

NAFTC Curriculum Development Process Overview

The National Alternative Fuels Training Consortium (NAFTC) has extensive experience in the development of alternative fuel and advanced technology vehicle workshops and courses, for classroom and online environments. This includes the design and development of technical and non-technical instructor/teacher and student manuals; technical and non-technical tools; teaching tools; and training aids. Presently offering over 25 courses and workshops on all types of alternative fuel and advanced technology vehicles, the NAFTC has curricula and materials for multiple audiences.

The NAFTC utilizes a curriculum development process that has been refined and perfected since the NAFTC was established in 1992, and has won numerous awards and industry endorsements.

This process includes working to define the course's purpose; scope; objectives; and expectations. The NAFTC uses the information garnered from this process to compose objectives; create topical and detailed outlines; and to research and create course content. Following the development of these initial documents, the NAFTC develops curriculum materials for use with the instructor's manual, including presentations; lesson plans; practical exercises; learning activities; and module review questions.

After the first drafts of the instructor and participant manuals have been developed, they undergo an internal (alpha) review by a team, including a curriculum developer; instructional designer; subject matter experts; NAFTC National Training Center representatives; industry representatives; and the NAFTC Assistant Director-Curriculum and Training. This alpha review team evaluates the curriculum for content, technical accuracy, and other issues, and provides feedback and suggested changes. These changes are incorporated into the curriculum, and a second draft of the instructor and participant manuals are developed for beta testing.

The beta test is conducted after the revision of the curriculum based upon the alpha review. During the beta test, the curriculum is presented to an audience of instructors, sample participants, curriculum developers, and industry representatives. Feedback from this beta test is gathered via evaluation forms; problem report forms; and comments from the audience and instructors. The data, feedback, and comments are then used to make further revisions and the final draft of the instructor and participant manuals is created for widespread dissemination.

This process has resulted in training development projects for the U.S.

Environmental Protection Agency in natural gas vehicles, propane vehicles, emissions testing and an overview of all of the alternative fuels. It is the process used to produce the award-winning curricula in the Clean Cities Learning Program, funded by the U.S. Department of Energy Clean Cities Program and the Advanced Electric Drive Vehicle Education Program, funded by the Energy Efficiency and Renewable Energy Office of the U.S. Department of Energy.

All curriculum development projects are developed under the leadership and oversight of the NAFTC's management team of William A. Davis, Acting Director; Micheal Smyth, Assistant Director-Curriculum and Training; and Judy Moore, Assistant Director-Communications and Outreach; who have more than 50 years of combined experience in the development and delivery of technical curricula on a variety of subjects, including extensive experience with the design, development, and delivery of alternative fuels and alternative fuel and advanced technology vehicles.

NAFTC Curriculum Development Phases

This NAFTC curriculum development process consists of six phases (planning, analysis, design, development, implementation, and evaluation) that follow generally-accepted practices of curriculum development and instructional systems design.

Phase 1: Planning

During the Planning Phase, the NAFTC develops a course proposal; conducts a needs assessment; defines the target audience; and establishes the course's goals, structure, and a preliminary course outline. Once this course proposal has been established and the needs assessment has been completed, the NAFTC creates a development plan that guides the curriculum development process.

Phase 2: Analysis

The Analysis Phase defines tasks that are associated with the curriculum, including consultations with subject matter experts and the development of a written job task analysis. This job task analysis includes a detailed project plan with that defines the phases, tasks, and anticipated start and end dates for each. This detailed project plan will serve as a working timeline to guide the efforts of the NAFTC's curriculum development team.

Phase 3: Design

The course outline, objectives, and measurements are more-fully developed during

the Design Phase. After a draft course outline has been developed, it is submitted to multiple reviewers, including members of the NAFTC management and curriculum development teams and subject matter experts for review and feedback. Once this design review is completed and a final draft of the course outline is developed and approved, the NAFTC curriculum development team develops course objectives and measurements for each topic, module, and lesson.

Phase 4: Development

After the Design Phase is completed, the NAFTC curriculum development team begins developing the course in earnest. This task includes the creation of draft instructor's and student manuals; an inventory of the learning activities and source materials; and graphics and videos to support the curriculum.

Phase 5: Implementation

Once the draft course curricula is completed, it undergoes a thorough review process with an internal (alpha) review by the NAFTC Assistant Director-Curriculum Development and Training, NAFTC National Trainer, NAFTC Acting Director, and other members of the NAFTC Headquarters staff. The alpha review team evaluates the curricula for content, technical accuracy, and other issues, and provides suggested changes. These changes are incorporated into the curricula and a second draft is developed for external (beta) testing.

During the beta review, the curriculum is reviewed by and presented to an audience of instructors, sample participants, and developers. Feedback from the beta review is gathered via evaluation forms, problem report forms, and comments from the audience and NAFTC National training Center instructors. The data, feedback, and comments from the beta test are then incorporated into a final copy to the course curriculum for widespread distribution.

Phase 6: Evaluation

Once the course curriculum is completed, the NAFTC conducts a review of the entire curriculum development process; compiles course evaluations from students and Instructor Feedback Forms; and begins planning for future course enhancements and revisions based upon ongoing feedback as the course is offered.