GREENHOUSE CAPACITY BUILDING & TRAINING CENTRE

ENTRY REQUIREMENT / ADMISSION POLICY

1. Applicant must be a Ghanaian.
2. Applicant must have Degree, HND, or Diploma in Agriculture.
3. Applicant must have completed National Service.
4. Applicant should be in the age range of 21 – 35.
5. Applicant should exhibit interest in farming as a profession.
6. Applicant must pass a competitive interview.

GENERAL RULES AND REGULATIONS FOR TRAINEES

1. All trainee meetings (classroom, greenhouse, trips, etc.) are compulsory.
2. No form of lateness will be tolerated. Trainees should report for all meetings at specified times. Defaulting students will be penalized.
3. There should be no fighting. Trainees engaged in fighting will be dismissed.
4. Any incidence of theft will attract outright dismissal.
5. Any trainee found using drugs (wee, marijuana, etc.) will face outright dismissal.
6. Trainees should be fully responsible for their personal belongings.
7. Trainees should ALWAYS seek permission before leaving the training centre. Exeat forms are available with the administrator.
8. Trainees with health/allergy issues, or those who strictly do not eat certain foods should inform the administrator at the beginning of the course.
9. Trainees who destroy or vandalize properties belonging to the institution will pay for it and further sanction may be taken against the guilty party.
10. Trainees with academic challenges should not hesitate to seek assistance from trainers.

PROGRAM DESCRIPTION / OUTLINE

The Greenhouse Capacity Building and Training Centre (GCBTC) is a facility of the Ministry of Food and Agriculture (MoFA), supervised by its subsidiary, Ghana Irrigation Development Authority (GIDA) and being implemented by Agritop Limited. The plan is to establish three centres of higher learning in Greenhouse Vegetable Production. The centre has the Commercial Farm and the Practical Agricultural Course (PAC). The idea is for the commercial farm to fund activities of the training program. The mission of the centre is to develop and improve communities and peoples' life standards through Agriculture and food security education.

PAC is a thirteen-week program for graduates of Agriculture in various Agricultural Institutions in Ghana. Trainees are accommodated, fed and taught at the training centre for the full period of the course. Part of the period is spent in class, learning about vegetable production technologies and the rest of the period spent practicing in the greenhouse farm. Class lectures are mostly done in PowerPoint presentations, with videos, graphs, charts, tables and other means that enhances understanding. Additionally, there are field trips to neighbouring open field farms and other organizations involved in agriculture in order to compare or learn more from their practices. In the end, trainees are groomed with principles to solve agricultural problems in different situations and conditions.

LIST OF COURSES (find attached in spreadsheet)

CURRICULUM (COURSE CONTENTS)

1. **Planning, Soil / Media Preparation & Nursery (PAC 001)**
    a. Planning your Season
    b. Units in Agriculture
    c. Generating Planting Materials
    d. Introduction to Genetic Principles
    e. Seed Handling and Storage I
    f. Seed Handling and Storage II

g. Grafting
h. Nursery for Ornamentals
i. Soil and Water Relationship
j. Five Soil Test Parameters
k. Soil Preparation
l. Soil Fumigation
m. Mulching
n. Solar Sterilization
o. Tensiometers
p. Soilless Culture EC

2. Crop Protection (PAC 002)

a. Host Plants
b. Insects and Weeds
c. Weeds
d. Insects
e. Insect Vectors
f. Diseases
g. Fungi I & II
h. Bacteria
i. Virus
j. Plant Virus Dissemination
k. Plant Parasitic Nematodes
l. Root Knot Nematodes
m. Inspection
n. Crop Protection Principles I
o. Crop Protection Principles II
p. Pesticide History
q. Pesticide Development
r. Pesticide Regulation
s. Pesticide Application

t. Crop Rotation
u. Diagnostic Plant Problems and Diseases
v. Experiments in Crop Protection

3. Irrigation & Fertigation (PAC 003)

a. Water Sources and Filtration
b. Introduction to Irrigation
c. Drip Irrigation Principles I
d. Drip Irrigation Principles II
e. Drip Irrigation Range of Products
f. Drip vs Crops
g. Irrigation System Maintenance
h. Fertigation Principles
i. Advanced Fertigation I
j. Advanced Fertigation II
k. Climate Consideration in Fertigation
l. Fertigation Planning for Greenhouses

4. Greenhouses (PAC 004)

a. Greenhouses around the World
b. Structures I & II
c. Greenhouse Covers
d. Net uses in Greenhouse
e. Optimal Plant Environment I
f. Optimal Plant Environment II
g. Air Circulation
h. Low and Walk-in Tunnels
i. Growing in Tropical Conditions
j. Greenhouse Growing Systems
k. Trellising Tools

5. **Land Conservation & Soilless Cultivation (PAC 005)**
    a. Soilless Cultivation I
    b. Soilless Cultivation II
    c. Conservative and Conventional Tillage
    d. Minimum and Zero Tillage
    e. Sustainable Agriculture
    f. Organic vs Synthetic Chemicals in Farming
    g. GMO
    h. CRISPR

6. **Greenhouse Vegetable Production (PAC 006)**
    a. Growing Tomato I, II & III
    b. Cucumber in Greenhouses
    c. Cucumber Diseases
    d. Pepper I
    e. Pepper II
    f. Pepper Petiole Testing
    g. Growing Eggplants
    h. Foliar Nutrition
    i. Root Absorption Mechanism

7. **Global Technologies in Crop Production (PAC 007)**
    a. Vegetable Production in Israel
    b. Cocoa Production
    c. Cocoa Diseases
    d. Cassava I
    e. Cassava II
    f. Plantain I
    g. Plantain II
    h. Yam
    i. Girdling in Citrus

j. Date Palm

8. Postharvest Technology (PAC 008)

a. Postharvest Principles
b. Pre-cooling
c. Sanitation
d. Optimum Storage Temperature RH
e. Ripening and Controlled Atmosphere
f. Shelf Life I & II
g. Storage Disorders
h. Sorting, Packaging and Distributing I & II
i. Wrapping and Packing Technologies I & II
j. Packaging and Marketing
k. Modern Marketing
l. Quick Phosphine Fumigation
m. Cocoa Fumigation
n. Peanut Fumigation

9. Management & Agribusiness (PAC 009)

a. Record Keeping
b. Decision Making
c. Management
d. Agribusiness Management
e. Farm Management
f. Mother Farm
g. Branding
h. International Standards for Export

ASSESSMENT METHODOLOGY

1. Initial "knowledge test" exam is written on first day of course to assess course participants. This is not included in final exams collation.
2. Four main examinations are written within the course period.
3. Each exam covers three subjects, usually every three weeks.
4. Exams also cover practical activities done in the greenhouses.
5. Each exam contributes 25% of total score of trainee.

BRIEF DESCRIPTION OF FACILITIES

The GCBTC is a world class facility, comparable to any advanced training centre. It provides a serene environment for learning which in turn instills focus for trainees within the training period. The facility has a well-furnished accommodation for 30 trainees at a time, offices, library, lecture hall, laboratory and a canteen. Also, there is accommodation for trainers and managers over 1,300m^2 structures. For the purpose of training, the centre has six growing tunnels of 210m^2 each. This is where trainees explore Agricultural technologies and innovation through practice. For the main production area, there are sixteen long tunnels of 480m^2 each and corridor, total over 8,000m^2, a complete greenhouse of 5000m^2 and an open field of 15000m^2. Also located on the site is a hydroponic greenhouse of 240m^2 and a nursery structure of 210m^2. Total growing area for GCBTC is approximately 3Ha. Other structures include fertigation control centre, storage area and a postharvest centre. The facility has an open gym for work out.

COURSE TIME TABLE

WEEK	DAY	MORNING	BREAK	AFTERNOON
1	1	Arrival of trainees		Arrival of trainees
	2	Orientation, Knowledge test		Group formation, assignment, trainer-group meeting, Greenhouse working regime and rules, Greenhouse tour
	3	Opening presentation		Greenhouse
		Units in Agriculture		
	4	Planning your season		Nursery preparation practical
		Generating planting Materials		
	5	Introduction to genetic principles		Greenhouse
		Seed handling and storage I & II		
	6	Tutorial / Greenhouse mop-up		
2	1	Grafting	LUNCH BREAK	Greenhouse
		Nursery for ornamentals		
	2	Soil and water relationship		Greenhouse
		Five soil test parameters		
	3	Soil preparation		Greenhouse
		Soil fumigation		
	4	Mulching		Greenhouse
		Solar sterilization		
	5	Tensiometers		Greenhouse
		Soilless Culture EC		
	6	Tutorial / Mop-up		
3		Host plants		Greenhouse
		Insects and weeds		
		Weeds		
		Insects		Greenhouse

		Insect vectors	
		Diseases	
		Fungi I & II	Greenhouse
		Bacteria	
		Virus	
		Plant virus dissemination	Greenhouse
		Plant Parasitic nematodes	
		Root Knot nematodes	
		EXAMS	Greenhouse
		Discussion of exams	
		Tutorial / Mop-up	
4	1	Inspection	Greenhouse
		Crop protection principles I	
	2	Pesticide History	Greenhouse
		Pesticide development	
	3	Pesticide regulation	Greenhouse
		Pesticide application	
	4	Crop Rotation	Greenhouse
		Crop protection principles II	
	5	Crop protection principles II group exercise	**Course Break**
		Course Break	
	6	**Course Break**	
5		Water sources and filtration	Greenhouse
		Introduction to irrigation	
		Drip Irrigation Principles I	
		Drip Irrigation Principles II	Greenhouse
		Drip irrigation range of products	
		Drip vs crops	

		Irrigation system maintenance	Greenhouse
		Fertigation Principles	
		Advanced Fertigation I	Greenhouse
		Advanced Fertigation II	
		Climate consideration in fertigation	
		Fertigation planning for greenhouses	Greenhouse
		Tutorial / Mop-up	
6	1	Opening: Greenhouse in the world	Greenhouse
		Structure I	
		Structure II	
	2	Greenhouse Covers	Greenhouse
		Net uses in greenhouse	
		Optimal Plant environment I	
	3	Optimal Plant environment II	Greenhouse
		Air Circulation	
	4	How to grow vegetables in Greenhouse	Greenhouse
		Low and walk-in tunnels	
		Growing in tropical conditions	
	5	**EXAMS**	Greenhouse
		Greenhouse Growing Systems	
		View and describe	
	6	Tutorial / Mop-up	
7	1	Trellising tools	Greenhouse
		Soilless cultivation I	
	2	Soilless cultivation II	Greenhouse
		Vegetable production in Israel	

	3	Conservative and Conventional tillage	Greenhouse
		Minimum tillage	
		Zero tillage	
	4	Sustainable Agriculture	Greenhouse
		Organic vs synthetic	
	5	Organic debate	Greenhouse
		GMO views	
	6	Tutorial / Mop-up	
8	1	Growing Tomatoes I	Greenhouse
		Growing Tomatoes II	
		Growing Tomatoes III	
	2	Cucumber in greenhouses	Greenhouse
		Cucumber diseases	
	3	Pepper I	Greenhouse
		Pepper II	
	4	Pepper petiole testing	Greenhouse
		Growing eggplants in China	
	5	Root absorption mechanism	**Course break**
		Foliar nutrition	
		Course break	
	6	**Course break**	
9	1	Cocoa I	Greenhouse
		Cocoa Diseases	
	2	Cassava I	Greenhouse
		Cassava II	
	3	Plantain I	Greenhouse
		Plantain II	
	4	Yam	Greenhouse

		Girdling in Citrus	
	5	EXAMS	Greenhouse
		Discussion of exams	
	6	Tutorial / Mop-up	
10	1	Postharvest Principles	Greenhouse
		Pre-cooling	
		Sanitation	
	2	Optimum storage temp and RH	Greenhouse
		Ripening and Controlled Atmosphere	
	3	Shelf Life I	Greenhouse
		Shelf Life II	
	4	Storage Disorders	Greenhouse
		Sorting, Packaging and Distributing I	
	5	Sorting, Packaging and Distributing II	Greenhouse
		Wrapping and Packing Technologies I	
	6	Tutorial / Mop-up	
11	1	Wrapping and Packing Technologies II	Greenhouse
		Packaging and Marketing	
	2	Modern Marketing	Greenhouse
		Quick Phosphine	
	3	Date Palm	Greenhouse
		Cocoa Fumigation	
	4	Peanut fumigation	Greenhouse
		Trainee proposal presentation	
	5	Trainee proposal presentation	Greenhouse

		Trainee proposal presentation		
	6	Tutorial / Mop-up		
12	1	Decision Making		Greenhouse
		Management		
	2	Agribusiness management		Greenhouse
		Farm management		
	3	Mother Farm		Greenhouse
		Branding		
	4	Diagnostic plant problems and diseases		Greenhouse
		Record Keeping		
	5	Experimental design		Greenhouse
		International Standards for export		
	6	Tutorial / Mop-up		
13		Course Summary, Examination, Course Closing		