

Course Description**HOS2005 | Hydroponic Systems | 3.00 credits**

This course will provide an overview of the different types of hydroponic systems. Students will learn about set-up requirements, maintenance, nutrient formulations, and growing plants in a soilless culture. The course will emphasize the knowledge and skills required to run small hydroponic systems. (lecture).

Course Competencies:

Competency 1: The student will be able to define the characteristics of hydroponic growing and its applications by:

1. Defining hydroponic growing compared to different growing practices, including soilless growing, protected agriculture, and field production
2. Describing the history of hydroponics
3. Identifying the advantages and disadvantages of hydroponic systems
4. Discussing applications of hydroponic systems in industry, including crops commonly produced using hydroponic methods

Competency 2: The student will be able to describe plant production principles specifically relating to hydroponic production by:

1. Recognizing water as the primary component of hydroponic systems
2. Defining cultural requirements is key for hydroponic production, including light, nutrients, dissolved oxygen, and the greenhouse environment
3. Exploring various ways hydroponic crops are placed in a greenhouse, including plant supports, wires, floats, etc.
4. Listing different substrate materials and explain the advantages and disadvantages of each
5. Diagramming an example hydroponic setup and labeling the system components

Competency 3: The student will be able to define different types of hydroponic systems and their components by:

1. Diagramming an example hydroponic setup and labeling the system components
2. Defining substrate systems and exploring examples of substrate systems
3. Defining aggregate systems and exploring examples of aggregate systems

Competency 4: The student will understand how water quality impacts hydroponic systems by:

1. Examining how pH, alkalinity, and EC (electrical conductivity) affect water quality
2. Examining how biotic factors impact water quality and hydroponic system functions
3. Taking water and preparing water samples for testing
4. Interpreting water sample results

Competency 5: The student will understand nutrient solutions for hydroponic crops by:

1. Defining solution, concentration, and parts per million
2. Learning how to interpret crop nutritional requirements recommendations
3. Interpreting labels for hydroponic nutrient mixes
4. Discussing systems that use fertilizer injectors

Competency 6: The student will set up and run a simple hydroponic system by:

1. Applying knowledge to create a simple hydroponic system
2. Calculating amounts and mixing hydroponic fertilizers following directions
3. Running and troubleshooting the system

Learning Outcomes:

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Describe how natural systems function and recognize the impact of humans on the environment