The University of Texas at Tyler
College of Engineering and Computer Science
Course Objectives, Syllabus, and Course Policy
SPRING 2022(January 10-April 30, 2022)

COURSE: **ENGR 2302.001 - DYNAMICS**
Lectures: Mondays & Wednesdays 3:00-4:25 pm scheduled in RBN2011.

TEXT: R. C. Hibbeler: Engineering Mechanics – Dynamics, Fourteenth Edition, Pearson, 2013(ISBN 978- 0-13-391538-9) **(OR)** any earlier cheaper edition of the same book having the same course contents.

INSTRUCTOR: Dr. M. Sathyamoorthy, Office – Engineering RBN3006 – 903 565 5939 – msathyamoorthy@uttyler.edu-- Office hours posted at the door and in Canvas—You can walk in anytime for help. Please wear your mask when you enter my office. If you are not wearing mask, I will meet with you outside the office.

COURSE INFORMATION

Catalog Description: 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.

ABOUT THE COURSE

Dynamics is the second of the three-course sequence in Mechanics, (Statics being the other), that is usually required of most engineering majors. Statics and Dynamics are introductory courses on basic engineering principles and engineering applications. These courses are taught at the beginning of engineering programs/curricula to provide an opportunity to find out if the student has the necessary aptitude to succeed in engineering. In-depth understanding of Statics and Dynamics is an absolute necessity for the study of other mechanics courses such as Strength of Materials, Thermodynamics, Fluid Mechanics etc. This course will be taught with a strong emphasis on understanding the fundamental theoretical concepts complemented by solutions to a number of example problems to reinforce the understanding of the theory discussed in class. It is important to note that the most effective way of mastering the course material is to solve as many classroom, practice and homework problems as possible.

PRE-REQUISITES

ENGR2301 or CENG2301-Statics is a prerequisite for this course with a minimum "C" grade.

COURSE SYLLABUS & TOPICS COVERED

The following topics will be covered in class. A flexible lecture schedule will be used to adjust the material covered to suit the background, interest and response of the students in order to maximize the overall benefits.

Introductory Chapter (Read notes posted in Canvas)
Chapter 12: Kinematics of a Particle, Sections: 12.1, 12.2, 12.4-12.10
Chapter 13: Kinetics of a Particle: Force and Acceleration, Sections: 13.1-13.

Exam 1 in class at UT Tyler Campus on February 9.

Chapter 14: Kinetics of a Particle: Work and Energy, Sections: 14.1-14.6
Chapter 15: Kinetics of a Particle: Impulse and Momentum, Sections: 15.1-15.7

Exam 2 in class at UT Tyler Campus on March 16

System of Particles: See posted notes
Chapter 16: Planar Kinematics of a Rigid Body, Sections: 16.1-16.7
Chapter 17: Planar Kinetics of a Rigid Body: Force and Acceleration, Sections: 17.1-17.5 & Chapter 22: Vibrations, Sections: 22.1-22.3

Exam 3 in class at UT Tyler Campus on April 18

2-HOUR FINAL COMPREHENSIVE EXAMINATION will be scheduled during the final exam week, April 26-30. The exact date will be announced by UT Tyler.

ATTENDANCE:

Dynamics is one of the challenging courses in engineering. Therefore, **regular attendance is required**. Attendance will be taken in each class for my records. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made on home works, exams etc. If you **miss more than 5 classes, you will be administratively dropped** from the class.

ASSESSMENT: HOMEWORK:

Homework is a very important part in understanding the course material. Completing your homework as much as possible independently is an absolute necessity to do well in this course. Therefore, I strongly urge each of you to complete the homework assignments independently for your own benefit. Homework assignments and solutions are posted in Canvas. Homework will **NOT** be collected or graded. You are also encouraged to work in groups to solve homework problems and learn from each other. Also, use the Pass Tutoring Center (PTC) to get help if PTC offers tutoring sessions. If offered, PTC will schedule regular tutorial sessions every week and the schedule will be posted in Canvas.

EXAMS:

Closed-book, closed-notes exams will be given after completing a reasonable amount of material from the text as shown earlier. A final 2-hour **COMPREHENSIVE** examination will be given during the final exam week. You may use a one-page, self-written notes (cheat sheet with no problem solutions of any kind) for reference in each of the exams and the final examination. The cheat sheet will be collected with exam papers. A formula sheet will be posted in Canvas before each exam and it will also be included with the exam. If you miss any exam without getting **prior approval from me at least one week before the test date**, your exam score will be counted as zero in the calculation of your final course grade. If you were given an official excuse, then the

percentage will be added to your final exam. **Please note that there are no makeup exams**.

FINAL GRADES:

Final grades are based on:

3 Exams @ 20 points each	60 points
Final Comprehensive Exam	40 points
Total	100 points

NOTE

Course syllabus, course material such as handouts and statement of problems solved in class, homework assignments, homework solutions, review material, exam solutions are all posted in Canvas. Please review all the material posted in Canvas on a regular basis. I will use Canvas to post announcements and contacting students by e-mail.

CALCULATOR POLICY: You are allowed to use the scientific calculator TI-30X IIS at each exam. Use this link to find a list,of approved calculators. https://ncees.org/exams/calculator/ You are not be allowed to use any other calculator or store any class material in the calculator during the exams. You cannot have i-phones, i-pads, i-watches or other electronic devices with you. If you bring i-phone or other electronic devices to the room, please leave them in your bag. I strongly recommend that you buy the TI-30X IIS calculator (for about $12) and get familiar with its use before the first examination.

MANDATORY TUTORIAL SESSIONS

Whenever your exam score falls below the class average (class average will be announced after each exam), you are required to attend at least 5 one-hour tutorial sessions offered by the Pass Tutoring Center (PTC) prior to the next exam date. If PTC does not offer tutoring sessions, use Upswing which is free for UT Tyler students. You can do this at one session of 5 hours or 5 sessions of 1 hour each depending upon your convenience. This requirement will be strictly enforced. Days and times for tutorial sessions will be posted in Canvas, if PTC offers them. If you do not attend these mandatory tutorial sessions, **you are not eligible for grade replacement** incentive noted below.

GRADE REPLACEMENT INCENTIVE

Please note that the final exam is a comprehensive exam. In computing your final course grade, your lowest exam grade (from exam 1, 2 or 3) will be replaced by the final exam grade if you did really well in the final exam. In other words, if your final exam grade is better than any of your earlier exam grades, it will be used to replace the lowest grade and will also be used as your final exam grade. **Make sure that you attend the mandatory tutorial sessions.** If you do not attend these mandatory tutorial sessions noted below, you **are not eligible for grade replacement** incentive.

THERE WILL BE NO MAKE-UP EXAMS. The percentage of any exam missed by a student will be added to his/her final comprehensive exam only if prior approval is granted. The student is responsible to contact me at least a week before the scheduled exam date to get the approval. If you have to miss an exam due to emergencies (such as medical and other emergencies) please inform me as soon as possible before or **immediately** after the exam. Class average for each exam will be announced in class and posted in Canvas after each exam. You can use these class averages to estimate your standing at any time. If the class averages for the 3 exams are a, b, and c, then the overall class average before final exam (excluding the project) will be 0.2(a+b+c).

Compare this with your numbers to see your status. Cut-offs for A, B, C, D, and F grades will be determined only after the project and final exam grades are known. If your grade is consistently at or close to the class average you will get a "C" grade. Final course grades will be determined on the basis of the class average. If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify me at least one week prior to the date of the planned absence. If you miss any exam without getting **prior approval from me at least one week before the exam date**, it will be counted as zero in the calculation of your final course grade.

Cheating of any kind will not be tolerated. If you try to cheat, your score for that exam will be **"0"** and the incident will be reported to the University for scholastic dishonesty and further disciplinary action. The zero will not be replaced and will be counted towards your final course grade.

University, College, and Department Policies:

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, or material which has been submitted within a different course without explicit approval of the instructor, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials, or devices and instruments allowing access to materials, which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes" as well as cell phones, to name a few. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student or person during a test or other assignment without explicit authorization;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, or removing material from the exam location, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;

- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.
- "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
- All written work that is submitted will be subject to review by plagiarism software.
- Penalty for any related infractions will be decided at the discretion of the instructor including, but not limited to, granting of a failing grade in part or the course or in the entire course.

Students Rights and Responsibilities
To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

- ***Information for Classrooms and Laboratories*:** Students are expected to wear face masks covering their nose and mouth in public settings (including classrooms and laboratories). The UT Tyler community of Patriots views adoption of these practices consistent with its Honor Code (Links to an external site.) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, digestive issues (e.g. nausea, diarrhea), or a higher than normal temperature should stay at home and are encouraged to use the UT Tyler COVID-19 Information and Procedures (Links to an external site.) website to review protocols, check symptoms, and report possible exposure. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions
Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Campus Carry
We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University
All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.
Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless
tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support.
For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.
The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms , requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).
Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must

notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement
It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation
Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

ENGR 2302- Spring 2022-Course Schedule
NOTE: This is a flexible schedule and adjustments may be made as needed

Chapter	Topic	Classes on	Homework Due on
Intro Chapter	Introductory Chapter	January 10, 12, 19	January 20
Chapter 12	Kinematics of a Particle	January 24, 26, 31	January 26, 28
Chapter 13	Kinetics of a Particle	February 2, 7	February 2, 8
		Exam 1 on February 9	**In Class**
Chapter 14	Work and Energy	February 14, 16, 21	February 22, 28
Chapter 15	Impulse and Momentum	Feb 23, 28 & Mar 2	March 5, 12
		Exam 2 on March 16	**In Class**
Chapter 16	Kinematics of a Rigid Body	March 14, 21, 23	March 22, 29
	System of Particles	March 28	April 5
Chapter 17	Kinetics of a Rigid Body	Mar 30 & Apr 4	April 12
		Exam 3 on April 18	**In Class**
Chapter 22	Vibrations	April 6, 11, 13	No Homework
	Final Comprehensive exam	**Final Exam Week**	**To be Announced**

- 24 Lectures, 3 exams and a final comprehensive exam in Class

COURSE OBJECTIVES: By the end of this course students will be able to:

1. Set up and solve particle kinematics problems using rectilinear and curvilinear, planar and three-dimensional, coordinate systems.
2. Set up and solve kinetics of particles problems, planar and three-dimensional, using Newton's second law, work and energy, and impulse and momentum methods.
3. Set up and solve kinematics of rigid bodies problems in planar coordinate systems.
4. Set up and solve kinetics of rigid bodies problems using Newton's second law,

work and energy, and impulse and momentum methods.