



**Class Reference Number (CRN):** 15846

**Instructor:** Methaq S. Abed, Ph.D., P.E.

**Office:** Engineering Annex, A104.

**Office Hours:** Virtually via Blackboard Collaborate Ultra, Wednesday from 10:30 to 12:00 pm., and Thursday from 3:00 to 4:30 pm. Another time by appointment. You are welcome to send your questions via email and allow 48 hours to respond.

**Email:** [msabed@utep.edu](mailto:msabed@utep.edu)

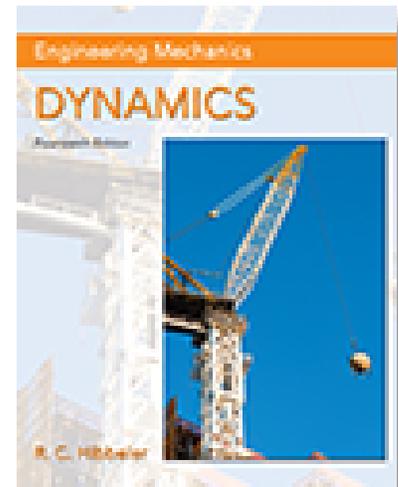
**Class Meeting Schedule:** 10:30 -11:50 pm T (F2F or Online)  
10:30 -11:50 pm R (Online)

**Class Location:** Undergraduate Learning Center (UGLC), 126.

**Class Duration:** Aug.24<sup>th</sup>, 2020 - Dec.3<sup>rd</sup>, 2020

**Prerequisites:** Mechanics of Materials.

**Text Book:** Mechanics Dynamics by R. C. Hibbeler, 14<sup>th</sup> edition.



## COURSE DESCRIPTION

This three-credit-hour class is intended to provide the students with an introduction to the theories of kinematics and kinetics for a particle and system of particles, perform dynamics analysis for rigid bodies under planar motion. This course satisfies the fundamental dynamics components of the general engineering program—no software required for this class.

## COURSE OBJECTIVES

At the end of this class, the typical students should be well prepared in the following areas:

- Determine the kinematic quantities (position, displacement, velocity, and acceleration) of a particle traveling along straight and curved paths.
- Apply the equation of motion using the rectangular coordinates, or the normal and tangential coordinates.
- Apply the principle of work and energy to a particle or system of particles.
- Calculate the linear momentum of a particle and the linear impulse of a force.
- Determine the mass moment of inertia of a rigid body or a system of rigid bodies.
- Apply the three equations of motion for a rigid body in planar motion.
- Analyze the planar kinetics of a rigid body undergoing rotational motion.
- Analyze the planar kinetics of a rigid body undergoing general plane motion.
- Define the various ways a force and couple do work.
- Apply the principle of work and energy to a rigid body.
- Determine the potential energy of conservative forces.

**TOPICS**

- |  |              |
|--|--------------|
| 1. Kinematics of a Particle                                  | (Chapter 12) |
| 2. Kinematics of a Particle: Force and Acceleration          | (Chapter 13) |
| 3. Kinematics of a Particle: Work and Energy                 | (Chapter 14) |
| 4. Kinematics of a Particle: Impulse and Momentum            | (Chapter 15) |
| 5. Planar Kinematics of a Rigid Body                         | (Chapter 16) |
| 6. Planar Kinematics of a Rigid Body: Force and Acceleration | (Chapter 17) |
| 7. Planar Kinematics of a Rigid Body: Work and Energy        | (Chapter 18) |

This course satisfies the fundamental dynamics components of the general engineering program.

**GRADING PLAN**

The final grade for the course will be calculated based on the breakdown given below:

- Exams 60%
- Homework through mastering engineering 20%
- Quizzes through mastering engineering 10 %
- Participation through reading quiz/discussion boards 10%

There will be four exams. *If you miss two exams, the instructor has the right to drop you or assign you an "F" grade for the class. The exams' grade will be calculated based on the average of the three highest tests 'grade. It means that the lowest test grade will be dropped. If a student misses one test for technology issues, that would be his/her lowest test to be dropped.*

**Homework:** All students are required to register for the course through mastering engineering during the first week of class. If a student fails to register to mastering engineering after one week of starting the class, the instructor has the right to drop him from class. Homework assignments will be due on Sundays at 11:59 pm. Late homework will be penalized by a 50% deduction per day after the deadline. You have six trials to submit the correct answer.

**Register to the course with My Lab's and Mastering through Blackboard.**

Simply, you can register to the course by accessing week -1 → H.W.#1.



If you have any technical issues with registering or submitting your answers, please check with the mastering engineering technical support, you can find it in the link below:

<https://www.pearsonmylabandmastering.com/northamerica/masteringengineering/students/support/index.html>

**Quizzes:** All quizzes will be given through mastering engineering; the duration of the quiz would be 30 minutes. Usually, the quiz will be available for 12 hours, and the student can take it at his/her convenience. No makeup quizzes will be given under any circumstances. If you miss only one quiz, the next quiz will be doubled.

## GRADING SCALE

Your final grade will be calculated based on the points you have accumulated as follows:

- A       $\geq 88$
- B       $\geq 78$  but  $< 88$
- C       $\geq 68$  but  $< 78$
- D       $\geq 58$  but  $< 68$
- F       $< 58$

## TECHNOLOGY REQUIREMENTS

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop, a scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions.

**IMPORTANT:** If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!



## Course Communication: How we will stay in contact with each other

Because this is an online class, we won't see each other in the ways you may be accustomed to: during class time, small group meetings, and office hours. However, there are several ways we can keep the communication channels open:

- **Office Hours:** We will not be able to meet on campus, but I will still have office hours for your questions and comments about the course. My office hours will be held on Blackboard Collaborate and during the following times:

Wednesday: 10:30 –12 pm Mountain Time

Thursday: 3:00–4:30 pm Mountain Time

- **Email:** UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24-48 hours of receipt. When e-mailing me, be sure to email from your UTEP student account, and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your university identification number.
- **Discussion Board:** If you have a question that you believe other students may also have, please post it in the Help Board of the discussion boards inside of Blackboard. Please respond to other students' questions if you have a helpful response.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

## NETIQUETTE

As we know, sometimes, communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean, given the lack of body language and immediate feedback. Therefore, please keep this netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider the audience. This is a college-level course; therefore, all communication should reflect polite consideration of other's ideas.
- Respect and courtesy must be provided to classmates and the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professors only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.



## **Course Policies: What do you need to do to be successful in the course**

### **ATTENDANCE AND PARTICIPATION**

Attendance in the course is determined by participation in the learning activities of the course. Your participation in the course is important not only for your learning and success but also to create a community of learners. Participation is determined by completion of the following activities:

- Reading/Viewing all course materials to ensure understanding of assignment requirements
- Participating in an engaging discussion with your peers on the discussion boards (grading rubric provided in the “grading information” area of each forum)
- Participating in scheduled Blackboard Collaborate sessions
- Other activities as indicated in the weekly modules

Because these activities are designed to contribute to your learning each week, they cannot be made up after their due date has passed.

### **EXCUSED ABSENCES AND/OR COURSE DROP POLICY**

According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” See academic regulations in the UTEP Undergraduate Catalog for a list of excused absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the [Registrar's Office](#) to initiate the drop process. If you do not, you are at risk of receiving an “F” for the course.

### **DEADLINES, LATE WORK, AND ABSENCE POLICY**

#### Quiz and Discussion Assignments

- All quizzes, and discussion board assignments will be due on Sundays at midnight (11:59 pm). No late work will be accepted if the reason is not considered excusable.

### **MAKE-UP WORK**

Makeup work will be given *only* in the case of a *documented* emergency. Note that makeup work may be in a different format than the original work, may require more intensive



preparation, and maybe graded with penalty points. If you miss an assignment and the reason is not considered excusable, you will receive a zero. It is therefore important to reach out to me—in advance if at all possible—and explain with proper documentation why you missed a given course requirement. Once a deadline has been established for makeup work, no further extensions or exceptions will be granted.

## **ALTERNATIVE MEANS OF SUBMITTING WORK IN CASE OF TECHNICAL ISSUES**

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work (answers to discussion points, quizzes, exams, and essays) in a separate Word document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email me your back-up document as a last resort.

## **INCOMPLETE GRADE POLICY**

Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

## **ACCOMMODATIONS POLICY**

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#) (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at [cass@utep.edu](mailto:cass@utep.edu), or apply for accommodations online via the [CASS portal](#).



### COVID-19 Accommodations

Students are not permitted on campus when they have a positive COVID-19 test, exposure, or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations.

*(classes with on-campus meetings)* Students who are considered high risk according to CDC guidelines and/or those who live with individuals who are considered high risk may contact [Center for Accommodations and Support Services](#) (CASS) to discuss temporary accommodations for on-campus courses and activities.

### SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

### CLASS RECORDINGS

The use of recordings will enable you to have access to class lectures, group discussions, and so on in the event you miss a synchronous or in-person class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action.

### PLAGIARISM DETECTING SOFTWARE

Some of your course work and assessments may submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.



### **COPYRIGHT STATEMENT FOR COURSE MATERIALS**

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

### **COVID-19 PRECAUTIONS**

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at [screening.utep.edu](https://screening.utep.edu). If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to [COVIDaction@utep.edu](mailto:COVIDaction@utep.edu).

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website ([screening.utep.edu](https://screening.utep.edu)) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face-covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

**(classes with on-campus meetings)** Please note that if COVID-19 conditions deteriorate in the City of El Paso, all course and lab activities may be transitioned to remote delivery.

### **Course Resources: Where you can go for assistance**

UTEP provides a variety of student services and support:

#### Technology Resources

- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in-person if on campus.



#### Academic Resources

- [UTEP Library](#): Access a wide range of resources, including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor, and explore other history resources.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

#### Individual Resources

- [Military Student Success Center](#): Assists personnel in any branch of service to reach their educational goals.
- [Center for Accommodations and Support Services](#): Assists students with ADA-related accommodations for coursework, housing, and internships.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

#### **ACES & Tutoring Center**

Please note there are tutoring services available in the ACES center. Tutoring is free to you; the Department pays them. If tutors are not used, the Department may stop funding them. Check the schedule of the tutors and make use of the services. For more details, visit the

**ME Advising Blackboard -> cc mech acadav: MECH Academic Advising -> Tutoring & Resources**

At the link, you can find tutor schedules, location of the ACES center, and the list of tutors available. For more information, send email to [METutors@utep.edu](mailto:METutors@utep.edu)



## COURSE MODULES

Weeks	OBJECTIVES	ACTIVITIES	ASSESSMENTS	NOTES
<b>Week -1</b> 8/24-8/30	-Syllabus & course overview  -Rectilinear Motion	<b>-Discussion Board</b> Introduction: Introduce yourself with a small bio with a small photo recommended.  <b>-Read:</b> Chapter 12, Sec.'s (1,&2). OR  Lecture 1 (power point slides on BB).  <b>-Watch videos for week 1</b>	-Syllabus Quiz due on Sunday at 11:59 pm.  -Discussion board due on Sunday at 11:59 pm.	-Blackboard Collaborate Ultra meeting, <b>[First Day Meeting]</b> from 10:30 to 11:50 am. , Tuesday, Aug.25 <sup>th</sup>
<b>Week -2</b> 8/31-9/6	- Rectilinear Motion [Erratic Motion]	<b>-Read:</b> Chapter 12, Sec. (3). OR  Lecture 2 (power point slides on BB).  <b>-Watch videos for week 2</b>	-H.W.#1 due on Sunday, Sept.6 <sup>th</sup> at 11:59 pm  -Quiz #1 on Thursday, for 30 min.	-F2F class on <a href="#">Tuesday, Group Solving Problems and Discussion.</a>  -H.W.#1 and Quiz#1 through mastering engineering.
<b>Week -3</b> 9/7-9/13	-Curvilinear Motion ((Normal and Tangential Components)  -Motion of Projectile	- <b>Read:</b> Chapter -12- Sec.'s (4-5, &6). OR  Lectures 3&4 (power point slides on BB).  <b>-Watch videos for week 3</b>	-Quiz #2 on Thursday, for 30 min.  Reading Quiz, due on Sunday at 11:59 pm	Quiz#2 through mastering engineering
<b>Week -4</b> 9/14-9/20	-Motion of Projectile  - Absolute Dependent Motion Analysis of Two Particles	- <b>Read:</b> Chapter-12, Sec.'s (6 &9). OR  Lectures 4&5 (power point slides on BB)  <b>-Watch videos for week 4</b>	-H.W.# 2 due on Sunday, Sept.20 <sup>th</sup> at 11:59 pm  - Reading Quiz, for participation due on Sunday at 11:59 pm.	-F2F class on <a href="#">Tuesday, Group Solving Problems and Discussion.</a>



<p><b>Week -5</b> 9/21-9/27</p>	<p>-Relative Motion Analysis of Two Particles Using Translating Axes  -Equations of Motion for Normal and Tangential Coordinates</p>	<p>- <b>Read:</b> Chapter-12- (Sec.'s 10&amp;7). OR  -Lectures 6 &amp;7(power point slides on BB)  - <b>Watch</b> videos for week 5</p>	<p><b>-Exam #1 on Tuesday, Sep.22<sup>nd</sup> from 10:30 to 11:50 am in class.</b>  -Reading Quiz, due on Sunday at 11:59 pm.</p>	<p>-F2F class</p>
<p><b>Week -6</b> 9/28-10/4</p>	<p>- Equations of Motion for Normal and Tangential Coordinates  -Equations of Motion</p>	<p>- <b>Read:</b> Chapter-12, Sec.7, Chapter-13, Sec.'s (1-3). OR  Lectures 7&amp;9 (power point slides on BB).  <b>Watch videos for week 6</b></p>	<p>-H.W.# 3 due on Sunday, Oct.4<sup>th</sup>, at 11:59 pm  -Quiz #3 on Thursday, for 30 min.</p>	
<p><b>Week -7</b> 10/5-10/11</p>	<p>-Equations of Motion: *Rectangular Coordinates  *Normal and tangential Coordinates</p>	<p>- <b>Read:</b> Chapter-13, Sec.'s 4&amp;5. OR  -Lectures 10&amp; 11 (power point slides on BB).  <b>Watch videos for week 7</b></p>	<p>-Reading Quiz, due on Sunday at 11:59 pm</p>	<p>Blackboard Collaborate Ultra meeting, from 10:30 to 11:50 am.Group Solving problems and discussions].</p>
<p><b>Week -8</b> 10/12-10/18</p>	<p>- The Work of a Force, The Principal of Work and Energy &amp; System of Particles  -Power and Efficiency</p>	<p>- <b>Read:</b> Chapter-14, Sec. 1-3, &amp;4. Or  -Lectures 12&amp;13 (power point slides on BB).  <b>Watch videos for week 8</b></p>	<p>- H.W.# 4 due on Sunday, Oct.18<sup>th</sup>, at 11:59 pm  -Reading Quiz, due on Sunday at 11:59 pm</p>	<p>- F2F class (Tuesday), Group Solving Problems and Discussion.</p>



<b>Week-9</b> 10/19-10/25	Conservative Forces, Potential Energy, and Conservation of Energy	<b>Read:</b> Chapter -14, Sec.'s (5-6). OR  -Lecture 14 (power point slides on BB).  <b>Watch videos for week 9</b>	<b>-Exam #2 on Tuesday, Oct.20<sup>th</sup> from 10:30 to 11:50 am. in class</b>  -Reading Quiz, due on Sunday at 11:59 pm	F2F class
<b>Week-10</b> 10/26-11/01	-Principle of Linear Impulse and Momentum - Conservation of Linear Impulse and Momentum for Systems of Particles.  -Impact	<b>Read:</b> Chapter -15, Sec.'s(1,2-3,4) OR  -Lectures15 &16 (power point slides on BB).  <b>Watch videos for week 10</b>	-H.W.# 5 due on Sunday, Nov.1 <sup>st</sup> , at 11:59 pm  -Quiz #4 on Thursday, for 30 min.	
<b>Week-11</b> 11/02-11/08	Angular Momentum, Moment of a Force, Principle of Angular Impulse and momentum  -Planar Rigid Body Motion: Translation and Rotation	<b>Read:</b> Chapter-15- Sec.'s(5-7), and Chapter -16, Sec.'s(1-3). OR  -Lectures 17 &18 (power point slides on BB).  <b>Watch videos for week 11</b>	-Quiz #5 on Thursday, for 30 min.  Reading Quiz, due on Sunday at 11:59 pm	-F2F class on Tuesday, Group Solving Problems and Discussion.
<b>Week-12</b> 11/09-11/15	-Moment of Inertia	<b>Read:</b> Chapter -17, Sec.'s (1). OR  -Lecture 19 (power point slides on BB).  <b>Watch videos for week 12</b>	<b>-Exam#3 on Tuesday, Nov.10<sup>th</sup> from 10:30 to 11:50 am. in class</b>  -H.W.# 6 due on Sunday, Nov.15 <sup>th</sup> , at 11:59 pm	F2F class



<b>Week-13</b> 11/16-11/22	-Moment of Inertia  -Planar Kinetic Equations of Motion: Translation	<b>Read:</b> Chapter -17, Sec.'s (1, & 2-3). OR  -Lectures 19 &20 (power point slides on BB).  <b>Watch videos for week 13</b>	Quiz #6 on Thursday, for 30 min.  -Reading Quiz, due on Sunday at 11:59 pm	
<b>Week-14</b> 11/23-11/29	-Kinetic Energy, Work, Principle of Work and Energy  -Planar Kinetics of a Rigid Body: Conservation of Energy	<b>Read:</b> Chapter -18, Sec.'s (1-4, & 5). OR  -Lectures 21&22 (power point slides on BB).  <b>Watch videos for week 14</b>	H.W.#7 due on Sunday, Nov.29 <sup>th</sup> , at 11:59 pm	F2F class on Tuesday, Group solving problems and discussion.  <b>Thanksgiving Holiday, 11/26</b>
<b>Week-15</b> 11/30-12/06	-Planar Kinetics of a Rigid Body: Conservation of Energy	<b>Read:</b> Chapter -18, Sec.'s (5). OR  -Lectures 22 (power point slides on BB).	<b>-Exam#4 on Thursday, Dec.3<sup>rd</sup> (Online)</b>	<b>End of the Semester</b>

The above schedule, policies, and assignments in this course are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor and the students.