

This workshop is intended for technicians and engineers who understand and are experienced with the basic principles and procedures of asphalt concrete mixture design, testing, and voids analysis calculations. Applicants must be PennDOT Certified Level 1 Plant Technicians to attend, or equivalent for out of state participants. This workshop fulfills the volumetric mix design requirements for PENNDOT Level 2 Plant Technician certification. Classroom segments are included to familiarize participants with the Superpave system, along with 1-1/2 days of hands on laboratory testing to evaluate a proposed Superpave mixture design. The Superpave Workshop session consists of two ½-day blocks bracketing 2 full days. This workshop has been updated to reflect the latest changes in test procedures, specifications, and implementation information. Time required for the various sections may vary as needed.

The participants should accomplish the following towards successful completion of the course based on the 75 percent passing grade:

- Conduct laboratory tests as required by the course in a proper manner (20 percent of the grade) – **Minimum required score for laboratory performance to pass the course: 75 percent**
- Prepare a simple report on the Superpave mix design prepared (20 percent of the grade) – See participant’s reporting document below. – **Minimum required score for mix design report to pass the course: 75 percent**
- Pass a written exam (60 percent of the grade) – **Minimum required score for written exam: 75 percent**

**Overall minimum required score to pass the course: 75 percent**

### **Participant’s Reporting Document**

The brief report includes two pages with test result forms attached and must be submitted on the last day of the course and should include the following.

1. The Results of the Volumetric Calculations
2. Bulk and Apparent Specific Gravities of the Combined Aggregate
3. Effective Specific Gravity of the Aggregate
4. Maximum Theoretical Specific Gravity of the Mix
5. Bulk Specific Gravity of the Compacted Mixes
6. Percent Air Voids for the Compacted Mixes
7. Voids in the Mineral Aggregate (VMA)
8. Voids Filled with Asphalt (VFA)
9. Percent Density at  $N_{design}$
10. Dust/AC Ratio (Ratio of Fines to Effective Asphalt)
11. The Estimated Binder Content (i.e., the binder content giving design air voids content)
12. Volumetrics at the Estimated Binder content
13. Compaction Chart (percent density versus gyrations) for the Compacted Mix
14. Gradation Chart for the Aggregates Used

The formulas for calculation of volumetrics will be provided as part of the course material.

The forms required for data recording and plotting compaction charts will be provided as part of the course material.



**SUPERPAVE VOLUMETRIC MIX DESIGN WORKSHOP**

**COURSE AGENDA**

**DAY 1, Tuesday Afternoon  
LECTURE MODULE 1,  
LTI – Research Building B**

| Time*            | Topic  |
|------------------|--|
| 1:00 – 1:20 p.m. | Orientation & Introduction to the Course (Room B107)             |
| 1:20 – 1:40 p.m. | Safety in the Laboratory (Room B107)                             |
| 1:40 – 2:10 p.m. | Introduction to Superpave & Superpave Implementation (Room B107) |
| 2:10 – 2:30 p.m. | Mix Design Concepts (Room B107)                                  |
| 2:30 – 2:45 p.m. | <b>Break</b>   |
| 2:45 – 3:15 p.m. | Materials Selection – Binder (Room B107)                         |
| 3:15 – 3:55 p.m. | Materials Selection – Aggregate (Room B107)                      |
| 3:55 – 4:30 p.m. | Design Using Superpave Gyratory Compactor (Room B107)            |
| 4:30 p.m.        | Dismissal  |

\*Times allocated for various topics are subject to change

**DAY 2, Wednesday Morning  
LECTURE MODULE 2 AND LABORATORY MODULE 1,  
LTI – Research Buildings B and C**

| Time              | Activity – Group 1  | Activity – Group 2  |
|-------------------|---|---|
| 7:30 – 8:00 a.m.  | Morning refreshments (Room B107)  |   |
| 8:00 – 8:30 a.m.  | Volumetric Requirements in Superpave Design (Room B107)   |   |
| 8:30 – 9:10 a.m.  | Superpave Mixture Design: Step by Step Procedure & Design Example (Room B107)                                   |   |
| 9:10 – 9:20 a.m.  | <b>Break</b>  |   |
| 9:20 – 10:35 a.m. | Weigh & batch aggregates for gyratory compaction of specimens for mixture design & for AASHTO T 283 (Room C101) | Mixing specimens for Volumetric Mix Design (Room C101)  |
| 10:35 a.m. – Noon | Mixing specimens for Volumetric Mix Design (Room C101)  | Weigh & batch aggregates for gyratory compaction of specimens for mixture design & for AASHTO T 283 (Room C101) |
| Noon – 1:00 p.m.  | <b>Lunch at the Penn Stater</b>   |   |



**SUPERPAVE VOLUMETRIC MIX DESIGN WORKSHOP**

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**DAY 2, Wednesday Afternoon**

**LABORATORY MODULE 2: HANDS ON LABORATORY TESTING,  
LTI – Research Building C**

| Time                    | Activity – Group 1   | Activity – Group 2  |
|-------------------------|--|---|
| <b>1:00 – 2:00 p.m.</b> | Conduct Tests for Fine Aggregate Sp. Gr. and Coarse Aggregate Sp. Gr. (Room C102)  | Gyratory compaction of mixture design specimens (Room C101)                       |
| <b>2:00 – 3:00 p.m.</b> | Gyratory compaction of mixture design specimens (Room C101)  | Conduct Tests for Fine Aggregate Sp. Gr. and Coarse Aggregate Sp. Gr. (Room C102) |
| <b>3:00 – 3:10 p.m.</b> | <b>Break</b>   |   |
| <b>3:10 – 5:00 p.m.</b> | Demonstration: Sand Equivalent, Flat & Elongated particles, Coarse Agg. Angularity, and Fine Aggregate Angularity (Room C102). |   |
| <b>5:00 p.m.</b>        | <b>Dismissal</b>   |   |

**DAY 3, Thursday Morning**

**LABORATORY MODULE 3: HANDS ON LABORATORY TESTING,  
LTI – Research Building B and C**

| Time                      | Activity – Group 1  | Activity – Group 2  |
|---------------------------|---|---|
| <b>8:00 – 8:15 a.m.</b>   | Orientation for Thursday Work<br>with Morning Refreshments (Room B107)                |   |
| <b>8:15 – 9:15 a.m.</b>   | Discussion of Moisture Damage, AASHTO T 283 and Design Calculations (Room B107)       | Measure bulk density of compacted specimens & Gmm for Volumetric Design (Room C111) |
| <b>9:15 – 10:15 a.m.</b>  | Measure bulk density of compacted specimens & Gmm for Volumetric Design (Room C111)   | Discussion of Moisture Damage, AASHTO T 283 and Design Calculations (Room B107)     |
| <b>10:15 – 10:30 a.m.</b> | <b>Break</b>  |   |
| <b>10:30 a.m. – Noon</b>  | Bulk density and degree of saturation of AASHTO T 283 compacted specimens (Room C111) |   |
| <b>Noon – 1:00 p.m.</b>   | <b>Lunch in Research Building B</b>   |   |



**SUPERPAVE VOLUMETRIC MIX DESIGN WORKSHOP**

**DAY 3, Thursday Afternoon**

**LABORATORY MODULE 4 – LECTURE MODULE 3: ANALYSIS AND CALCULATIONS,  
LTI – Research Building B and C**

| Time                    | Activity – Group 1   | Activity – Group 2 |
|-------------------------|--|--------------------|
| <b>1:00 – 1:40 p.m.</b> | Conduct Indirect Tensile Tests on Conditioned and Dry Specimens for AASHTO T 283 (Room C103)                 |                    |
| <b>1:40 – 2:15 p.m.</b> | Review of the Rotational Viscometer, Superpave Shear Tester, and Indirect Tensile Tester (Rooms C102 & C111) |                    |
| <b>2:15 – 2:30 p.m.</b> | <b>Break</b>   |                    |
| <b>2:30 – 5:00 p.m.</b> | Conduct Calculations, Analysis, and Report Preparation (Room B107)   |                    |
| <b>5:00 p.m.</b>        | <b>Dismissal</b>   |                    |

**DAY 4, Friday Morning  
LECTURE MODULE 4,  
LTI – Research Building B**

| Time                      | Topic  |
|---------------------------|--|
| <b>8:00 – 9:00 a.m.</b>   | Report Submission and Data Analysis (Room B107)                                      |
| <b>9:00 – 10:00 a.m.</b>  | Course Exam (Room B107)  |
| <b>10:00 – 10:15 a.m.</b> | <b>Break</b>   |
| <b>10:15 – 11:15 a.m.</b> | Exam review, question & answer period, course evaluation by participants (Room B107) |
| <b>11:15 a.m.</b>         | <b>Dismissal</b>   |

**NOTES:**

- Times shown for all activities are approximate & may be varied as needed.
- Lunch will be provided for all course participants during the 2 full day sessions as indicated on this schedule. Refreshments will be provided each morning.
- Parking passes for privately owned vehicles are available upon request to prevent ticketing by University police – these are for specific lots located only at PTI.
- You will need a calculator & pen/pencil to use in the laboratory and for the exam.
- Long pants and closed toe shoes are required for testing activities in the laboratory – please dress appropriately for working with mechanical equipment and hot materials. Safety glasses and gloves will be provided.
- Participants are responsible for their own hotel accommodations. A list of local hotels including telephone numbers is available upon request. It is not always possible for NECEPT to arrange for discounted room rates for workshop attendees, but be sure to ask if such rates are available when making your hotel arrangements.