South Plains College
ENGR 2302-601: Dynamics
Spring 2026

Instructor: Taek Hyun Jang, PhD

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Office: M107 (Math and Engineering Building, Levelland)

Office Hours:

• Monday / Wednesday:	Levelland Campus **(M107)**	10:00 AM – 11:300 AM
• Tuesday / Thursday:	Downtown Campus **(B001)**	3:00 PM – 4:00 PM 6:00 PM – 7:00 PM
• Friday	Levelland Campus (**M107**)	10:00 AM – 11:00 AM

- Virtual or Face-to-Face meeting by appointment

Department: Mathematics, Engineering and Computer Science

Discipline: Engineering

Course Number: ENGR 2302

Course Title: Dynamics

Available Formats: Conventional

Campuses: Levelland, Downtown, Plainview, Lubbock Center and Dual Credit

Course Description: Kinematics and kinetics of particles and rigid bodies.

Prerequisite: Successful completion with a grade of 'C' or better in ENGR 2301.

Credit: 3 **Lecture:** 3 **Lab:** 1

Textbook: Engineering Mechanics: Dynamics, Fifteenth Edition, R.C. Hibbeler

This course partially satisfies a Core Curriculum Requirement: None

Core Curriculum Objectives addressed:

- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions

Expected Learning Outcomes:
Upon completion of the course, students will be able to:

1. Define the vector relationships between the positions, velocities, and accelerations for a particle in rectilinear and curvilinear motion,
2. Apply Newton's second law of motion, the principle of work and energy, and the principle of impulse and momentum to the analysis of the motion of a particle and the forces acting on it.
3. Define the vector relationships between the positions, velocities, and accelerations of a system of particles and of a rigid body.
4. Apply Newton's second law of motion, the principle of work and energy, and the principle of impulse and momentum to the analysis of the motion of a system of particles or a rigid body and the forces and moments acting on them.

Course Outline:
In this course we provide an approach to undergraduate classical dynamics. We will follow the textbook closely.

Topics addressed in the course are:

1. Kinematics of a particle: rectilinear and curvilinear motion
2. Rectilinear and curvilinear coordinate systems
3. Rectilinear Coordinates: path and cylindrical
4. Dependent motion and geometric constraint relations
5. Kinetics of a particle: Newton’s second law
6. Kinetics of a particle: Impulse and linear momentum, impact
7. Kinetics of a particle: Work and Energy Principle
8. Angular momentum of a particle
9. Kinetics of a system of particles
10. Planar kinematics of a rigid body
11. Planar Kinetics of a rigid body: Newton’s second law
12. Planar Kinetics of a rigid body: Work and Energy Principle
13. Planar Kinetics of a rigid body: Impulse, linear and angular momentum

Assessment		**Grading Scale**	
Homework	20%	90 – 100	A
Mid Exam (3)	Total 60%	80 – 89	B
Final Exam	20%	70 – 79	C
		60 – 69	D
		Below 60	F

- All assignments will be done through the Pearson mastering engineering online system.
- **Late homework will not be accepted.**
- Mastering Engineering HW grade is calculated such that each problem weighs the same.
- **Only the FE approved calculators can be used for the exams.**

Attendance/Student Engagement Policy: Attendance and engagement are the most critical activities for success in this course. The instructor maintains records of the student's attendance and submission of assignments throughout the semester. The student is expected to attend at least eighty percent (80%) of the **total** class meetings **and** submit at least eighty percent (80%) of the **total** class assignments to have the best chance of success. If the student fails to meet these minimum requirements, the instructor may remove the student from the class with an X, upon their discretion, to help the student from harming their GPA. If the student cannot receive an X, the instructor will assign an F.

Plagiarism violations include, but are not limited to, the following:

1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:

1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain an unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;
8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning**.** Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should

notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To activate accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or email cgilster@southplainscollege.edu for assistance.

Campus Concealed Carry: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked Questions, please refer to the Campus Carry page at: http://www.southplainscollege.edu/campuscarry.php
Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

SPC Bookstore Price Match Guarantee Policy: If you find a lower price on a textbook, the South Plains College bookstore will match that price. The difference will be given to the student on a bookstore gift certificate! The gift certificate can be spent on anything in the store.

If students have already purchased textbooks and then find a better price later, the South Plains College bookstore will price match through the first week of the semester. The student must have a copy of the receipt and the book has to be in stock at the competition at the time of the price match.

The South Plains College bookstore will happily price match BN.com & books on Amazon noted as *ships from and sold by Amazon.com*. Online marketplaces such as *Other Sellers* on Amazon, Amazon's Warehouse Deals, *fulfilled by* Amazon, BN.com Marketplace, and peer-to-

peer pricing are not eligible. They will price match the exact textbook, in the same edition and format, including all accompanying materials, like workbooks and CDs.

A textbook is only eligible for price match if it is in stock on a competitor's website at time of the price match request. Additional membership discounts and offers cannot be applied to the student’s refund.

Price matching is only available on in-store purchases. Digital books, access codes sold via publisher sites, rentals and special orders are not eligible. Only one price match per title per customer is allowed.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

ENGR 2302 – Dynamics Tentative Class Schedule

Week	Date	Topics	Text
1	1/12 – 16	**Syllabus** **Ch12 Kinematics of a Particle** Introduction Rectilinear Kinematics	12.1 – 12.3
2	1/19 – 23	Curvilinear Motions Motion of Projectile	12.4 – 12.8
3	1/26 – 30	Absolute and Relative Motion Analysis	12.9 – 12.10
4	2/02 – 06	**Exam 1 (Ch12): 2/03, Tuesday** **Ch13 Kinetics of a Particle: Force and Acceleration** Force and Acceleration	13.1 – 13.4
2/035	2/09 – 13	Equation of Motion	13.5 – 13.6
6	2/16 – 20	**Ch14 Kinetics of a Particle: Work and Energy** Work and Energy Conservative forces & conservation of energy	14.1 – 14.6
7	2/23 – 27	**Ch15 Kinetics of a Particle: Impulse and Momentum** Impulse and Momentum	15.1 – 15.4
8	3/02 – 06	Angular Impulse and Momentum Conservation of Angular Momentum	15.5 – 15.7
9	3/09 – 13	**Exam 2 (Ch 13, 14 and 15): 3/10, Tuesday** **Ch16 Planar Kinematics of a Rigid Body** Planar Kinematics of Rigid Body	16.1 – 16.4
10	3/16 – 20	Spring Break – All campuses closed	
11	3/23 – 27	Relative Motion Analysis	16.5 – 16.8
12	3/30 – 4/03	**Ch17 Planar Kinetics of a Rigid Body: Force and Acceleration** Moment of Inertia Rigid Body Equation of Motion	17.1 – 17.3
13	4/06 – 10	Rigid body equations of motion: rotation	17.4 – 17.5
14	4/13 – 17	**Exam 3 (Ch 16 and 17): 4/14, Tuesday** **Ch18 Planar Kinetics of a Rigid Body: Work and Energy** Rigid Body Work and Energy Rigid Body Conservation of Energy	18.1 – 18.5
15	4/20 – 24	**Ch19 Planar Kinetics of a Rigid Body: Impulse and Momentum** Rigid boy impulse and momentum	19.1 – 19.2
16	4/27 – 5/01	Rigid body conservation momentum	19.3
17	5/04 – 07	**Final Exam (Comprehensive): 5/07, Thursday (1:00 PM – 3:00 PM)**	