

# **Transportation Program PhD Qualifying Exam Rules Summary of Requirements**

This document provides guidelines for administering and taking the pre-doctoral Qualifying Exam for the **Transportation Engineering** sub-specialty in the Department of Civil and Environmental Engineering at the University of Washington.

## **1. Qualifying Exam Purpose**

The purpose of the Qualifying Exam is to demonstrate to the program faculty that the student: (1) possesses sufficient breadth of knowledge of core subject matter; (2) the ability to apply basic principles to engineering problems; and (3) can proceed successfully with the in-depth research and learning needed to complete a Ph.D. degree. The Ph.D. Qualifying Exam is a Department requirement for all Ph.D. students in order to continue on to the Ph.D. The exam is not a Graduate School requirement.

## **2. When Taken**

The qualifying exam should be taken within one year (but no later than two years) of starting the PhD track following completion of a master's degree. In consultation with the PhD advisor and exam committee, exceptions to this timeline may be granted, but it is in the candidate's best interest to stay on this timeline as much as possible.

## **3. Eligibility**

A cumulative UW GPA of 3.0 is required to take the exam. This is a department requirement for all research areas. A 3.0 GPA is also required by the UW Graduate School for completed PhDs.

## **4. Examination Committee**

The qualifying exam committee of a student consists of all faculty members in Transportation Group of UW CEE. The chair of the qualifying exam committee is the student's assigned advisor within CEE if possible. The duties of the qualifying exam committee are to (1) administer the exam and (2) determine the outcome of the exam. The chair of the committee shall report the exam outcome to the Department Graduate Student Advisor.

**5. Schedule and Format:** The qualifying exam is administered once a year, normally during the week following the spring quarter exam week. The format of the exam is take-home written exam. The duration of the exam is five days: the students receive the exam by 9 am on Monday by email and must email their completed exam solutions by 5 pm on Friday. Please note that each examinee must work independently. No communication on the exam topics is allowed during the exam period. Students shall not discuss the intent of the questions, their solutions, or the phrasing of their solutions with anyone. **Doing so shall result in dismissal from the PhD program.**

All PhD students must pass the exam within two years of beginning the PhD program. All students are encouraged to take the exam during their first year in the PhD program at the University of Washington. Students not passing the exam may be given a second chance.

**6 Content:** Each tenure-track faculty member may contribute one question to the exam. Questions from research faculty are also welcome. Students are required to answer four questions: one from each of the following three areas (Planning, Operations, and Analytical Methods), and one optional. At least one of the four questions must be from the student's advisor.

Students taking the qualifying exam are encouraged to talk to each of the transportation faculty *prior* to taking the exam. Students are expected to master key concepts in each of the three areas. The list of courses listed under each area is provided below for information only. Key concepts in each course may be found on individual course websites or by talking to the faculty member who is teaching the course.

- **Planning**
  - CET 511 Planning for People and Freight (Goodchild)
  - CET 581 Travel Demand Forecasting (Chen)
  - CET 512 Transportation Data Collection (Chen)
  - CET 583 Transportation Energy & Sustainability (MacKenzie)
- **Operations**
  - CET 590 Traffic Systems Operations (Wang)
  - CET 591 Freight Transportation (Goodchild/McCormack)
  - CEE 410 Traffic Engineering Fundamentals (Ban/Avery)
- **Analytical Methods**
  - CET 513 Transportation Network and Optimization (Ban)
  - CET 521 Inferential Data Analysis for Engineers (Boyle/MacKenzie)
  - CET 587 Global Trade, Management, and Logistics Management (Goodchild)
  - CET 522 Transportation Data Management and Visualization (Wang/Cui)
  - CET 593 Transportation Network Analysis (Ban)

**Exam Grading:** Each question will be graded with a score between 1 and 5, where 1 is the lowest and 5 is the highest. *Passing* the exam requires that each question must be no less than 3.0 out of 5.0 and the mean must be no less than 3.5. There are several possible outcomes if a student does not pass the exam:

First Attempt

- *Conditional Pass:* A student who earned an average score of 3.5 or higher but a score of less than 3.0 on no more than one question, is considered as conditional pass. The student must take one of the three options to pass the exam: (i) retake the exam question in that particular subject area from the same faculty member; (ii) take a particular course in the subject area and the GPA must be 3.5 or higher; and (iii) take an oral exam. The committee will decide which option is the most appropriate for the student to pursue to satisfy his/her qualifying exam requirement in this case. If this option cannot be satisfied, the student will be considered as *failing* the qualifying exam for the first attempt.
- *Retake:* A student who did not pass the exam on the first attempt and did not satisfy the conditional pass may take the exam for a second time the following year.

Second Attempt

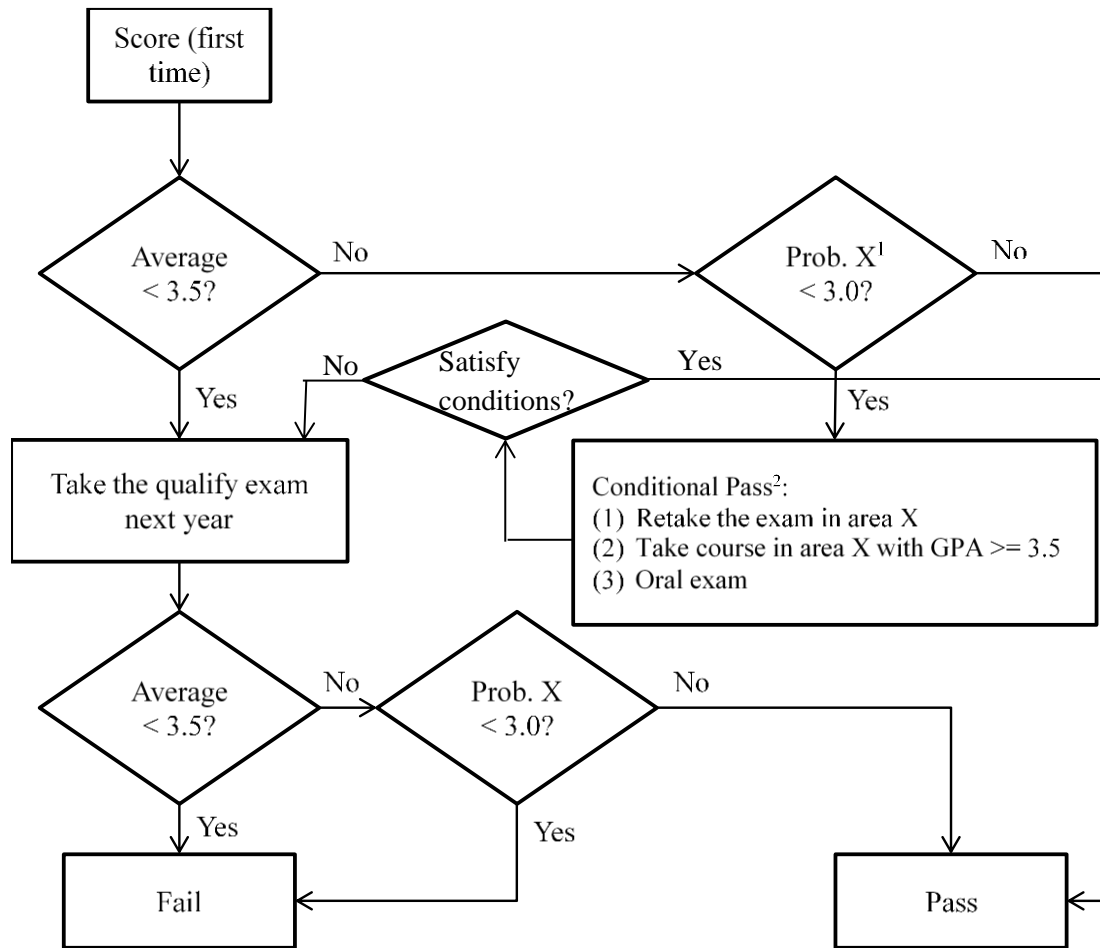
- *Fail:* A student who did not pass the exam the second time will be considered as failing the qualifying exam and will not be permitted to continue in the PhD program.

The following flow chart shows the qualify exam outcomes.

**Exam Administration and Past Exams:** Students can access the questions of an example past exam. Students wishing to do so can request the example exam from the qualifying exam coordinator.

**Notification and record keeping:** After the examination, the chair of the qualifying exam committee of a student will notify the student of the exam decision and will forward the decision to the Graduate Student Advisor of CEE for retention in the student's permanent file.

**Appeals and Grievances:** Any challenge to the decision of the Qualifying Exam Committee should be taken directly to the Graduate Program Coordinator of the Transportation Program. If a formal appeal is made, a new committee of transportation faculty including the student's assigned advisor shall review the student's permanent file, qualifying exam, record of decision and interview the student and make a recommendation to either (1) let the decision stand, or (2) retake the qualifying exam.



Notes:

1: X is a subject area

2: The committee in consultation with the faculty advisor of the student will decide which option is the most appropriate for the student. The student will be considered as failing the qualify exam if the specific option cannot be performed satisfactorily.