Rubric	CIVL4630 (Spring 22-23)
Title of course	Public transport planning and operation
Instructor	Sisi Jian
Course catalog description, prerequisites, and credit	Public transport systems are recognized as a critical component in addressing urban mobility challenges, including congestion, air quality, and accessibility. This course focuses on approaches of planning, designing and operating public transport systems. It introduces traditional and innovative public transport modes, services and systems. It covers the demand modeling of public transport modes, the network planning of public transport routes and services, the operation optimization of public transport timetable setting and vehicle and crew scheduling, and the performance evaluation of public transport systems. *Prerequisite:* CIVL2170 *Corequisite:* CIVL3610 *Credit:* 3
Textbook(s) and/or other required material	Reference book: Ceder, A. (2016). Public transit planning and operation: Modeling, practice and behavior. CRC press.
Course objectives	This course will enable students to: 1. Fill in the gap and learn the fundamental theory and models of public transport planning and operation. 2. Comprehend and apply theoretical methods to solving real-world public transport problems.
Topics	This course will cover the following topics: 1. Introduction to public transport planning and scheduling 2. Public transit modal characteristics and roles 3. Forecasting Transit Ridership 4. Measuring Transit Quality of Service 5. Transit network design 6. Transit assignment 7. Traffic flow and public transit priority 8. Timetable balancing 9. Crew scheduling 10. Transit feeder/shuttle service design
Computer usage	N.A.
Laboratory projects	N.A.
Class/laboratory schedule	Lecture: 3 hours/week, Lab tutorial: 1 hour/week
Contribution to the professional component	100% engineering topics
Relationship to program objectives	This course contributes to the following program objectives: **POE2 Train students with good communication skills so they can work effectively in large projects involving different parties and professionals.** Students will work in a team in the group project and learn how to manage a project from proposing a research question to presenting the project results. **POE4 Expose students to real world engineering projects as well as cutting edge research to improve their understanding of the**

	profession and technological advancements that can improve current practice. Students will work on realistic transportation "big data" and identify real-world research questions they are interested to solve.
Relationship to program outcomes	This course contributes to the following program learning outcomes: **1. Obtain fundamental knowledge in mathematics and science** Students will learn the fundamental knowledge of public transport planning and operation. **5. Formulate problems and propose feasible solutions** Students will learn how to identify problems in a real public transport system and solve the problem using mathematical models. Students will apply project design and data analysis methods to real problems. **8. Obtain in-depth knowledge in at least one specialized area** Students will learn in-depth knowledge in public transit demand modelling, operation approach and network design, and performance evaluation of public transit systems. **12. Stay abreast of contemporary issues** Students will work on real data obtained from either government website or APIs, and utilize public transport planning and operation approaches to evaluate existing public transport system performance, identify current issues, and propose solutions.
Assessment of outcomes	65% individual assignment (Outcomes 1, 5,8,12) + 35% Final exam (Outcomes 1, 5,8,12)
Prepared by	Sisi Jian
Date	October 17, 2022