



PHY 321 Vector Mechanics and Vibration

Poly campus | M, W, F | 9:05-9:55 am | AGBC 115

Course and Faculty Information

Course Description: PHY321 (Vector Mechanics and Vibration) focuses on the vector-based formulation of Newtonian mechanics of particles and rigid bodies, including oscillatory systems. The course will cover mechanics in detail with the use of vector mathematics and calculus, including specifically both linear and rotational kinematics (which focuses on the description of motion) and dynamics (which focuses on the causes of, and changes to, motion), the laws of conservation of momentum and energy, and the concept of oscillation (vibration).

Credits: 3

Prerequisites: None.

Instructor: Pavan Pillalamarri, PhD

Pronouns: he/him/his

Personal Statement: I am fascinated by Physics because I see connections to Physics in everything we do. May it be modelling tumors, analyzing the stock markets, studying the interaction between populations of various cultures. I am originally from Hyderabad, a city in South-central India. I completed my PhD from Oklahoma State University in computational modelling of Inorganic nanowires. It was while pursuing my Doctoral degree that I realized my passion for teaching and chose to be an educator. I then worked as a Physics/Engineering instructor at Central New Mexico community college (Albuquerque) and have been at ASU since 2017. I am a passionate educator and strive to keep my class fun and engaging. I welcome you to meet me at Wanner 340P (Physical location) or at <https://asu.zoom.us/j/9820216314> (virtual). I engage in Physics/applied physics research (including Honors contracts) at the undergraduate level and feel free to meet with me if you are interested.

Inclusive Teaching Philosophy: I will assume that we are all born equals at the same time recognizing that we are all at different stages of our learning process. I will treat everyone with respect, irrespective of your race, gender, sexual orientation, religious beliefs etc., and expect the same from you. I will assume that we are all enthusiastic to learn and will enjoy working with each other. I understand that all our learning environments are not the same and we may be constrained by a variety of factors (childcare, jobs, ill health, disabilities, adjusting to new cultures etc. to name a few). Please do not hesitate to contact me if you need any assistance.

Research has shown that learners are receptive to lectures if they are familiar with the material (at the least: the terminology). In this regard, I will assume that all of us will read the textbook prior to the start of a new chapter. I will also assume that we will develop a growth mindset, where we will reflect on our performances and learn from our mistakes. I will have three hours of my time every week (called: Student hours) allotted to enable one-on-one or small group discussion sessions. I also offer student hours via appointment, so please feel free to email for other available times. I encourage you all to utilize these hours effectively.

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Contact Info:

Physical Office Location: Wanner 340 P (Polytechnic campus)

Virtual office (Via zoom): <https://asu.zoom.us/j/9820216314>

email: pavan.pillalamarri@asu.edu

Student Hours:

M/W/F 11:05 12:00 pm

T/Th: email for appointments (zoom)

College Contact: This course is offered by the [College of Integrative Sciences and Arts](#) (CISA). For more information about the college, visit our website: <https://cisa.asu.edu>. If you have questions about this course, please speak with your instructor. If your instructor is unable to address your questions, please send your inquiry to cisa@asu.edu.

Textbooks, Required Readings and Materials

Textbook - Textbook – *Engineering Statics and Dynamics*, 15th edition

Author – R.C. Hibbeler

Online Homework System – Modified Mastering Physics

The required materials for this course will be integrated into Canvas and made available to you at a special rate.

Your ASU courses can be accessed by both my.asu.edu and asu.instructure.com; bookmark both in the event that one site is down.

Clickers: In-class clicker questions will be asked and students' responses to the questions will be recorded by the iClicker app when been used during lectures. Please install the iClicker Reef app on your mobile device and create an account using your ASURITE@asu.edu email. Students must register using their ASURITE@asu.edu email, for iClicker to connect with Canvas. Other ASU emails will allow them access to the tool but will not integrate with Canvas. Please check this guide to register for an iClicker account.

<https://docs.google.com/document/d/1HANI3rWrPzBOmLmVEptklcl9XZFGAXvSuleYXnc6Lc4/edit>

ASU Sync/Zoom Access

Our course is an in-person course and attendance all of us are expected to attend class in person. ASU Sync/Zoom access will only be provided when dealing with COVID related illness.

Computer Access Requirements

ASU Sync classes can be live streamed anywhere with the proper technology. We encourage you to use a PC or Apple laptop or desktop equipped with a built-in or standalone webcam. You will need an internet connection that can effectively stream live broadcasts. It is recommended that your internet download speed is at least 5.0 mbps. You can use this [tool to test your current connection](#).

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We do not recommend the use of iPads or Chromebooks for ASU Sync because these devices do not work for class exams that may be proctored remotely.

If you are not able to personally finance the equipment that you need to attend class via ASU Sync, ASU has a laptop and WiFi hotspot checkout program available through [ASU Library](#).

Who is eligible?

- Any currently enrolled ASU student is eligible to checkout a laptop or WiFi hotspot. The current availability of laptops can be found [here](#).

Borrowing and returning laptop rules

- Laptops are lent on a first-come, first-serve basis, and cannot be reserved in advance. They can be returned at any time but will be due at the conclusion of the fall 2020 semester.
- Rentals are limited to one laptop per student.
- Laptops are available for checkout at the following libraries on all four campuses: ([Please check online for current library hours](#))
 - Downtown Phoenix campus Library
 - Polytechnic campus Library
 - Tempe: Hayden and Noble Libraries
 - West campus: Fletcher Library
- Return laptops to any ASU Library Information Desk (not at the drop box or other location)
- [Refer to ASU Library Computer Use Policy and ASU Computer, Internet, and Electronic Communications Policy](#).
- Borrowers are responsible for loss, damage, and theft of the laptop while in their possession. Borrowers should verify the condition of the laptop at the time of check-out and upon check-in.

Additional Requirements

This course requires the following technologies:

- Web browsers ([Chrome](#), [Mozilla Firefox](#), or [Safari](#))
- [Adobe Acrobat Reader](#) (free)
- [Adobe Flash Player](#) (free)
- Webcam, microphone, headset/earbuds, and speaker
- Microsoft Office ([Microsoft 365 is free](#) for all currently-enrolled ASU students)
- Reliable broadband internet connection (DSL or cable) to stream videos.

Note: A smartphone, iPad, Chromebook, etc. will not be sufficient for completing your work in an online environment. Although you will be able to access course content with mobile devices, you must use a computer for all assignments, quizzes, and virtual labs completed in Canvas.

Student Success

To be successful:

- check the course daily
- read announcements
- read and respond to course email messages as needed
- complete assignments by the due dates specified
- communicate regularly with your instructor and peers
- create a study and/or assignment schedule to stay on track
- access [ASU Online Student Resources](#) or [CISA Academic Resources](#)

Grading

Attendance/participation (20 % of the course grade)

PHY 321 is an in-person class. Throughout the class session, quizzes/polls will be administered via iclickers. Attendance in every session is expected. There is a 20 % penalty for answering these questions incorrectly. You may, however, consult your classmates and discuss in groups before answering. I do understand that things “happen”, and you may have to miss class, and I will drop two missed sessions. Details will be provided via canvas. **You will need to be present in class to answer these clicker questions. Attempting to answer questions while not present in class will amount to cheating and you will be referred to the Dean of Students for appropriate action.**

Homework (20 % of total course grade)

Homework a traditional problem-solving assignment. You will need to complete all homework in a timely manner. Late work is penalized at the rate of 5% per day. In case you need an extension, I will grant an extra day given that you email your request prior to the due date/time. You may only make such an extension request for one homework assignment. Please remember that this course relies heavily on problem solving, and you need to complete the homework on your own. Use of Solution manuals or copying solutions via other means will only hurt your chances of gaining knowledge. Please refer to the Academic Dishonesty policy listed below in this document. You will have unlimited attempts to answer questions, but each incorrect attempt will result in a 2% deduction (to avoid guess work).

Block Exams (20 % each exam)

Four (4) block exams will be given during the session, each focused on the material of the associated block. The dates of these exams are listed in the course schedule and may be subject to change by the instructor (in which case an announcement will be made). *No late or makeup exam(s) will be given.*

Exam rules and regulations are as follows: Students can bring one **handwritten** sheet of double-sided notes to the exam. Work needs to be shown clearly for full credit. All steps need to be shown clearly.

Breakdown of Points

Our course will have six components: Four block exams, one homework component and the iclickers. I will drop your lowest component score out of the six, which means that each component will be worth 20 % of your course grade.

Follow the appropriate University policies to request an [accommodation for religious practices](#), or to request accommodation for missed assignments [due to University-sanctioned activities](#) or [active military service](#).

Your grade will be determined based on the following grading schema:

Overall Course Grade	ASU Letter Grade	Value
98% ≤ grade	A+	4.33
90% ≤ grade < 98%	A	4.00

87.5% ≤ grade < 90%	A-	3.67
85% ≤ grade < 87.5%	B+	3.33
80% ≤ grade < 85%	B	3.00
77.5% ≤ grade < 80%	B-	2.67
75% ≤ grade < 77.5%	C+	2.33
65% ≤ grade < 75%	C	2.00
50% ≤ grade < 65%	D	1.00
grade < 50%	E	0.00
Incomplete	I	—
Withdrawal	W	—
Audit	X	—
Academic Dishonesty	XE	0.00

Communicating with your Instructor and Classmates

Classroom Community

To build a course climate that is comfortable for all, it is important that students (1) display respect for all members of the class – including the instructor and students; (2) pay attention to and participate in all interactive student partner/instructor sessions and activities; and (3) observe the rules of appropriate online behavior (also known as *netiquette*). This term is defined by the instructor and includes keeping course discussion posts and oral communication with other students (or the instructor) focused on the assigned topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. In addition, they must avoid racist, sexist, homophobic, or other negative language that may unnecessarily exclude course members. This is not an exhaustive list of behaviors; rather, it represents examples of the types of things that can have a dramatic impact on the course environment. Your final grade may be reduced each time you engage in the types of negative behaviors indicated above.

Community Forum

This course uses a Canvas discussion topic called "Community Forum" for general questions and comments about the course. Check the syllabus, announcements, and existing posts to ensure it's not redundant prior to posting a question or comment. You are encouraged to respond to the questions of your classmates.

Email questions of a personal nature to your instructor. You can expect a response within **<# of hours>**.

Chat

The Chat tool in Canvas allows students and teachers to interact in real time. Use Chat only for informal course-related conversations unless your instructor informs you otherwise. Chat is not ideal for questions about assignments; instructors are not required to monitor it and conversations may be buried or lost.

Email

ASU email is an [official means of communication](#) among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

All instructor correspondence will be sent to your ASU email account.

Submitting Assignments

For your own protection, you should keep a copy of everything you hand in, and you should keep your graded assignments at least until grades are finalized at the end of the semester in the event you wish to contest any grades.

All assignments, unless otherwise announced by the instructor, **MUST** be submitted to the designated area of Canvas. Do not submit an assignment via email.

Assignment due dates follow Arizona Standard time. Click the following link to access the [Time Converter](#) to ensure you account for the difference in time zones. Note: Arizona does not observe daylight savings time.

Course Time Commitment

Coursework includes all learning activities including reading, watching videos, studying, and completing assignments. Arizona Board of Regents (ABOR) requires 45 hours of coursework per credit for college-level courses, which translates to:

- 1 credit hour = 45 total hours
- 2 credit hours = 90 total hours
- 3 credit hours = 135 total hours
- 4 credit hours = 180 total hours
- 5 credit hours = 225 total hours

ASU courses range in length from 6 weeks to 15 weeks. Below is a breakdown of the 135-hour required time commitment for a three-credit course divided among weeks for courses of various lengths.

Course Length	Time on Coursework per Week for a 3-credit course	Total Time Requirement for a 3-credit Course
6 weeks	22.5 hours	135 hours
7.5 weeks	18 hours	135 hours
8 weeks	17 hours	135 hours
15 weeks	9 hours	135 hours

Drop and Add Dates/Withdrawals

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If you are unable to take this course for any reason, be aware that there is a limited timeline to [drop or add the course](#). Consult with your advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: [Withdrawal from Classes](#), [Withdrawing as a Financial Aid Recipient](#), [Medical/Compassionate Withdrawal](#), and a [Grade of Incomplete](#).

Grade Appeals

Students must first speak with the instructor of the class to discuss any disputed grades. If, after review, a resolution is not achieved, students may proceed with the appeal process. Student grade appeals must be processed in the regular semester immediately following the issuance of the grade in dispute (by commencement for fall or spring), regardless of whether the student is enrolled at the university. Complete details are available in the [CISA Grade Appeals policy](#).

Academic Integrity

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification, and dismissal. For more information, see provost.asu.edu/academicintegrity.

If you fail to meet the standards of academic integrity in any of the criteria listed on the university policy website, sanctions will be imposed by the instructor, college, and/or dean. Academic dishonesty includes, but is not limited to, cheating on an academic evaluation or assignment, plagiarizing, academic deceit (such as fabricating data or information), or falsifying academic records. Turning in an assignment (all or in part) that you completed for a previous class is considered self-plagiarism and falls under these guidelines. Any infractions of self-plagiarism are subject to the same penalties as copying someone else's work without proper citations. Students who have taken this class previously and would like to use the work from previous assignments should contact the instructor for permission to do so.

If you have any questions about your work and the academic integrity policy, please discuss your assignment or concerns with your instructor, teaching assistant, or your college Academic Integrity Officer in advance of submitting an assignment. Student resources on Sun Devil Integrity and strategies for completing your work with integrity and avoiding plagiarism are available here: [ASU Student Resources for Academic Integrity](#) or provost.asu.edu/academicintegrity for more information.

Harassment Prohibited

ASU policy prohibits harassment on the basis of race, sex, gender identity, age, religion, national origin, disability, sexual orientation, Vietnam era veteran status, and other protected veteran status. Violations of this policy may result in disciplinary action, including termination of employees or expulsion of students. Students are encouraged to report harassment to instructors and the Dean of Students Office.

Student Conduct

ASU and the College of Integrative Sciences and Arts expects and requires its students to act with honesty, integrity, and respect. Required behavior standards are listed in the [Student Code of Conduct and Student Disciplinary Procedures](#), [Computer, Internet, and Electronic Communications policy](#), [ASU Student Academic](#)

[Integrity Policy](#), and outlined by the [Office of Student Rights & Responsibilities](#). Anyone in violation of these policies is subject to sanctions. [Students are entitled to receive instruction free from interference](#) by other members of the class. An instructor may withdraw a student from the course when the student's behavior disrupts the educational process per [Instructor Withdrawal of a Student for Disruptive Classroom Behavior](#). The Office of Student Rights and Responsibilities accepts [incident reports](#) from students, faculty, staff, or other persons who believe that a student or a student organization may have violated the Student Code of Conduct.

Students must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

Title IX

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life Services, <https://goto.asuonline.asu.edu/success/online-resources.html>.

Student Accessibility and Inclusive Learning Services (SAILS)

Qualified students with disabilities who will require disability accommodations in this class are encouraged to make their requests to the instructor at the beginning of the semester either during office hours or by appointment. Note: Prior to receiving disability accommodations, verification of eligibility from the Student Accessibility and Inclusive Learning Services is required. Disability information is confidential.

Student Accessibility and Inclusive Learning Services (eoss.asu.edu/drc)

Email: DRC@asu.edu

SAILS Phone: 480-965-1234

SAILS FAX: 480-965-0441

Tutoring

Free tutoring support is available in person and online for most courses. Services are offered through ASU's University Academic Success Programs for currently enrolled students.

- Tutoring is available in math, business, science, statistics, and engineering courses.
- Writing tutoring is available for any writing project at any stage of the writing process.
- Supplemental Instruction (SI) facilitates collaborative study groups for selected courses.
- Graduate academic tutoring is available for writing and statistics.

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- Academic skills tutoring can help with critical reading, study skills, note taking, and more.
- Resources are available through our YouTube channel, Zoom recordings, and handouts.

Visit <https://tutoring.asu.edu> or call (480) 965-9072 for more information about these services, to view our schedules, or to book an appointment.

Statement on Inclusion

Arizona State University is deeply committed to positioning itself as one of the great new universities by seeking to build excellence, enhance access, and have an impact on our community, state, nation, and the world. To do that requires our faculty and staff to reflect the intellectual, ethnic, and cultural diversity of our nation and world so that our students learn from the broadest perspectives, and we engage in the advancement of knowledge with the most inclusive understanding possible of the issues we are addressing through our scholarly activities. We recognize that race and gender historically have been markers of diversity in institutions of higher education. However, at ASU, we believe that diversity includes additional categories such as socioeconomic background, religion, sexual orientation, gender identity, age, disability, veteran status, nationality, and intellectual perspective.

Mental Health

As a student, like anyone else, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating, and/or lack of motivation. These emotional health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. ASU Counseling Services provides counseling and crisis services for students who are experiencing a mental health concern. Any student may call or walk-in to any ASU counseling center for a same-day or future appointment to discuss any personal concern. Here is the website: eoss.asu.edu/counseling. After office hours and 24/7 ASU's dedicated crisis line is available for crisis consultation by calling 480-921-1006.

Establishing a Safe Environment

Learning takes place best when a safe environment is established in the classroom. In accordance with [SSM 104-02](#) of the Student Services Manual, students enrolled in this course have a responsibility to support an environment that nurtures individual and group differences and encourages engaged, honest discussions. The success of the course rests on your ability to create a safe environment where everyone feels comfortable to share and explore ideas. We must also be willing to take risks and ask critical questions. Doing so will effectively contribute to our own and others' intellectual and personal growth and development. We welcome disagreements in the spirit of critical academic exchange, but please remember to be respectful of others' viewpoints, whether you agree with them or not.

All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the [Office of the Dean of Students](#). If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances.

Prohibition of Commercial Notetaking Services

In accordance with [ACD 304-06 Commercial Note Taking Services](#), written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the note taker's name as well as the instructor's name, the course number, and the date.

Course Evaluation

Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available. The results are always anonymous and cannot be reviewed by the instructor/department until after final grades have been posted.

Trigger Warning

Please note that some course content may be deemed offensive by some students, although it is not my intention to offend anyone. In addition, some materials that we link with online might also be considered offensive, troubling, or difficult to review in terms of language or graphics. I attempt to provide warnings when introducing this kind of material; yet, if I forget to do so, or if something else (in my materials or posts from fellow students) seems offensive, please contact me at pavan.pillalamarri@asu.edu, or the faculty head, [Dr. Douglas Green](#).

Academic Affairs Manual

For a complete guide to Arizona State University course policies, please refer to the [Academic Affairs Manual \(ACD\)](#).

Highly Tentative Schedule (Subject to change)

Dates	Chapter	Topics
Aug. 23-28	Intro and 1, 2	Syllabus, Overview, Review Vectors
Aug. 28 – Sep. 4	2, 3	Review Vectors
Sep. 6 – Sep. 18	12	Kinematics of Particles
Sep. 20– Sep. 27	13	Kinetics of Particles: Newton's 2 nd Law
Sep. 30	1st Exam	(chapters 12, 13)
Oct. 2 – Oct. 16	14	Kinetics of Particles: Work & Energy
Oct. 18 – Oct. 25	15	Momentum
Oct. 28	2nd Exam	(chapters 14, 15)
Oct. 30 - Nov. 8	16	Kinematics of Rigid Bodies
Nov. 13 – Nov. 22	17	Plane Motion of Rigid Bodies: Forces & Accelerations
Nov. 25	3rd Exam	(chapters 16-17)
Nov. 27 – Dec. 2	18	Plane Motion of Rigid Bodies: Energy & Momentum
Dec. 4 - Dec. 6	22	Mechanical Vibrations
Dec. 11, Wednesday	4th Exam	7:30 – 8:30 am (Chapter 18, 22)

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Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. A highly strong possibility exists that we may go slow and need to alter the course schedule to satisfy learning outcomes. Remember that attendance in all classes is mandatory. Please check your ASU email and the course site often for important announcements.