librarians to help students effectively find, evaluate, and use information. Get started on this [Moffett Library webpage](#) to explore these resources and learn how to best utilize the library.

### **Grading**

Course Grade – The assignments, tests and final exam will be graded by assigning a maximum of 5 points to each question. Each assignment will have 5-6 questions. Each test will have 5-6 questions. The final exam will have 6-10 questions. The total points of the assignments, tests and final exam will then be adjusted based on the points allocated to each of the above based on the distribution mentioned below in Table 1. Each lab will be worth 100 points each. At the end of the semester, the average of all the labs will be taken and the total points will be adjusted based on the distribution as mentioned in Table 1. There will be one class presentation and it will be worth 5 points. The total points will be adjusted based on the distribution mentioned in Table 1.

Table 1: Points allocated to each assignment

Graded Content	Points
Assignment1	10
Assignment 2	10
Test 1	15
Test 2	15
Presentation	5
Lab	20
Final Exam	25
Total Points	100

Table 2: Total points for final grade.

Grade	Points
A	90 to 100
B	80 to 89
C	70 to 79
D	60 to 69
F	Less than 60

### **Assignment and Test Rules**

- Assignment 1, Assignment 2 and the Presentation must be done in the assigned groups. The information about the groups will be given in class and uploaded on d2l.
- Any assignment which is not done as part of the group will receive a zero.
- Every member of the group must be satisfied with every member's contribution.
- Test 1 and Test 2 must be done individually without any collaboration.
- Final exam must be done individually without any collaboration. Failing to turn in the final exam will result in failing the course.

### **Mid-Term Exam**

Test 1 and Teast 2 will count as mid-term exams

### **Final Exam**

Final exam will be comprehensive and will consist of 6-10 questions. The date of the final exam is mentioned on the [Academic Calendar](#).

### **Extra Credit**

Extra credit work may be offered based on the discussions in class. It will be uploaded on d2l.

### **Late Work**

Penalty for late work is 10% of the total grade each day.

## Make-up Work/Tests

Make-up work will be discussed in class and will be uploaded on d2l.

## Important Dates

Last day for term schedule changes: Check the date on the [Academic Calendar](#).  
Deadline to file for graduation: Check the date on the [Academic Calendar](#).  
Last Day to drop with a grade of "W:" Check the date on the [Academic Calendar](#).  
Refer to: [Drops, Withdrawals & Void](#)

## Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

## Attendance

- Although attendance is not a part of the grading scheme but participation in class is, so classes should be attended regularly if the student wants to get a good grade. There may be short surprise quizzes during the lectures (not more than 5 in a semester) to test the learning of a student and the grades of these quizzes may be a part of the participation grade. The participation points cannot be made up (not even by excused absences)
- Students may lose participation points for coming late to class.
- In case of an absence from class, a student may make up the an assignment and /or a test grade if the student has an excused absence. An excused absence should always accompany a document or note from an authorized individual or group. Some excused absences include University sponsored events (showing a document or note from authorized personnel), illness (showing a doctor's note), demise of a family member. It is always better to inform the instructor beforehand in case of a legitimate and planned absence.

## Online Computer Requirements

Taking an online class requires you to have access to a computer (with Internet access) to complete and upload your assignments. It is your responsibility to have (or have access to) a working computer in this class. ***\*Assignments and tests are due by the due date, and personal computer technical difficulties will not be considered a reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings.*** Computers are available on campus in various areas of the buildings as well as the Academic Success Center. ***\*Your computer being down is not an excuse for missing a deadline!!*** There are many places to access your class! Our online classes can be accessed from any computer in the world that is connected to the internet. Contact your instructor immediately upon having computer trouble If you have technical difficulties in the course, there is also a student

helpdesk available to you. The college cannot work directly on student computers due to both liability and resource limitations however they are able to help you get connected to our online services. For help, log into [D2L](#).

### **Instructor Class Policies**

- Questions regarding grades of assignments and exams will be entertained only within a week of receiving the graded assignments and graded exams back from the instructor.
- Labs will start 2 weeks after the lectures start. All lab assignments should be completed during the lab timings unless informed otherwise by the teaching assistant or instructor. In case a student cannot attend the assigned lab section due to a documented absence, the student should discuss this with the teaching assistant and/or the instructor and make up the lab.
- Students are expected to read the chapters to be covered on a particular day prior to coming to class. The instructor will inform the students about what will be covered in a future class and it is the student's responsibility to read before coming to class.
- The "FINAL CALCULATED GRADE" and the "FINAL ADJUSTED GRADE" will remain the same and there will be no rounding up of the final grades.

### **Change of Schedule**

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

### **Refund and Repayment Policy**

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees, and room/board charges that were paid to MSU for the semester. However, if the student received financial aid (federal/state/institutional grants, loans, and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exist in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

### **Services for Students with Disabilities**

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make an application for such assistance through Disability Support Services, located in the Clark Student Center, Room 168, (940) 397-4140. Current documentation of a disability will be required in order

to provide appropriate services, and each request will be individually reviewed. For more details, please go to [Disability Support Services](#).

## **College Policies**

### *Campus Carry Rules/Policies*

Refer to: [Campus Carry Rules and Policies](#)

### *Smoking/Tobacco Policy*

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated smoking areas at each location.

### *Alcohol and Drug Policy*

To comply with the Drug-Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibit the unlawful possession, use, or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state, and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

### *Campus Carry*

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License-to-carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry](#).

### *Active Shooter*

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by the MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit [MSUReady – Active Shooter](#). Students are encouraged to watch the video entitled "Run. Hide. Fight." which may be electronically accessed via the University police department's webpage: ["Run. Hide. Fight."](#)

## **Grade Appeal Process**

Students who wish to appeal a grade should consult the Midwestern State University [MSU Catalog](#)

**\*Notice:** Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.

## Course Schedule:

Week or Module	Activities/Assignments/Exams	Due Date
Week 1	Physics concepts and solved examples based on the chapter/s	N/A
Week 2	Physics concepts and solved examples based on the chapter/s	N/A
Week 3	We will continue doing the physics concepts and solved examples and continue in the following weeks too.	N/A

**NOTE:** Everything will be posted on d2l and/or emailed to everyone in class.

### Assessment for Critical Thinking Skills

The Force Concept Inventory (FCI), developed by I. Halloun, R. R. Hake, E. P. Mosca, and D. Hestenes, is administered to students at the end of the semester. The FCI has been administered nationally since 1995 to assess students understanding of applying Newton's laws in different situations. The exam consists of 30 multiple choice questions. Since the exam must be kept secure, only a few sample questions may be reproduced here. The exam is given at both the beginning and end of the semester to measure students' improvement in understanding over the course of the semester.

### Assessment for Communication Skills

Students are assigned to work on a 5 to 10 minute PowerPoint presentation in groups of about 5 students covering the physics behind a roller coaster of their choice.

Presentation Rubric (specific to this assignment):

Points	5	3	1
Content	Appropriate amount of content to fill the allotted time.	Slightly less or more content than what was needed for the allotted time (under or over by less than a two minutes).	Significantly less or more content than what was needed for the allotted time (under or over by more than two minutes).
Creativity	Uses graphics appropriately and often. May make use of props.	Uses graphics appropriately, but doesn't include any extras (no props).	Little or no graphics.

Points	5	3	1
Style	Speaks to audience. No significant breaks in speech. Conducted in a professional manner.	Loses train of thought but recovers well. Conducted in a less serious manner (too many jokes, not formal enough, etc.) or reads straight from paper.	Rarely or never makes eye contact with audience. May treat entire talk as a joke. Not professional at all.
Physics	All physical concepts are described correctly and the appropriate concepts are addressed.	One or two slight problems in descriptions of physical principals or exclusion of one physical concept that should have been addressed.	Major problems with physical descriptions or leaves out large component of the physical principals involved.
Answering Questions	Able to answer all questions posed without difficulty.	Able to answer all questions posed with little difficulty or makes slight mistake in answering questions posed.	Unable to adequately answer questions posed.

## Assessment for Empirical & Quantitative Skills

The AACU quantitative literacy rubric is applied (copied below).

Criteria	Capstone	Milestone 1	Milestone 2	Benchmark
<p><b>Interpretation</b> Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)</p>	<p>Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.</p>	<p>Provides accurate explanations of information presented in mathematical forms. For instance, accurately explains the trend data shown in a graph.</p>	<p>Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. For instance, accurately explains trend data shown in a graph, but may miscalculate the slope of the trend line.</p>	<p>Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</p>
<p><b>Representation</b> Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</p>	<p>Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.</p>	<p>Competently converts relevant information into an appropriate and desired mathematical portrayal.</p>	<p>Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.</p>	<p>Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.</p>
<p><b>Calculation</b></p>	<p>Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)</p>	<p>Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.</p>	<p>Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.</p>	<p>Calculations are attempted but are both unsuccessful and are not comprehensive.</p>

Criteria	Capstone	Milestone 1	Milestone 2	Benchmark
<b>Application / Analysis</b> Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
<b>Assumptions</b> Ability to make and evaluate important assumptions in estimation, modeling, and data analysis	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.	Attempts to describe assumptions.
<b>Communication</b> Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)

### **Assessment for Teamwork**

Students are assigned to work on a 5 to 10 minute PowerPoint presentation in groups of about 5 students covering the physics behind a roller coaster of their choice.

The AACU teamwork rubric is applied (copied below).

<b>Criteria</b>	<b>Capstone</b>	<b>Milestone 1</b>	<b>Milestone 2</b>	<b>Benchmark</b>
<b>Contributes to Team Meetings</b>	Helps the team move forward by articulating the merits of alternative ideas or proposals.	Offers alternative solutions or courses of action that build on the ideas of others.	Offers new suggestions to advance the work of the group.	Shares ideas but does not advance the work of the group.
<b>Facilitates the Contributions of Team Members</b>	Engages team members in ways that facilitate their contributions to meetings by both constructively building upon or synthesizing the contributions of others as well as noticing when someone is not participating and inviting them to engage.	Engages team members in ways that facilitate their contributions to meetings by constructively building upon or synthesizing the contributions of others.	Engages team members in ways that facilitate their contributions to meetings by restating the views of other team members and/or asking questions for clarification.	Engages team members by taking turns and listening to others without interrupting.
<b>Individual Contributions Outside of Team Meetings</b>	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project. Proactively helps other team members complete their assigned tasks to a similar level of excellence.	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project.	Completes all assigned tasks by deadline; work accomplished advances the project.	Completes all assigned tasks by deadline.

Criteria	Capstone	Milestone 1	Milestone 2	Benchmark
<p><b>Fosters Constructive Team Climate</b></p>	<p>Supports a constructive team climate by doing all of the following:  Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Provides assistance and/or encouragement to team members.</p>	<p>Supports a constructive team climate by doing any three of the following:  Treats team members respectfully by being polite and constructive in communication . Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Provides assistance and/or encouragement to team members.</p>	<p>Supports a constructive team climate by doing any two of the following:  Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Provides assistance and/or encouragement to team members.</p>	<p>Supports a constructive team climate by doing any one of the following:  Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Provides assistance and/or encouragement to team members.</p>

Criteria	Capstone	Milestone 1	Milestone 2	Benchmark
<b>Responds to Conflict</b>	Addresses destructive conflict directly and constructively, helping to manage/resolve it in a way that strengthens overall team cohesiveness and future effectiveness.	Identifies and acknowledges conflict and stays engaged with it.	Redirecting focus toward common ground, toward task at hand (away from conflict).	Passively accepts alternate viewpoints/ideas/opinions.