

## Technology Overview

### Module Perspective

1. What is the topic?
  2. Who is (are) the audience(s)?
  3. What is the course goal?
  4. What are the learning objectives?
  5. What are you trying to cover?
  6. How do you plan to do this?
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1. The topic for this course module is a review of all the technologies applicable to decentralized wastewater treatment and dispersal systems. The module content is intended to introduce students to the various technologies used and prepare them for more in-depth study using other modules in this curriculum.
  2. The materials in this module can be used for a variety of audiences:
    - a. The primary audience is all public/private sector members of the on-site wastewater industry – especially those relatively new to the industry. This includes site evaluators, soil scientists, designers, engineers, consultants, installers, pumpers, monitoring & maintenance personnel, and environmental health specialists and other regulatory personnel. This course can be adapted relatively easily to entry-level personnel.
    - b. Secondary audiences include all interested parties (systems owners/users, local board of health members, politicians, real estate/lending institution personnel, others). The course materials may need some simplification for this audience.
    - c. While this module has been developed specifically for practitioner training, it can also be used as an introduction to technologies for students in environmental science or engineering and/or public health students in colleges and universities
  3. The simple, overriding goal of this course is to provide a general understanding of the various on-site wastewater treatment and dispersal technologies used primarily for small daily wastewater flows from facilities producing wastewater quality similar to that expected from residential development. These flows will be from residences, single-family and clusters of homes, and commercial development.
  4. After participating in this module:
    - a. Participants will be able to identify and describe the different wastewater treatment and dispersal technologies available using consistent terminology.
    - b. Students can compare the technologies with regards to general concepts, function, regulatory requirements; site and location requirements; treatment efficiencies; esthetics and economic parameters; and design, installation and monitoring/maintenance needs.
    - c. Industry professionals will make better basic decisions related to their understanding of wastewater technologies and will know where to go for more in-depth information, particularly what other modules in the curriculum are available.
  5. Topics included in this module include:
    - a. Background information on what information is needed in order to select appropriate technologies for a specific site.
    - b. Different treatment methodologies that are used by the technologies
    - c. Information on each of the technologies used in decentralized wastewater

- treatment and dispersal systems
6. There are a wide variety of ways the materials in this module can be used. This depends on the specific audience, the availability of a demonstration site or hands-on equipment, and the desired outcomes of the course.
    - a. Instructional aids
      - 1) Handout for class participants. The handout is in outline format. It can relatively easily be changed to a “fact sheet” format with each “fact sheet” containing general information each technology. A glossary of terms is available that can be included as part of the handout.
      - 2) Instructor materials – syllabus, PowerPoint presentation, instructor notes included with the PowerPoint presentation
      - 3) A catalog of pictures and diagrams of the technologies. These pictures will be from a variety of sources and individuals throughout the United States and Canada.
    - b. Potential methods of delivery
      - 1) Classroom instruction consisting primarily of lecture and discussion. Quizzes, case studies, or other instruction mechanisms can be developed to assist the instructor. The use of “hands-on” equipment and/or visits to a demonstration site is recommended if they are available. Sufficient time must be provided for questions and answers, comments on how the technologies are used locally, different terminology that is used locally, etc.
      - 2) A variety of options for instructing a class using these and other materials are available. The time needed for a class will depend on whether an adjacent or nearby demonstration site displaying the technologies is available and on the level of detail the instructor chooses to provide. The following options range from a brief, general overview course to much more in-depth course or part of a semester/quarter class at a college or university.
        - a) Option 1: A one-day, general overview class with 7-8 contact hours. Some detail in the handout and PowerPoint presentation will have to be omitted. There will be little time for class discussion and questions, as well as for using “hands-on” displays. This option may be more appropriate for interested parties who are not employed in the on-site wastewater industry or for a quick overview class, especially for individuals new to the on-site wastewater industry.
        - b) Option 2: Two days @ 7-8 contact hours per day if **all** the material is to be presented. This option provides ample opportunity for participant involvement, which is mandatory to maximize the learning. Participants must be able to ask questions, make comments, and discuss how they apply the technologies in their jurisdictions and other differences from what’s presented in the course. The syllabus provided in this instructor packet assumes this option.
          - i. If a demonstration site is available, this can add another day or more to the class, with time spent looking at actual components and systems.
          - ii. The instructor can add more detail from other training modules developed on specific technologies. Modules are available both

from the practitioner and university modules. This may extend the class beyond two days. The outline for this module, contained later in this instructor packet, contains specific references to the other practitioner and university modules that are available.

- iii. This can be broken into shorter modules – for example, over several 1-2 hour staff meetings or several evening/weekend sessions
- c) Option 3: Using the information in this module, as well as detail in other practitioner and university modules, this topic can provide a quarter/semester long class for upper level college/university environmental engineering, environmental science, or public health students consisting of up to 48 or more contact hours. Alternatively, where a college or university only offers a one-quarter/semester class on on-site wastewater, this module, together with information from other modules, can provide the content for the technology portion of the class.