

ENGR 3122:

ENGINEERING MECHANICS - DYNAMICS

Instructor

Dr. Muhammad Salman, Assistant Professor

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Office Location: G-122

Office Hours: Monday & Wed: 2:00 PM – 4:30 PM

(Additional hours available by appointment)

Course Description

A study of the mechanics of particles and rigid bodies. Topics covered include: kinematics and kinetics of particles; work and kinetic energy; impulse and momentum; rigid body motions; relative motion; and moving coordinate systems.

Credit Hours: 3

Class Time: 11:00 am – 1:45 pm in Q-216

Prerequisite(s): ENGR 2214: Statics

MATH 2254: Calculus II

Course Objectives

By the end of this course, you should be able to:

1. Work particle kinematics and kinetics problems in Cartesian, normal-tangential, and cylindrical coordinates, applying calculus,
2. Analyze dependent motion of particles,
3. Apply the principle of work and energy to particles,
4. Apply the principle of conservation of momentum, and of impulse and momentum to particles,
5. Work kinematics problems of rigid bodies in planar motion, and use instantaneous centers of zero velocity to solve velocity problems,
6. Solve problems involving impact of particles, and
7. Find centroids and mass moments of inertia of rigid bodies using calculus, and apply to problems involving planar kinetics of rigid bodies.



Required Textbook/Supporting Materials

Required Text: *Engineering Mechanics: Dynamics*, 14th Edition (2015), Hibbeler
ISBN-13: 978-0133915389
ISBN-10: 0133915387

Essentials: Scientific Calculator, Engineering Paper

Course Topics

1. Kinematics of a Particle: Force and Acceleration; Work and Energy; Impulse and Momentum
2. Planar Kinematics of a Rigid Body: Force and Acceleration

Important Dates

Last Day to Withdraw: Monday, June 22nd

Holiday: Tuesday, July 4th

Last Day of Classes: Wed, July 18th

Final Exam: Tuesday, July 24th (11:30 AM – 1:30 PM)

All Grades Posted: Saturday, July 28th

Course Expectations

Course Delivery Method

This course will use a variety of instructional strategies and techniques including, but not limited to, face-to-face lectures, demonstrations, problem solving sessions, and small group discussions.

Communication Rules

The best way to reach the instructor between class periods is using campus email. This way the instructor will know what class you are in already. The instructor will reply as quickly as possible to questions sent over e-mail. If you wish to meet with in person, you can drop by during office hours.

The instructor is committed to answering all emails within 1 business day from the time you first transmit the email, unless he/she lets you know in advance of travel prohibiting him/her from doing so (or if there is an emergency). At times the instructor will send a mass email to the class or an announcement. This will be through D2L email and with the campus email. The instructor does not know your Yahoo or Gmail accounts so do not expect any mass emails to those accounts. **CHECK YOUR D2L EMAIL ACCOUNTS FREQUENTLY!**

Late Assignments & Make-up Assessments

Assignments are due at the BEGINNING of class on the due date. Late assignments will not be accepted except in the case of a valid excuse. Make-up assessments will not be allowed except in the case of an excused absence. Valid excuses include illness, death in the family, or participation in a sponsored KSU event. All excuses require appropriate documentation.

Emergency Policies

In the event of an emergency that forces the college to close for an extended period, students must contact the instructor of this class within 48 hours using the contact information (e.g., email address, or Desire2Learn) on the syllabus to obtain directions for continuing the course. The instructor will provide directions for the transmission and submission of course assignments and course assessments, including due dates.

If the instructor for the course cannot be reached within the specified period of time (within 2 business days), the chair of the department responsible for the course can be reached at the email address posted on the university's website.

Grading

| | |
|---------------|-------------|
| Exams (3) | 45% |
| Quizzes (4) | 20% |
| Homework + CP | 15% |
| Final Exam | 20% |
| Total | 100% |

Grade Conversion: A: (90-100), B: (80-89), C: (70-79), D: (60-69), F: (0-59)

Problems related to grading should be first brought to the attention of the professor for the course. However, a resolution of unsettled problems or concerns may be pursued by following the procedures outlined in the Kennesaw State University Catalog.

Course Outline

Below is an outline of the content and activities in each unit of the course.

| Weeks | Content/Activity |
|--------------|-------------------------|
| 1 | Chapter 12 |
| 1 | Chapter 12/Quiz 1 |
| 2 | Chapter 12 |
| 2 | Chapter 13/Exam 1 |
| 3 | Chapters 13 & 14 |
| 3 | Chapter 14/Quiz 2 |
| 4 | Chapters 14 & 15 |
| 4 | Chapter 15/Exam 2 |
| 5 | Chapter 15 |
| 5 | Chapter 15/Quiz 3 |
| 6 | Chapter 16 |
| 6 | Chapter 16/Exam 3 |
| 7 | Chapter 16 |
| 7 | Chapter 16/Quiz 4 |
| 8 | Chapter 17 |
| 8 | Chapter 17 |
| | Final Exam |

This schedule may be modified.

University Policies

Academic Honesty

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/ falsification of University records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.

Plagiarism Policy

No student shall receive, attempt to receive, knowingly give or attempt to give unauthorized assistance in the preparation of any work required to be submitted for credit as part of a course (including examinations, laboratory reports, essays, themes, term papers, etc.). When direct quotations are used, they should be indicated, and when the ideas, theories, data, figures, graphs, programs, electronic based information or illustrations of someone other than the student are incorporated into a paper or used in a project, they should be duly acknowledged.

Web Accessibility

Kennesaw State University follows the guidelines of the Universal Design for Learning standard of web accessibility. Faculty use Word, PDF, and HTML formats when communicating electronic information to students whenever possible and appropriate in light of the goals of the course. Faculty are trained to use Web Accessibility Evaluation tools, e.g., WAVE (www.wave.webaim.org), and make adjustments as possible and appropriate in light of the goals of the course. For free resources available to students on web accessibility, please visit the Web Accessibility Resources page at the Distance Learning Center: <http://www.kennesaw.edu/dlc/facultyresources/index.php#>

Disability Statement

Kennesaw State University provides program accessibility and reasonable accommodations for persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Kennesaw State University does not deny admission or subject to discrimination in admission any qualified disabled student.

A number of services are available to help students with disabilities with their academic work. In order to make arrangements for special services, students must visit the Office for Student Disability Services and make an appointment to arrange an individual assistance plan. In most cases, certification of disability is required.

Special services are based on

- medical and/or psychological certification of disability,
- eligibility for services by outside agencies, and
- ability to complete tasks required in courses.

ADA Position Statement

Kennesaw State University, a member of the University System of Georgia, does not discriminate on the basis of race, color, religion, age, sex, national origin or disability in employment or provision of services. Kennesaw State University does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its programs or activities.

The Americans with Disabilities Act (ADA), Public Law 101-336, gives civil rights protections to individuals with disabilities. This statute guarantees equal opportunity for this protected group in the areas of public accommodations, employment, transportation, state and local government services and telecommunications.

The following individuals have been designated by the President of the University to provide assistance and ensure compliance with the ADA. Should you require assistance or have further questions about the ADA, please contact:

- ADA Compliance Officer for Students
470-578-6443
- ADA Compliance Officer for Facilities
470-578-6224
- ADA Compliance Officer for Employees
470-578-6030

For more information, go to: http://www.kennesaw.edu/stu_dev/dsss.

KSU Sexual Misconduct Policy

Kennesaw State University adheres to KSU's policy prohibiting sexual misconduct both in and out of the classroom. Questions about this policy should be directed to the KSU Equal Employment Opportunity (EEO) and Title IX officer by telephone at (470) 578-2614. You may also visit the University's EEO website <http://www.kennesaw.edu/eoo/index.html> for more information.

Copyright Law

Kennesaw State University adheres to USG's policy to respect the right of copyright. Holders and comply with copyright laws as set forth in the United States Copyright act. For more information, see the following link to USG's policy: <http://www.usg.edu/copyright/>

Student Records/FERPA

Kennesaw State University adheres to the Family Educational Rights & Privacy Act of 1974 – FERPA. See the following link for more information: http://www.usg.edu/information_technology_handbook/section9/tech/9.5_privacy_and_security

Electronic Recording and Social Media

Electronic recording performed without the consent of the people being recorded chills the free exchange of ideas. Academic freedom, free inquiry, and freedom of expression should not be limited by the fear that one's brainstorming, polemic discourse, speculative inquiry, or any other kind of expressed curiosity made within the space of a university classroom will be made public without one's consent. This fear is unacceptable regardless of whether one is in an online, hybrid, or face-to-face classroom setting. Accordingly, no person shall make public any electronically recorded class discussion without the written permission of the instructor. This policy is not intended to discourage electronic recording in the classroom or the use of social media when such actions are performed with the written consent of the instructor, and others as appropriate. Note: Faculty accommodate all reasonable requests to electronically record a class discussion; these requests must be documented by the DisAbled Student Support Services available at: http://www.kennesaw.edu/stu_dev/dsss/prospect.shtml

Disruption of Campus Life Statement

It is the purpose of the institution to provide a campus environment, which encourages academic accomplishment, personal growth, and a spirit of understanding and cooperation. An important part of maintaining such an environment is the commitment to protect the health and safety of every member of the campus community. Belligerent, abusive, profane, threatening and/or inappropriate behavior on the part of students is a violation of the Kennesaw State University Student Conduct Regulations. Students who are found guilty of such misconduct may be subject to immediate dismissal from the institution. In addition, these violations of state law may also be subject to criminal action beyond the university disciplinary process.

Student Rights and Responsibilities

Students of Kennesaw State University are entitled to an environment that is conducive to learning and individual growth. To this end, students enrolling at Kennesaw State University assume a responsibility to abide by the policies and regulations expressed in this section. By doing so, students may fulfill their responsibilities and enjoy the exercise of their own rights while also respecting the rights of others.

All rights and responsibilities may be found in the University Catalog at catalog.kennesaw.edu.