Highway Construction Materials Technician (HCMT) Program

Course Catalog

The Oklahoma Highway Construction Material Technician Program provides specialized training and certification for technicians and inspectors responsible for ensuring the quality and compliance of highway construction projects. Courses combine classroom instruction, specification review, laboratory concepts, and field inspection practices to develop the competencies necessary for construction quality assurance and acceptance. The program supports consistent inspection practices and promotes the construction of safe, durable, and high-performing transportation infrastructure throughout the state of Oklahoma.

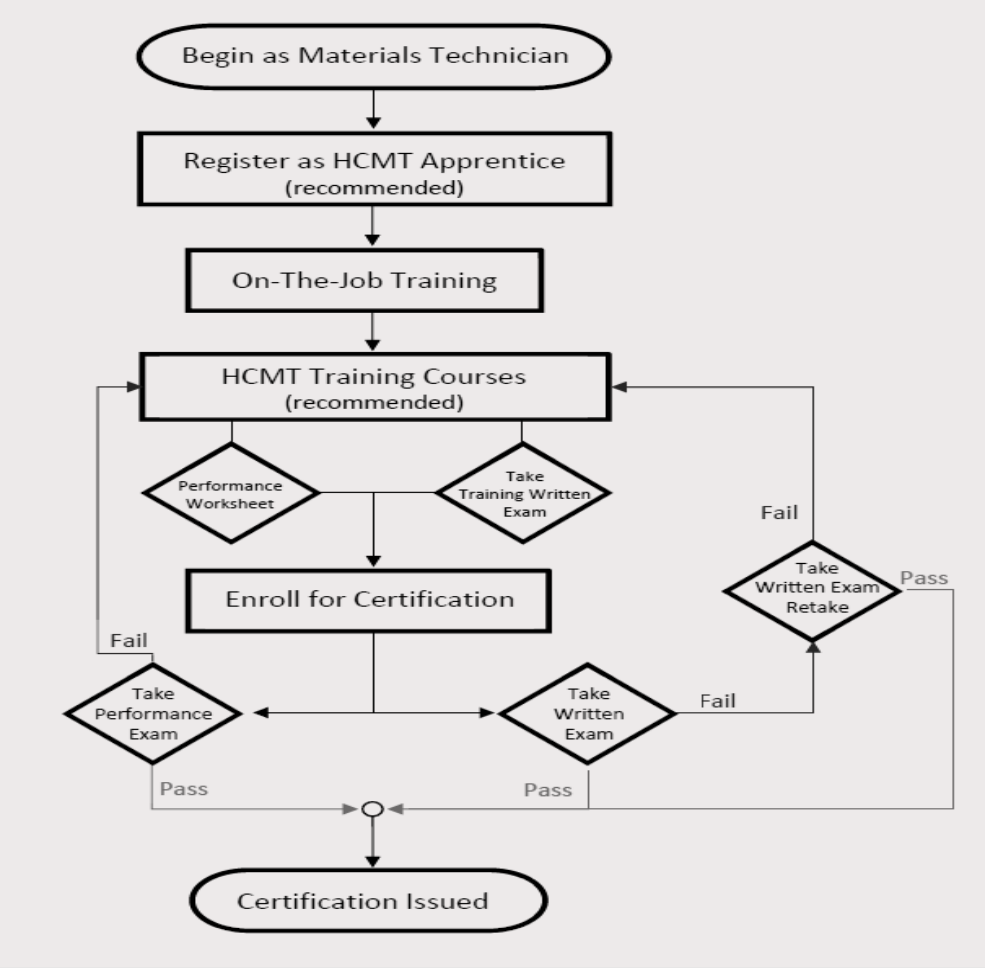

Table of Contents

Aggregates Materials Training

Description: This course provides instruction in the sampling and testing of aggregates in accordance with HCMT certification requirements. Topics include sampling, splitting, moisture content, wash loss (#200 sieve), and sieve analysis for fine and coarse aggregates. Additional instruction includes chip seal wash loss procedures (OHDL 48), aggregate properties, production, and Oklahoma DOT specifications. Participants complete required calculations and hands-on laboratory testing.

Standards: AASHTO R 90; AASHTO T 11; AASHTO T 27; AASHTO T 76; AASHTO T 255; OHD L 48

Training format: Classroom and Laboratory

Assessment: Written examination and performance examinations

Prerequisites: none

Duration: 3 Days

Learning Objectives / Competencies

Upon completion, participants will be able to:

- Explain aggregate production processes, properties, and performance characteristics
- Interpret applicable AASHTO, ASTM, ODOT, and OHDL standards
- Perform sampling and splitting procedures for fine and coarse aggregates
- Determine and calculate moisture content and wash loss (#200 sieve)
- Conduct sieve analysis and interpret gradation results
- Perform chip seal wash loss testing (OHDL 48)
- Complete required calculations in accordance with certification standards

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Dan Cook; Remington Butler

Aggregates Certification

Description: This certification includes sampling, splitting, moisture content, wash loss passing the #200 sieve, and sieve analysis for both coarse aggregate and fine aggregate. Also, this certification includes the wash loss passing the #200 of a chip seal using OHDL 48. Hand calculations from participants will also be required.

Standards: AASHTO R 90; AASHTO T 11; AASHTO T 27; AASHTO T 76; AASHTO T 255; OHD L 48

Key Elements: CLICK HERE FOR KEY ELEMENTS
Format: Classroom and Laboratory

Assessment: Written examination and performance examinations

Prerequisites: None

Duration: 2 Days

Learning Outcomes / Competencies

Participants will demonstrate the ability to:

- Accurately perform aggregate sampling and splitting procedures
- Conduct moisture, wash loss, and sieve analyses to standard requirements
- Perform chip seal wash loss testing
- Complete and verify required calculations
- Apply testing procedures in compliance with certification standards

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Dan Cook; Brandon Reinhardt; Barrington Smith;

Asphalt Materials Training

Description: This course covers sampling and testing of asphalt materials in alignment with HCMT Asphalt certification. Topics include HMA and liquid asphalt sampling, density testing, binder content, gradation analysis, specific gravity, compaction (Superpave), and performance testing (IDEAL-CT). Emphasis is placed on Oklahoma DOT specifications and laboratory procedures.

Standards: AASHTO T 30; AASHTO R 67; AASHTO R 97; AASHTO T 166; AASHTO T 176 (part 1 & 2); AASHTO T 209; AASHTO T 312; AASHTO R 47; OHD L 5; OHD L 14 (method 2); OHD L 26 (part 1 & 2); OHD L 45; OHD L 65; ASTM D8225

Training format: Classroom and laboratory

Assessment: Written examination and performance examinations

Prerequisites: None

Duration: 5 Days

Learning Outcomes / Competencies

Participants will be able to:

- Describe asphalt production, placement, and material behavior
- Interpret AASHTO, ASTM, and ODOT standards
- Perform sampling of HMA and liquid asphalt
- Conduct density testing using nuclear gauge methods
- Determine binder content using ignition oven procedures
- Perform sieve analysis, Rice test, and sand equivalent testing
- Compact specimens using a Superpave gyratory compactor
- Determine specific gravity and unit weight using vacuum sealing methods
- Conduct IDEAL-CT testing and interpret results

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Cynthia Lynn

Asphalt Certification

Description: This certification evaluates competency in asphalt sampling, testing, and analysis procedures used for quality control and acceptance testing.

Standards: AASHTO T 30; AASHTO R 67; AASHTO R 97; AASHTO T 166; AASHTO T 176 (part 1 & 2); AASHTO T 209; AASHTO T 312; AASHTO R 47; OHD L 5; OHD L 14 (method 2); OHD L 26 (part 1 & 2); OHD L 45; OHD L 65; ASTM D8225

Key Elements: CLICK HERE FOR KEY ELEMENTS
Format: Classroom and laboratory

Assessment: Written examination and performance examinations

Prerequisites: None

Duration: 3 Days

Learning Outcomes / Competencies

Participants will demonstrate the ability to:

- Perform HMA and liquid asphalt sampling
- Conduct density, binder content, and gradation testing
- Determine maximum specific gravity and sand equivalent values
- Compact specimens using Superpave methods
- Perform and calculate results for all required asphalt tests
- Apply testing procedures according to certification requirements

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Brandon Reinhardt; Barrington Smith;

Asphalt Mix Design Level I Training & Certification

Description: This course provides training and certification in asphalt mix design fundamentals, including aggregate properties, moisture susceptibility, permeability, and mix design specifications required by Oklahoma DOT.

Standards: AASHTO T 84, AASHTO T 85, AASHTO T 304, AASHTO T 283, ASTM D 4791, OHD L-44

Prerequisites: Current Asphalt and Aggregates Certification

Training format: Classroom and laboratory

Assessment: Written and performance examinations

Duration: 2 Days

Learning Outcomes / Competencies

Participants will be able to:

- Interpret asphalt mix design specifications and requirements
- Perform tests for aggregate specific gravity, angularity, and particle characteristics
- Evaluate moisture susceptibility and permeability
- Apply ASTM, AASHTO, and ODOT standards in mix design procedures
- Conduct required testing to support mix design submission

Who should attend? Mixture design specialist, laboratory manager, materials technicians

Instructor Information

Danny Gierhart & David Vivanco

Asphalt Mix Design II Training & Certification

Description: This course focuses on advanced asphalt mix design using Superpave volumetric principles, including evaluation, quality control, troubleshooting, and documentation for ODOT approval.

Standards: Variety of ASTM, AASHTO, and ODOT specifications

Prerequisites: Current Aggregates, Asphalt, Asphalt Mix Design Level 1 Certification

Assessment: Written examinations only

Duration: 2 Days

Learning Outcomes / Competencies

Participants will be able to:

- Evaluate asphalt mix designs for compliance with specifications
- Apply Superpave volumetric calculations and concepts
- Analyze quality control data and troubleshoot mixture issues
- Prepare and submit mix design documentation to ODOT
- Interpret relevant AASHTO, ASTM, and ODOT standards

Who should attend? Mixture design specialist, laboratory manager, materials technicians

Instructor Information

Danny Gierhart & David Vivanco

Concrete Materials Training

Description: This course provides instruction in sampling and testing fresh and hardened concrete in accordance with HCMT certification requirements. Topics include temperature, slump, air content, unit weight, specimen fabrication, curing, and compressive strength testing. Emphasis is placed on laboratory procedures, calculations, and Oklahoma DOT specifications.

Standards: AASHTO R 60; AASHTO T 22; AASHTO R 100; AASHTO T 119; AASHTO T 121; AASHTO T 152; AASHTO T 196; AASHTO T 309

Training format: Classroom and laboratory

Assessment: Written examination and performance examinations

Prerequisites: None

Duration: 2 Days

Learning Outcomes / Competencies

Participants will be able to:

- Explain concrete materials, production, and performance characteristics
- Interpret applicable AASHTO, ASTM, and ODOT standards
- Perform sampling of fresh concrete from various placement conditions

- Conduct slump, temperature, air content, and unit weight tests
- Calculate yield, relative yield, and cementitious content
- Fabricate and cure strength specimens
- Perform compressive strength testing and associated calculations
- Calibrate and operate air content testing equipment

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Dan Cook; Remington Butler

Concrete Certification

Description: This certification validates participant competency in sampling and testing procedures for fresh and hardened concrete, including field testing, specimen preparation, and strength evaluation.

Standards: AASHTO R 60; AASHTO T 22; AASHTO R 100; AASHTO T 119; AASHTO T 121; AASHTO T 152; AASHTO T 196; AASHTO T 309

Key Elements: CLICK HERE FOR KEY ELEMENTS
Format: Classroom and laboratory

Assessment: Written and performance examinations

Prerequisites: None

Duration: 1 Days

Learning Outcomes / Competencies

Participants will demonstrate the ability to:

- Perform proper sampling of fresh concrete
- Conduct slump, temperature, air content, and unit weight testing
- Calculate yield and cementitious content
- Fabricate and cure test specimens
- Perform compressive strength testing and interpret results
- Calibrate and operate testing equipment in accordance with standards

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Dan Cook; Brandon Reinhardt;

Materials Sampling & Testing Training

Description - This course provides comprehensive training in sampling and testing of aggregates, asphalt, concrete, and soils in accordance with HCMT Material Sampler certification requirements. Topics include random sampling procedures, in-place density testing, asphalt coring, and concrete testing methods. Emphasis is placed on field and laboratory procedures and Oklahoma DOT specifications.

Standards: AASHTO R 60; AASHTO R 90; AASHTO T 22; AASHTO R 100; AASHTO T 119; AASHTO T 121; AASHTO T 152; AASHTO T 196; AASHTO T 309; AASHTO T 310; OHD L 5; OHD L 14; OHD L 65

Training format: Classroom and laboratory

Assessment: Written and performance examinations

Prerequisites: None

Duration: 5 Days

Learning Outcomes / Competencies

Participants will be able to:

- Explain material production processes and performance characteristics
- Apply random sampling procedures and ODOT sampling frequency requirements
- Perform sampling of aggregates, asphalt materials, and fresh concrete
- Conduct field testing of concrete including slump, temperature, air content, and unit weight
- Fabricate, cure, and test concrete strength specimens
- Perform asphalt sampling, coring, and density testing using nuclear gauge methods
- Conduct in-place density and moisture testing of soils
- Interpret AASHTO, ASTM, and ODOT standards

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Dan Cook; Remington Butler; Cynthia Lynn

Materials Sampler Certification

Description: This certification evaluates participant competency in sampling and field testing of aggregates, asphalt, concrete, and soils, including random sampling procedures and in-place testing methods.

Standards: AASHTO R 60; AASHTO R 90; AASHTO T 22; AASHTO R 100; AASHTO T 119; AASHTO T 121; AASHTO T 152; AASHTO T 196; AASHTO T 309; AASHTO T 310; OHD L 5; OHD L 14; OHD L 65

Key Elements: CLICK HERE FOR KEY ELEMENTS
Format: Classroom and laboratory

Assessment: Written and performance examinations

Prerequisites: None

Duration: 3 Days

Learning Outcomes / Competencies

Participants will demonstrate the ability to:

- Perform random sampling procedures in accordance with ODOT requirements
- Conduct sampling of aggregates, asphalt, and concrete materials

- Perform field testing of fresh concrete (slump, temperature, air content, unit weight)
- Fabricate and evaluate concrete test specimens
- Perform asphalt sampling, coring, and density testing
- Conduct in-place density and moisture testing of soils
- Apply testing procedures in compliance with certification standards

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Dan Cook; Brandon Reinhardt; Barrington Smith;

Soil Mechanics Training

Description: This course provides instruction in soil classification, sampling, and laboratory testing procedures in accordance with HCMT Soils certification requirements. Topics include gradation, Atterberg limits, compaction, moisture-density relationships, and field density testing. Emphasis is placed on laboratory procedures, calculations, and Oklahoma DOT specifications.

Standards: AASHTO T 85; AASHTO R 58; AASHTO T 88; AASHTO T 89; AASHTO T 90; AASHTO T 99; AASHTO T 180; AASHTO T 224; AASHTO T 272; AASHTO T 310; AASHTO M 145; ASTM D 2487; ASTM D 1140

Format: Classroom and laboratory

Assessment: Written and performance examinations

Prerequisites: None

Duration: 5 Days

Learning Outcomes / Competencies

Participants will be able to:

- Classify soils and soil-aggregate mixtures using standard systems
- Interpret AASHTO, ASTM, and ODOT standards
- Perform dry preparation and gradation analysis of soil samples
- Conduct washing procedures for material finer than #200 sieve
- Determine and calculate Atterberg limits
- Perform specific gravity and absorption testing
- Conduct in-place density and moisture testing
- Calculate moisture-density relationships using Proctor methods
- Apply corrections for coarse particles in compaction testing

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Jerry Miller; Dr. Amy Cerato

Soils Certification

Description: This certification evaluates participant competency in soil classification, sampling, and testing procedures used in construction quality control and acceptance testing.

Standards: AASHTO T 85; AASHTO R 58; AASHTO T 88; AASHTO T 89; AASHTO T 90; AASHTO T 99; AASHTO T 180; AASHTO T 224; AASHTO T 272; AASHTO T 310; AASHTO M 145; ASTM D 2487; ASTM D 1140

Key Elements: CLICK HERE FOR KEY ELEMENTS
Format: Classroom and laboratory

Assessment: Written and performance examinations

Prerequisites: None

Duration: 2 Days

Learning Outcomes / Competencies

Participance will demonstrate the ability to:

- Classify soils and soil-aggregate mixtures
- Perform sample preparation and gradation testing
- Conduct washing and Atterberg limit tests
- Perform specific gravity and absorption testing
- Conduct in-place density and moisture testing
- Calculate and interpret Proctor compaction results
- Apply testing standards and procedures for certification compliance

Who should attend? Materials technicians, laboratory manager, construction inspectors

Instructor Information

Dr. Jerry Miller; Dr. Amy Cerato

Construction Inspection Training Courses

Asphalt Construction Inspector Course

This course provides the knowledge and field inspection skills necessary to monitor and document asphalt pavement construction activities in accordance with Oklahoma transportation specifications, policies, and accepted industry practices. Participants will learn asphalt mixture production, transportation, placement, compaction, quality control, quality assurance, and acceptance procedures. Emphasis is placed on inspector responsibilities, inspection documentation, density verification, surface characteristics, construction troubleshooting, and safety practices. Upon completion, participants will be able to evaluate asphalt paving operations, identify construction deficiencies, verify specification compliance, and effectively communicate findings to project personnel.

Topics include:

- Asphalt materials and mix design fundamentals
- Plant production and quality control processes

- Paving equipment and operations
- Compaction principles and density acceptance
- Surface smoothness and pavement quality characteristics
- Inspection documentation and reporting
- Construction troubleshooting and corrective actions
- Safety requirements and inspector responsibilities

Bridge Construction Inspector Course

This course prepares inspectors to monitor and document bridge construction activities from foundation installation through final structural completion. Participants will gain an understanding of bridge components, construction sequencing, materials inspection, structural tolerances, and specification compliance. The course emphasizes quality assurance procedures, inspection documentation, safety considerations, and communication practices necessary for successful bridge construction oversight. Upon completion, participants will be able to inspect bridge construction operations, identify non-conforming work, verify compliance with plans and specifications, and maintain accurate project records.

- Topics include:
- Bridge plans, specifications, and contract requirements
- Foundations, piling, and substructure construction
- Reinforcing steel inspection
- Structural concrete placement and curing
- Structural steel fabrication and erection
- Bearings, joints, and drainage systems
- Quality assurance and acceptance procedures
- Documentation, safety, and construction records

Earthwork Inspector Course

This course provides inspectors with the knowledge and practical skills needed to evaluate earthwork operations associated with highway construction projects. Participants will learn soil classification, moisture-density relationships, excavation and embankment construction, compaction requirements, and field-testing procedures. Emphasis is placed on inspection techniques, specification compliance, documentation, and identification of common earthwork problems. Upon completion, participants will be able to inspect grading operations, verify compaction requirements, interpret test results, and ensure earthwork activities meet project specifications.

- Topics include:
- Soil properties and classification systems
- Excavation and embankment construction methods
- Moisture control and compaction principles
- Density testing and acceptance criteria
- Subgrade preparation and stabilization
- Drainage considerations and erosion control
- Earthwork inspection procedures
- Documentation and quality assurance requirements

Portland Cement Concrete Pavement Inspector Course

This course provides the technical knowledge and field inspection skills required to oversee the construction of Portland cement concrete pavement projects. Participants will study concrete materials, batching operations, placement methods, finishing techniques, curing requirements, joint construction, and pavement acceptance criteria. The course emphasizes inspector responsibilities, quality assurance procedures, troubleshooting, and documentation necessary to ensure durable and compliant pavement construction. Upon completion, participants will be able to evaluate concrete paving operations, verify specification compliance, identify construction deficiencies, and document project activities accurately.

- Topics include:
- Concrete materials and mixture fundamentals
- Batching, transportation, and placement operations
- Slip-form and fixed-form paving methods
- Consolidation, finishing, and texturing techniques
- Curing practices and strength development
- Joint construction and load transfer systems
- Pavement quality characteristics and acceptance
- Inspection documentation and quality assurance procedures

Program Polices and General Information

Expectations and Requirements

1. Participants must attend all sessions to receive a completion certificate or CEUs.
2. Active engagement in discussions and hands-on exercises is expected
3. Passing scores on both written and practical examinations prescribed by HCMT.
4. [If online] Participants should have a stable internet connection, microphone, and webcam.

Registration Information

Cancellations / Substitutions / Credits: Cancellations may be made up to 10 business days before the course start date. Participants who cancel within this window can send a substitute or request a refund or credit. Credits may be applied toward the next available session and are valid for one year from the original registration date.

Participants who cancel after the 10-business-day deadline are not eligible for a refund.

In the event of a class cancellation due to extenuating circumstances, OSU will not be responsible for any cancellation fees incurred by participants, including charges from airlines, hotels, or conference venues.

For in-person events, refunds will be processed after registration closes and will incur a 25% processing fee. Refunds may take up to 30 days to process. Cancellations received after the 10-business-day deadline are not eligible for a refund.

For online offerings, refunds will only be issued if the registrant is unable to access the course due to technical issues that cannot be resolved by the registrant or CEAT Professional Development's technical support team.

Accessibility and Accommodations

CEAT Professional Development is committed to providing accessible learning experiences. Please contact CEAT Professional Development at ceatprodev@okstate.edu or 405-744-5714 prior to the course start date to discuss accommodation needs.

FERPA

In accordance with the Family Educational Rights and Privacy Act (FERPA), learner education records are not released to third parties without the learner's prior written consent, except as permitted by law.

Anti-Discrimination Policy

Oklahoma State University, as an equal opportunity employer, complies with all applicable federal and state laws regarding non-discrimination. Oklahoma State University is committed to a policy of equal opportunity for all individuals and does not discriminate based on race, religion, age, sex, color, national origin, marital status, disability, or veteran status with regard to employment, educational programs and activities, and/or admissions. For more information, visit the university's Equal Opportunity website.

Grading Policy

This is a pass or fail course. A minimum of 70% is needed on the all sections and an average overall of 80% to pass the written examination of a course. For the performance examination, a passing score shall consist of successful completion of a series of sampling and testing procedures.

a) Applicants failing to achieve a passing score on the written examination may retake the examinations one (1) time within sixty (60) days after notification of the failing score. Applicants failing to achieve a passing score on the subsequent written examination shall not be considered for certification until re-satisfying all certification requirements.
b) Applicants failing to achieve a passing score on any procedure in the practical examination will be given one opportunity to re-attempt that procedure between seven (7) and sixty (60) days after the notification of failing. Applicants failing to pass the procedure on the subsequent attempt shall not be considered for certification until re-satisfying all certification requirements.

Certificate of Completion and Certifications

To receive the certificate of complete or a certification after you have completed the course, contact CEAT Professional Development at ceatprodev@okstate.edu and provide your name and the name of the module you have completed. CEAT Professional Development will verify satisfactory completion and issue your certificate. Certification shall be effective for a period of five (5) consecutive years or until a re-certification attempt is failed unless otherwise revoked or suspended.