

**Course:**                **A Sustainable and Practical Approach to Hydroponic Food Production Utilizing Solar Technology**

**Contact Hours:**    **24**

**Pre-requisite:**        **None**

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## **Description**

A Sustainable and Practical Approach to Hydroponic Food Production Utilizing Solar Technology is designed to provide the necessary teaching content to ensure that all participants gain the basic knowledge, science and confidence to construct their own hydroponic system.

Hydroponic farming utilizing solar energy is one form of Climate Smart Agriculture Practices geared toward maximizing food production, whilst ensuring the safety and protection of the environment. Tropical climates have an abundance of sunlight that can convert into solar energy. This energy can be stored and utilized to operate energy-dependent production systems, like Hydroponic Farming. Rural Agriculture areas that are restricted to traditional farming practices can now fully mechanize their production systems, increase revenue and adopt commercial food safety quality standards.

Hydroponic farming offers a pathway towards a more sustainable food ethic which prioritizes the health of our food, bodies and environment without the heavy use of chemicals. It also promotes the growth of healthier crops in an intensive system. This type of farming is modern and would improve our food production systems.

## **Target Audience**

- Individuals that are interested in hydroponic, growing healthier crops, healthy food.
- Home growers and small business start-ups.

## **Learning outcomes**

Upon completion of this course, learners will be able to:

- To understand the principles of plant health
- To understand plant fertility and fertilizer blends
- To have a general understanding of the different types of hydroponic systems
- To apply the teaching content to construct any hydroponic system
- To understand the scientific engineering application of solar energy
- To apply sustainable renewable energy solar technology.

## **Course Content**

### **Session 1 – Introduction**

- Definitions and terminologies
- Introduction to hydroponic science and requirements
- Basic home systems set-up

### **Session 2 - Types of Hydroponic Systems**

- Identifying the different types of Hydroponic Systems
- Hydroponic systems compatibility and resources
- Basic Hydroponics home/small scale system (materials & cost)

### **Session 3 – Plant Nutrients, Fertilizer Formulation & Blending & Water Quality Testing**

- Plant Fertility and Hydroponic Chemistry
- Water Quality Testing
- Chemical formulation of plant nutrients

### **Session 4 – Practical Skills**

- System Design and Construction

### **Session 5 - Renewable Solar Energy in Agriculture**

- Utilization of Renewable Energy in Agriculture
- How does the Solar Power System work
- Selecting Photovoltaics System Components, Solar Panel, Charge Controller, Battery
- Inverter
- Mounting and Connecting The system To Hydroponics Systems
- Maintained the System and costing

### **Session 6 – Plant Agronomy and Crop Protection**

- Main pests and diseases associated with Hydroponic farming.
- Measured to mitigate major pests and diseases associated with hydroponic farming
- IPM -Integrated Pest Management

### **Session 7 – Food Safety. HACCP and SOP (Standard Operational Procedure)**

- Introduction to Food Safety
- Introduction to Post-Harvest Technology and Operational Management

### **Session 8 – Sustainable Hydroponic Business Plan**

- Capital investments
- Recordkeeping and record-keeping systems
- Small-scale business model for a hydroponic start-up
- Resources