

**South Plains College**  
**Common Course Syllabus: ENGR 2302**  
**Revised December 2019**

**Department:** Mathematics, Engineering, and Computer Science

**Discipline:** Engineering

**Course Number:** ENGR 2302

**Course Title:** Engineering Mechanics - Dynamics

**Available Formats:** conventional

**Campuses:** Reese Center

**Course Description:** Basic theory of engineering mechanics, using calculus, involving the motion of particles, rigid bodies, and systems of particles; Newton's Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.

**Prerequisite:** Successful completion of 'C' or better in ENGR 2301

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

**Textbook:**

**Supplies:** Please see the instructor's course information sheet for specific supplies.

**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

**Student Learning Outcomes:** Upon completion of this course and receiving a passing grade, the student will be able to:

1. Express dynamic quantities as vectors in terms of Cartesian components, polar coordinates, and normal-tangential coordinates.
2. Compute mass moments of inertia for systems of particles and rigid bodies.
3. Solve kinematic problems involving rectilinear and curvilinear motion of particles.
4. Solve kinetic problems involving a system of particles using Newton's Second Law.
5. Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving particles and systems of particles.
6. Solve kinematic problems involving the translation and rotation of a rigid body.
7. Solve kinetic problems involving planar translation and rotation of rigid bodies.
8. Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving rigid bodies in planar motion.

**Student Learning Outcomes Assessment:** A pre- and post-test questions will be used to determine the extent of improvement that the students have gained during the semester

**Course Evaluation:** There will be departmental final exam questions given by all instructors.

**Attendance Policy:** Attendance and effort are the most important activities for success in this course. Records of your attendance are maintained throughout the semester. Five (5) absences, **for any reason**, are allotted to the student for the semester. Tardies count as one-half (1/2) of an absence. Tardies will be applied for consistently being late to class, as deemed by the instructor and leaving class early. If this number is exceeded, the instructor has the right to drop you with a grade of F or an X, depending on their discretion.

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](mailto: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.



**Engineering 2302 – Engineering Mechanics: Dynamics**  
**Section 201: Tuesday/Thursday 2:30 PM – 4:15 PM**  
**Room: Building 2, 229, Reese Campus**

**Instructor:** Mr. Evan Vargas

**Email:** [evargas@southplainscollege.edu](mailto:evargas@southplainscollege.edu)

**Office:** Math Building, M101, Levelland Campus

**Phone:** (806) 716-4673

**Office Hours**

**M-R:** 10:40 AM – 10:55 AM [TA209A]

**M/W:** 11:00 AM – 11:30 AM [M101]

**M:** 2:45 PM – 5:20 PM [Reese: 229]

**W:** 2:45 PM – 3:00 PM [Reese: 229]

**F:** 9:00 AM – 12:00 PM [M101]

**Course Information**

**Textbook** *Vector Mechanics for Engineers: Statics and Dynamics* by Ferdinand Beer and E. Johnston and David Mazurek and Phillip Cornwell and Brian Self  
**ISBN: 9781259638091**

**McGraw Hill Connect** McGraw Hill Connect Code from the Bookstore OR purchase online - **Required**

**Materials** Pencils, erasers, paper, and graphing calculator.

**Grading Policy**

<b>Grading Scale:</b>	90-100	<b>A</b>	<b>Weights:</b>	Homework	10%
	80-89	<b>B</b>		Quiz	10%
	70-79	<b>C</b>		Exams (4)	15% each
	60-69	<b>D</b>		Final Exam	20%
	0-59	<b>F</b>		<b>Total</b>	<b>100%</b>

**Online Homework** Homework is assigned online through McGraw Hill Connect. The homework enables students to receive feedback immediately as progress is made through each assignment.

- Physical homework is not required to turn in.
- Homework cannot be made up after the due date.

**Quiz** Quizzes are assigned in class and contain material pertaining to Homework Assignments and Lectures.

- Quizzes are timed 30 minutes.
- Make-up quizzes will not be given under any circumstances.

**Exams** Exams are scheduled in-class. Each exam will cover material from Homework, Quizzes, and Lectures.

- You will have the entire class period to complete each Exam.
- Exams will contain a combination of open answer, fill in the blank, and True/False.
- Refer to the Calendar for each Exam date.
- The Final Exam is comprehensive. **Tuesday, May 10<sup>th</sup>, 1:00 PM – 3:00 AM**
  - Failure to attempt the Final Exam will result in a failing grade for the course.
  - The Final Exam will replace one (1) missed Exam or your lowest scored Exam.

## **Class Policies**

### **Attendance 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 submit at least eighty percent (80%) of the class assignments to have the best chance of success. If the student fails to meet these minimum requirements, the instructor can remove the student from the class with an X or F upon their discretion.

### **McGraw Hill – Connect**

Students are expected to purchase McGraw Hill's Connect either from the Levelland/Reese bookstore OR online on the Pearson website. It is a **required** course material item, without obtaining access to the online software the student will be dropped from the course.

### **Additional Support**

Supplemental material for this class is available in online instructional videos and an open educational resource (OER) textbook.

- Online instructional videos are provided to the student via Blackboard located in each week's folder.
- A free, online textbook, is available for online viewing or digital download.

SPC also offers **free tutoring**. This information is located [here](#).

### **Office Hours**

Office hours will be held at the listed times or virtually. Virtual office hours will be held using Zoom. Please make an appointment [here](#) to ensure time availability.

### **South Plains College Email Policy**

The instructor will only acknowledge, respond, and send emails to the student assigned South Plains College email. This ensures the intended recipient receives all correspondence from the instructor. It is the students' responsibility to have their email set up and ready to use by the end of the first week of class.

### **Drop/Withdrawal**

Students should submit a Student Initiated Drop Form online to drop from the course. An instructor signature is not required. If the student wishes to withdraw from this or more courses, the student needs to contact the Advising Office.

### **COVID Syllabus Statement**

Consistent with the latest CDC recommendations, we have revised our guidance for students, faculty, and staff who have a known exposure or have tested positive. Anyone with a known exposure should wear a mask for 10 days and should seek a COVID-19 test on day five after exposure. If you test positive or develop symptoms, you should immediately self-isolate and seek a COVID-19 test. Please immediately notify your instructor, supervisor, and DeEtte Edens, Associate Director of Health and Wellness, any time you test positive for COVID-19. Anyone who tests positive is required to self-isolate for five days. Following the five-day isolation period, if you are asymptomatic or your symptoms are resolving, you may return to work or class but should wear a mask for five additional days. If you are still symptomatic, please contact DeEtte Edens at [dedens@southplainscollege.edu](mailto:dedens@southplainscollege.edu) or 806-716-2376 prior to your return date.

## Course Itinerary

<b>Week 1</b>	Jan. 18 Jan. 20	<b>Kinematics of Particles</b> Rectilinear Motion of Particles; Relative Motion Curvilinear Motion of Particles; Non-Rectangular Components
<b>Week 2</b>	Jan. 25 Jan. 27	<b>Quiz #1 – Kinematics of Particles</b> <b>Kinetics of Particles: Newton's Second Law</b> Newton's Second Law and Linear Momentum; Angular Momentum and Orbital Motion
<b>Week 3</b>	Feb. 1 Feb. 3	<b>Quiz #1 – Newton's Second Law</b> <b>Exam #1 Review</b>
<b>Week 4</b>	Feb. 8 Feb. 10	<b>Feb. 8<sup>th</sup> – Examination #1</b> <b>Kinetics of Particles: Energy and Momentum Methods</b> Work and Energy; Conservation of Energy
<b>Week 5</b>	Feb. 15 Feb. 17	Impulse and Momentum; Impacts <b>Quiz #3 – Energy and Momentum Methods</b>
<b>Week 6</b>	Feb. 22 Feb. 24	<b>Systems of Particles</b> Newton's 2 <sup>nd</sup> Law on System of Particles; Energy and Momentum on System of Particles Variable Systems of Particles
<b>Week 7</b>	Mar. 1 Mar. 3	<b>Quiz #4 – Systems of Particles</b> <b>Exam #2 Review</b> <b>Mar. 3<sup>rd</sup> – Examination #2</b>
<b>Week 8</b>	Mar. 8 Mar. 10	<b>Kinematics of Rigid Bodies</b> Translation and Fixed Axis Rotation; General Plane Motion – Velocity Instantaneous Center of Rotation; General Plane Motion: Acceleration
Mar. 14 – Mar. 18		<b>Spring Break</b>
<b>Week 9</b>	Mar. 22 Mar. 24	Motion with Respect to a Rotating Frame <b>Quiz #5 – Kinematics of Rigid Bodies</b> <b>Plane Motion of Rigid Bodies: Forces and Accelerations</b> Kinetics of a Rigid Body; Constrained Plane Motion
<b>Week 10</b>	Mar. 29 Mar. 31	<b>Quiz #6 – Plane Motion: Forces and Accelerations</b> <b>Exam #3 Review</b>
<b>Week 11</b>	Apr. 5 Apr. 7	<b>Apr. 5<sup>th</sup> – Examination #3</b> <b>Plane Motion of Rigid Bodies: Energy and Momentum Methods</b> Energy Methods for a Rigid Body; Momentum Methods for a Rigid Body
<b>Week 12</b>	Apr. 12 Apr. 14	Eccentric Impact <b>Quiz #7 – Plane Motion: Energy and Momentum Methods</b>
<b>Week 13</b>	Apr. 19 Apr. 21	<b>Mechanical Vibrations</b> Vibrations without Damping; Free Vibrations of Rigid Bodies Applying Principle of Conservation of Energy
<b>Week 14</b>	Apr. 26 Apr. 28	<b>Exam #4 Review</b> <b>Apr. 28 – Examination #4</b>
<b>Week 15</b>	May 3 May 5	Damped Free and Forced Vibrations <b>Final Examination Review</b>
<b>Week 16</b>	<b>May 10</b>	<b>Final Exam 1:00 PM – 3:00 PM</b>