MEMORANDUM FOR STUDENTS ENROLLED IN CENG 5357

SUBJECT: Public Transportation Engineering Administrative Instructions, AY101S

1. Welcome to Public Transportation Engineering, one of the transportation graduate course you are required to take to get a graduate degree in civil engineering. During the upcoming course, I believe you will find our study of Public Transportation Engineering in general to be interesting, challenging, rewarding, and fun! We will meet IAW the course schedule (see Encl 1). My bio and contact information is attached (Encl 2).

2. In this Public Transportation Engineering course you will learn the state-of-the-art and state-of-the-practice of the public transportation systems engineering design and analysis. You will be studying on the introduction to public transportation systems, including planning, design, management, and operations of mass transit systems in urban and rural areas; principles of transit demand forecasting; optimal transit route network design; and driver and vehicle scheduling. In addition, you will be given the opportunity to applying the principles learned throughout this course and we will work to maximize the use of your computer in support of our work. This course has 4 specific objectives (see Encl 3).

3. Your professor will teach based on the schedule in Enclosure 1. If you will miss a scheduled class, you are still responsible for the material and will not get the participation points available for each lesson unless an authorized absence.

4. You are encouraged to seek additional instruction (AI, office hours?) during the following general times …..M-F 1-3 PM or after class or by simply arrange a mutually agreeable time. Take advantage of AI, it's FREE and really will help! Use e-mail (wfan@uttyler.edu) to coordinate a time outside of office hours.

5. Class Room Procedures:
   a. We will take daily time survey data – please ensure the Time Survey Sheets are circulated.
   b. Bring study notes, textbook, note-taking material, and calculator to every class. Class preparation is your individual responsibility.
   c. Textbook: There is no required textbook for this course. However, they are several books that you can possibly use for your own references such as: 1) Urban Transportation Systems, 1st Edition, by S. Grava, Published by McGraw-Hill, ISBN 0-07-138417-0, 2002. 2) Additional handouts/references for the use of traffic software will be provided in due course. Have fun!
   d. We will have announced and unannounced reading quizzes as well as participation points. Class preparation is your individual responsibility. Students are expected to attend class, participate in discussions, answer questions presented in class and be responsible for all material and announcements discussed in class.
   e. ACADEMIC DISHONESTY: Representation of other’s work as your own will not be tolerated. 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.

6. Exams and Grading:

a. Grade Breakout and Cutoffs:

<table>
<thead>
<tr>
<th>Course Points</th>
<th>Grade Scale</th>
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<tbody>
<tr>
<td>Problem Sets (6 at 70~100 each)</td>
<td>A+ 96.67%.1933</td>
</tr>
<tr>
<td>Mid-term Exams (2 at 200 each)</td>
<td>A 93.33%.1866</td>
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<tr>
<td>Instructor Grade</td>
<td>A- 90.00%.1800</td>
</tr>
<tr>
<td>Projects (1 at 400 each)</td>
<td>B+ 86.67%.1733</td>
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<tr>
<td>Final Examination</td>
<td>B 83.33%.1666</td>
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<td>Total</td>
<td>B- 80.00%.1600</td>
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<td></td>
<td>C+ 76.67%.1533</td>
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<td></td>
<td>C 73.33%.1466</td>
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<td>C- 70.00%.1400</td>
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<td>D 65.00%.1300</td>
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<tr>
<td></td>
<td>F &lt;65.00%&lt;1300</td>
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</tbody>
</table>

If you earn less than 65% on all Exams or if you fail to earn at least 50% on the Final, you may fail
the course, **regardless of your course grade**. Of course, final grades are only A, B, C, D, F.
Therefore, a C- is a C for a final grade. This distribution is to graphically remind you of how well you
are doing. **University grade breaks will be used in final grade posting.**

7. How You Should Prepare for Lessons

1. **Study:** Public Transportation Engineering is as challenging as any course you will have at The
University of Texas at Tyler. President’s policy states that you are expected to spend **120-180 minutes on average**
outside of class for each hour that you spend in class. Make sure that you completely and thoroughly understand the lesson that was just covered in class before moving on to the next lesson. Familiarize yourself with the upcoming lesson so that you get the most
learning possible out of the time that you spend in class. A “rule” for time allocation is 85% on
the lesson just covered, 15% on the upcoming lesson. When studying you should focus on
accomplishment of the individual learning objectives listed for each lesson. This will normally
include development of an understanding of the definitions of new words for each lesson as
well as the assumptions, principles, and procedures used in solving the example problems.

2. **Use the Text:** Our recommended text was carefully selected from many available texts because
the author does such a fine job explaining difficult concepts. You will find the illustrations in
the text to be very informative and the numerous examples very practical and straight forward.
Read and study the assignment in the text, paying particularly close attention to principles,
assumptions, and examples.

3. **Solve Problems:** **This is the absolute key to success in this course!** No scientific or
mathematical subject can be mastered without working problems. The more problems you
work yourself, the better you will understand the principles involved. Problem sets are
assigned throughout the course and must be completed and turned in for grade. In addition, it
will help if you work additional problems. I will provide some in the study notes. They are
selected to cover the scope of the lesson. You may help each other in working these problems,
but it will be much better for you to try to do them yourself before asking for help. Do not be
satisfied with just getting the answers. Always try to understand the principles and process you
used to solve each problem. The problems complement the lessons and should be worked and
reviewed.

4. Prepare Your Notebook: The record shows that the best students keep the best notebooks. You
should organize your notebook so that all material for each lesson can be easily referenced.

5. Build a Strong Team: Working in teams on assigned work and in preparation for graded events
such as Exams is not only allowed, but encouraged. Building a strong team will assist with
peer-to-peer learning and will save you time. However…bottom line: document assistance
from your buddies as you all move toward success!

8. Graded Events: All Graded Events are mandatory and becomes part of your grade, failure to submit
any required work will result in an incomplete. As a leader 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. All submissions
are due in class and must be turned in directly to me by 5:30PM (i.e., RIGHT BEFORE the
class) on the due date and this rule will be strictly enforced throughout the semester. Additional
guidance:

a. PROBLEM SETS: Homework should be submitted individually, but you can collaborate on it.
Collaboration is not copying from another. It is asking a classmate what is the answer and
comparing solution techniques to determine who is more correct.

b. ASSIGNED READING. 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 (We
will not cover everything since independent learning is a desired result, you will learn some
topics on your own from the textbook). It will also make you more familiar with terms and
concepts to be covered. To help motivate you to do the reading there may be quizzes that you are
required to complete prior to class on most readings.

c. PROJECTS. There will one final project in this course which will be individual. The
candidate list of the project is provided as attached. For the individual final project, you
can discuss the given problem with your classmates, but your must work and get
everything done on your own as each projects may be different. However, you are always
couraged to get any help from me.

9. Late Submissions. 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 a deduction of 50% of the earned grade
3. More than 48 hours late No credit. 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.

3 Enclosure 1 Course Topics and Schedule.
All work in this course must be properly documented. As you are 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 (unless you directly copy or paraphrased content). **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.

10. There will be several opportunities to earn bonus points for outstanding work on problem sets and for completion of other optional assignments. Opportunities for bonus points will be clearly identified by the instructor and announced in class (another reason to attend class). Make use of these opportunities to extend your learning!

11. 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.ttyler.edu/wellness/StudentRightsandResponsibilities.html](http://www.ttyler.edu/wellness/StudentRightsandResponsibilities.html)

12. Grade Replacement/Forgiveness. If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

13. 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 12th day of class (See Schedule of Classes for the specific date). Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard. Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

14. Disability Services. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079.

15. 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.

16. 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.
17. 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.

18. 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.

Encls

Wei (David) Fan
Ph.D., P.E.
CENG 5357
### Topics Covered and Schedule

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>LESSONS</th>
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<tbody>
<tr>
<td>Course Syllabus,Intro and Overview</td>
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<tr>
<td>Introduction, Demand Estimation, and Statistical Tools</td>
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<tr>
<td>Industry Characterization, Operational Problems</td>
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<tr>
<td>Federal Legislation and Characterization of Transit Modes</td>
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<tr>
<td>Sketch Planning Models, Statistical Tools, Hypothesis Testing and Regression</td>
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<td>Conceptual Framework for Estimating Transit Demand</td>
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<td>Route Design</td>
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<td>Routing Considerations, Pattern Types</td>
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<td>Terminal or Stop Spacing</td>
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<td>Vehicle Scheduling</td>
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<td>Vehicle/Route Capacity, Passenger Demand and Cycle Time</td>
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<td>Modeling of Passenger Boarding/Deboarding - Poisson Processes</td>
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<td>Driver Scheduling</td>
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<td>Demand Estimates per Analysis Period</td>
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<td>Labor Contract Constraints, Vehicle Schedule, Driver Schedule</td>
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<td>Networks</td>
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<td>Concepts, City Forms, Network Types, Progression and Evaluation</td>
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<td>Rail Transit</td>
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<td>Selection Considerations</td>
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<td>Capacity Comparisons, Local Bus, HOV Lanes, Light and Rapid Rail</td>
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<td>Cost Comparisons</td>
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<td>Design (Guideway, Stations, Vehicles, Capacity Calculations, ROW)</td>
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<td>Light Rail Transit Operations (Right of Way and Street Intersection)</td>
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<td>Propulsion Systems</td>
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<td>Vehicle Motion, Resistance to Motion, and Propulsion</td>
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<td>Para-Transit Concepts</td>
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<td>Dial-a-Ride, Taxi, Car Pools, Van Pools, Jitneys, Transport Brokerage</td>
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<td>Evaluation</td>
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<td>Impact vs. Administrative Evaluation Processes</td>
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<td>Engineering Economic Analyses</td>
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<td>Course Summary</td>
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<td><strong>Total Lessons</strong></td>
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<td>28-Sep</td>
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<td>5-Oct</td>
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<td>19-Oct</td>
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<td>9-Nov</td>
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<td>16-Nov</td>
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<td>13</td>
<td>23-Nov</td>
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<td>14</td>
<td>30-Nov</td>
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<td>15</td>
<td>7-Dec</td>
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<tr>
<td>Exam Week</td>
<td>14-Dec (Tuesday)</td>
</tr>
</tbody>
</table>

**As of August 18, 2010**
Dr. Wei (David) Fan  
Position: Assistant Professor  
Office Building/Room: RBS 1005 (Ratliff Building South)  
Phone: (903) 565-5711  
Email: wfan@uttyler.edu  
Office Hours: M-F 1-3 PM  

Education
The University of Texas at Austin Civil Engineering - Transportation PhD May 2004

Professional Society
Associate Editor, IEEE Transactions on Intelligent Transportation Systems, 2007 – Present  
Member, Editorial Board, World Review of Intermodal Transportation Research, 2007 – Present  
Member, Editorial Board, International Journal of Revenue Management, 2007 – Present  
Member, Technical Committee on Emerging and Innovative Public Transport and Technologies (AP020), Committee on Transportation and Economic Development (ADD10), and Committee on Paratransit (AP060), Transportation Research Board, National Research Council, National Academy of Sciences and National Academy of Engineering, 2007 –
Member, Technical Advisory Panel (TAP) for the Research Management Committee 2 (RMC-2) and Committee 4 (RMC-4) of the Texas Department of Transportation, Austin, Texas

Reviewer:
Prestigious Journals refereed: (Reviewed more than 40 journal papers in the past two years)
Transportation Science  
Transportation Research Record (TRR), National Research Council, National Academy of Sciences  
Transportation Research Part C: Emerging Technologies  
ASCE Journal of Transportation Engineering  
ASCE Journal of Computing in Civil Engineering  
ASCE Journal of Computer-Aided Civil and Infrastructure Engineering  
Journal of Public Transportation  
Journal of Transport Geography  
Journal of the Eastern Asia Society for Transportation Studies  
IEEE Transactions - Intelligent Transportation Systems  
World Review of Intermodal Transportation Research International Journal of Revenue Management  
European Journal of Operational Research
Conferences refereed: (Reviewed more than 20 manuscripts in the past two years)
Transportation Research Board (TRB), National Research Council, National Academy of Sciences

Journal Publications, Conference Proceedings, and Presentations (Over 30)

Course Taught Before at UT Tyler
ENGR 2301 Statics  
CENG 2336 Geomatics  
CENG 2353 Civil Engineering Measurements  
ENGR 3301 Probability & Statistics for Engineers  
CENG 3351 Transportation Engineering  
CENG 4351 Traffic Engineering: Operations and Control (with Lab)  
CENG 5353 Operations Research and Advanced Mathematics (Graduate Level)  
CENG 5354 Urban Transportation Planning (Graduate Level)  
CENG 5355 Transportation Systems Management and Operations (Graduate Level)

Personal Information
Wife, Grace  
Daughter, Jennifer, Age 5 years  
Son, Peter, Age 3 years

Professional Registration: Professional Civil Engineer, Texas, 2009

Favorite Movie: Forrest Gump  
What’s Love Got to Do with It?
Favorite Sports & Team: NBA, San Antonio Spurs
Hero: Tim Duncan  
Super Hero: Grace

Enclosure I Course Topics and Schedule.
CENG 5357 Public Transportation Engineering Course Objectives:

1. Develop an organized approach to analyzing and solving public transportation systems engineering problems in urban and rural areas.
2. Explain the state-of-the-art approach to the analysis of transit operations.
3. Apply advanced mathematical modeling techniques to estimate and forecast transit demand.
4. Formulate and develop solutions to optimal transit route network design, and driver and vehicle scheduling problems.
Attachment 4

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

- Use a pencil - Do NOT use a pen.
- 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-ear, or other means to assemble your hw.
- Write legibly, in print large enough to be easily read.
- Use 8 ½ by 11 inch engineering paper. 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, etc.

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.

**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 double underline or put a box around your final answer.

Additional features of a GOOD homework:

- Each problem should have a neatly drawn figure. 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 organized. 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 space. 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 problem. 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 figure.
- For nearly every problem your approach should be:
  1. While you are writing the given & find think about the problem. 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 only.
  3. Simplify the equation and state why you have made your simplifications. Show all of the details. There should be words in your solution.
  4. Once the equation is simplified, then plug in the numbers. EVERY NUMBER REPRESENTING A PHYSICAL QUANTITY MUST HAVE UNITS WITH IT!!!
  5. Calculate the final answer and determine the final units. (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 notice.)
  7. Only at this point should you check you answer with the book’s answer. If you are off, go back and rethink you analysis. 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!!! 😊