TRANSPORTATION ENGINEERING

SUBJECT: CENG 3351 Spring 2020

1. Welcome to CENG 3351, the first course of your transportation engineering classes under the civil engineering During the upcoming semester, I believe you will find our study of transportation engineering systems as well as pavement design and analysis to be interesting, challenging, and rewarding.

2. In this course you will learn the fundamentals of Transportation Engineering and be mainly introduced to the engineering analysis (and some design) You will be applying the principles from previous math, physics, and programming courses throughout this course and we will work to maximize the use of your computer in support of our work. In addition our goal is to provide you with a solid foundation in understanding transportation engineering systems. This course has 6 specific objectives as shown in page 7. They can be generally grouped and summarized as learning about geometric design of highways, traffic engineering (i.e., traffic studies, capacity analysis, and signal control), transportation planning, and a variety of traffic software, and applying them to solve real world transportation engineering analysis and design problems.

3. I teach 4:30 pm - 7:15pm Thursday in C204. If you will miss a scheduled class, you are still responsible for the
4. Class Room Procedures:

1. Bring study notes, textbook, note-taking material, and calculator to every You may not borrow or exchange calculators during graded events. Class preparation is your individual responsibility.

1. Textbook: [MKW] Mannering, L., and Washburn, S.S.
(2013). *Principles of Highway Engineering and Traffic Analysis*, 5thEdition, John Wiley & Sons, Inc. Available at the bookstore and web outlets.

Supplemental Textbooks/References: 1) Pavement Analysis and Design 2nd Edition by Huang 2) [GH] Garber, N.J. and Hoel, L.A. (2008). Traffic and Highway Engineering (4th Edition). PWS Publishing. 3) [PP] Papacostas, C.S. and Prevedouros (2001). Transportation Engineering and Planning, 3rd ed. Prentice Hall, Inc., Englewood Cliffs, New Jersey. ISBN-10: 0130814199. ISBN-13: 978-0130814197. This textbook is the one used before. 4) [MY] May, A.D. (1990). Traffic Flow Fundamentals, Prentice Hall, Inc., Englewood Cliffs, New Jersey. 5) American Association of State Highway and Transportation Officials (2004). A Policy on Geometric Design of Highways and Streets, AASHTO, Washington, DC. 6) Additional handouts/references/articles will be provided in due course. Have fun!

1. You are not required to use colored pencils or a straight edge, but colors and straight lines can help with emphasis and clarity in your

2. I will have unannounced quizzes although I may announce them (LOL)

1. **ACADEMIC DISHONESTY:** Representation of other's work as your own will not be Cheating on examinations, quizzes, and homework and the false representation of work will be interpreted as academic dishonesty. Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline.

5. Exams and Grading:

1. Grade Breakout and Cutoffs:

Course Points		**Grade Scale**
Problem Sets and Quizzes (30)	(30%)	A+ 96.67%..
Mid-term Exams (2)	(25%)	A 93.33%..

Instructor Grade	(10%)	A- 90.00%..
Projects (2)	(10%)	B+ 86.67%..
Final Examination	(25%)	B 83.33%..
	(100%)	B- 80.00%..
		C+ 76.67%..
		C 73.33%..
		C- 70.00%..
		D 65.00%..
		F <65.00%.....

- The dates for Mid-Term Exams are included in the course Official reasons for missing an exam are outlined in "Student handbook". You are required to take a make-up Exam, regardless of your reason for missing the scheduled Exam. Report any conflict to me as soon as possible prior to the Exam.

6. Homework: All homework is mandatory and becomes part of your grade, failure to submit any required homework will result in an As an engineer your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such both your presentation and the accuracy of your work are important, and both will be graded. In order to insure correctness and model professional CE practice, this semester we will often encourage you to discuss with your classmates and submit all your work to your classmates for "Review". It is critical that you show all of your work and leave "foot prints" so that it can be easily followed. No guess work should be required to see what you did. **All submissions must be turned in by the beginning of the class on the due date and this rule will be strictly enforced throughout the semester**. **5% Extra credit will be given for each fully computer- typed homework assignments.**
    1. Problem Sets (PS)

- Include a title

- **Use Engineer paper only or full-page printouts from Microsoft word, Mathcad, Excel,** You may neatly tape or glue short computer printouts onto Engineer paper at the appropriate place in the logical flow of the problem. Only use one side of a page. Clearly present **a brief problem statement and a sketch** with your solution. Clearly and concisely explain each step. For narratives of more than a line or two, use your word processor or the text capability if you are using MathCAD or Excel. If you are writing out a paragraph or more, you must type it.

- Late It is a basic principle of professionalism that **"Professionals are not Late."** A "COORDINATED LATE" submission occurs when you will miss the suspense for a graded homework assignment and you contact me in advance. Notification immediately before the submission will not suffice. Point cuts up to the amounts below **may** be assessed for a "COORDINATED LATE" submission:

1. 0-24 hours late a deduction of 25% of the earned grade
2. 24-48 hours late deduction of 50% of the earned grade
3. More than 48 hours late No **Assignments must still be submitted.**

Obviously there are circumstances that will occur and make a timely submission impossible and I will work with you when and if they occur.

- All homework in this course must be properly As you are discussing and/or having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me is considered immediately available to all students and need not be acknowledged or documented. **YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED.** Documentation will be accomplished in accordance with any manual for writing, footnote or endnote, for papers, but for written homework, just place the documentation right at the point you received help using who and what assistance.

1. Assigned Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover

(***I will not cover everything***). It will also make you more familiar with terms and concepts to be covered. To help motivate you to do the reading there will be quizzes that you are required to complete prior to class on most readings. Be sure to check Blackboard, under assignments in a folder called Reading Quizzes. But I may or may not announce these quizzes in advance.

1. There will be one group projects in the middle of this course and one final project which will be individual. For group projects, you are encouraged to discuss, wrap up the work together, and learn from each other. For the individual final project, you can discuss the given problem with your classmates, but you must work and get everything done on your own as each projects are different. However, you are always encouraged to get any help from me.

7. There will be several opportunities to earn bonus points for outstanding work on problem sets and for completion of other optional Opportunities for bonus points will be clearly identified by me and announced in class. Make use of these opportunities to extend your learning!

8. **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 (Links to an external site.)

9. **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 Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. (Links to an external site.) 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 that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No
- Receiving 100% refunds for partial (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

10. **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 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 (**January 28th, 2019**).

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.

Topics Covered and Schedule (Tentative and Subject to Change)

Date	Day	Materials Covered		
1/16/2020	TH	Course Syllabus		
1/23/2020	TH	Transportation Finance	Transportation Modes & ITS	CH 1
1/30/2020	TH	Equations of Motion & Human Factors		CH 2
2/6/2020	TH	Horizontal Alignment		CH 3
2/13/2020	M	Census Date		
2/20/2020	TH	Vertical Alignment	Stopping/Sight Distance	CH 3
2/27/2020	TH	Horizontal/Vertical Problem Solving Session		CH 3
2/27/2020	TH	Exam#1 Review		
3/5/2020	**TH**	**Exam #1**		
3/19/2020	TH	Traffic Flow - Vehicle Stream Variables/Models		CH 5
3/26/2020	TH	Stream Measurements		CH 5
4/2/2020	TH	Highways: Uninterrupted Flow	LOS Basic Freeway	CH 6
4/9/2020	TH	LOS Multilane		CH 6
4/16/2020	TH	NO CLASS		
4/23/2020	TH	Design Traffic Volumes		CH 6
4/30/2020	TH	Highways: Interrupted Flow	Signalized Intersection	CH 7
4/30/2020	TH	Highways: Interrupted Flow	Signal Phasing and Timing	CH 7
		Exam #2		

Exam Week April 30 - May 4 Final Exam

CENG 3351 Transportation Engineering Course Objectives:

1. Develop an organized approach to solving transportation system analysis and design
2. Explain the transportation system facilities, flow, and control system from the supply and demand perspective, different transportation modes and their pros and cons, and current issues and technologies used in the transportation
3. Explain the motions, braking distance, the human factors, horizontal/vertical alignment, superelevation design, stopping/passing sight distance, channelization, roundabouts, and traffic calming devices in road
4. Analyze vehicle stream models, relationship among flow/speed/concentration, and time-distance diagrams of flow, the capacity and level of service for both highways and freeways, signal detectors and controllers, signal timing, pretimed and actuated signal
5. Design flexible and/or rigid pavements based on existing or projected traffic conditions, soil conditions and expected service
6. Use commercially available software (such as PaveXpress) as a tool to perform traffic simulation and pavement

HOMEWORK FORMAT RULES

In doing your homework, you are required to follow the instructions listed below:

- Use a pencil - Do NOT use a
- Completely erase any extraneous material - NO scratched out material should appear on the solutions
- Show all the pertinent details of how you obtained your solution
- Staple your assignment together - Do NOT use paper clips, dog-earing, or other means to assemble your
- Write legibly, in print large enough to be easily read.

- Use 8 ½ by 11 inch engineering Do NOT use paper torn from a spiral binder unless it is perforated and you can neatly remove the ragged edge.
- Use graph paper on problems requiring graphs
- Use straight edges to draw diagrams, schematics,

Each homework problem must follow the structure given below:

Given: Concisely state the problem, including relevant sketches, units, etc. *Determine*: State what is the goal of the problem (i.e. what is unknown) *Assumptions:* List all assumptions used in solving the problem

Double underline or put a box around your final answer.

Solution: Draw a Free-Body-Diagram and give a step-by-step solution of the problem, including explanatory sentences. **Be careful to keep track of units**, and

Additional features of a **GOOD** homework

- Each problem should have a neatly drawn If you are not a true artist, you should use a straight edge. Also, the figure should be large enough to be easily read and important variables associated with the problem should be labeled on the figure. A well drawn figure will greatly help you solve the problem and help me understand your solution
- Each solution should be well Labels for parts a), b), c) etc. should be easy to locate and the solution should be placed in the proper section.
- Don't cram your solutions into a small There should be lots of "white space" in your solution. Leave blank lines between steps; this makes it much easier to grade and gives me room to make comments. Also, leave several blank lines between problems so that I can easily see where one problem ends and the next begins. **I would prefer that you start each problem on a new page.**
- A homework solution should be capable of being "read" just like a textbook example This means that you include all the pertinent details of the solution as well as text to help the reader follow you analysis. (Include sentences in your solutions not just equations.) Explain what you are doing, tell where you have taken an equation from, etc.
- Any variable used should be described in words or clearly shown on a
- For nearly every problem your approach should be:
    1. While you are writing the given & find think about the Think about what you know and don't know; think about which fundamental law might relate the quantities; form a strategy!

2. Start your solution with a very general equation (such as Newton's law, conservation of energy, conservation of momentum, etc) The equation should be written with symbols
3. Simplify the equation and state why you have made your Show all of the details. There should be words in your solution.
4. Once the equation is simplified, then plug in the **EVERY NUMBER REPRESENTING A PHYSICAL QUANTITY MUST HAVE UNITS WITH IT!!!**
5. Calculate the final answer and determine the final (Don't just slap the final units on)
6. **Ask yourself if the answer makes sense** (e.g. you calculated a negative velocity but the object is moving to the right - correct solution: go back and look for your error; wrong solution: slap in a negative sign somewhere and hope the teacher doesn't)
7. Only at this point should you check you answer with the book's answer. If you are off, go back and rethink you If you can't find a good reason for you mistake, **DO NOT JUST FORCE THINGS TO GET THE CORRECT ANSWER; COME AND SEE ME SO THAT I CAN HELP YOU FIND YOUR MISTAKE!!!!** J

UNIVERSITY POLICIES AND ADDITIONAL INFORMATION

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.

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 (Links to an external site.)

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 (Links to an external site.)

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. (Links to an external site.)

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. (For Fall, the Census Date is Sept. 12.) Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. (Links to an external site.)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 (Sept. 12th) 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

- Receiving 100% refunds for partial (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 Tyler at Texas offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible a 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 (Links to an external site.)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 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, (Links to an external site.) 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.

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, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

1. “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 which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. 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 during a test or other assignment without authority;
    - 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, 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

1. “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

- “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

1. All written work that is submitted will be subject to review by SafeAssignTM, available on

Vanesha Nicholson, MBA

vnicholson@uttyler.edu