The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Agricultural and Plantation Engineering

Bachelor of Industrial Studies Honours (Agriculture) Degree Programme

AGW4401 Industrial Training 1 (Agriculture)

Training standards

(07 pages)

Industrial Training I (AGW4401) module consists of 15 units covering different areas of agriculture. The units have been grouped into 2 main sections: A and B. The students should select these units as mentioned below to complete the 13 weeks of the specific training requirement.

- **Section A compulsory:** 8 weeks to cover units 1, 2 and 3 for all the students.
- **Section B optional**: students can select the units to cover balance 5 weeks amounting to the total duration of 13 weeks of training requirement.

If a student has experiences in particular areas, exemptions could be granted from them after evaluation by the department. In order to get the exemptions the student should provide evidence for such experience by submitting a report certified by the institution in which the student gained such experiences and face an interview.

Section A

Unit Description 01 -Organizational structure and Layout.

Duration: 1 week.

1. Familiarize with the organizational structure and their responsibilities at each level.
2. Familiarize with the building layout and functions of each section.
3. Familiarize with the activities of the department of human resource and available documents for certification process.
4. Familiarize with the labor rules, leave entitlements, welfair and training plan.
5. Acquaint with occupational health and safety measures and perform risk management assessment.
6. Familiarize with the emergency procedures for fire safety, power cuts related in house processing section cleaning procedures.
7. Familiarize with the machinery/ tool safety, laboratory safety, Environmental safety with green concepts, chemical, biosafety and Biosecurity Safety and Compliance.
8. Familiarize with the waste disposal system and waste treatment: waste disposal of biological effluent, management of odor and contamination, how to avoid contamination of process water.

Unit Description 02 -Land Preparation and Tillage.

Duration- 1 week.

- Identify different land preparation methods for different crops.
- Familiarize with the selection of land based on crops, land leveling and seed bed preparation.
- Familiarize with different equipment/tools use for land preparation/tillage.
- Identify different soil erosion control methods and soil conservation techniques/ Designing of terraces.
- familiarize with the soil fertility regenerating systems, i.e. In situ mulch, Live mulch, Cover crops, Alley cropping, Agro-forestry systems.
- Familiarize with soil groups/types, soil testing, analysis and how to determine the fertilizer requirement crop/field.
- Identify problem soils and soil amalgamation techniques.

Unit Description 03- Crop Cultivation and Management.

Duration-6 weeks.

- Paddy cultivation: familiarize with new varieties, agronomic and cultural practices, nursery management techniques, soil and Water management, harvesting and processing.
- Cultivation and management of vegetables – Low-country or Up-country vegetables, familiarize with new varieties, agronomic and cultural practices, nursery management techniques, soil and water management, harvesting and packing.
- Cultivation, management, harvesting and processing of other field crops - Grain legumes, Soybeans, Winged Bean, Groundnut, Green Gram, Black Gram, Gingerly, Kurakkan etc.
- Cultivation, management, harvesting and processing of Cash crops: Pepper, Clover, Cardamom, Cinnamon etc.
- Cultivation and management of Fruit Crops.
- Familiarize with harvesting methods for reducing post-harvest losses of fruits, vegetables and other perishables.
- Familiarize with nursery preparation and management techniques.
- Familiarize with propagation Methods: Budding, Grafting, Layering and Tissue culture etc.
- Familiarize with the Climatological measurements, i.e. Rainfall, Relative humidity, Wind speed, Sunshine hours, Evaporation, Soil temperature etc.

Section B

Unit Description 01- Irrigation Methods.

Duration-1 week

- Familiarize with different irrigation methods, i.e Basin irrigation, Border irrigation, Furrow irrigation, Flood irrigation, Drip irrigation, Sprinkler irrigation, Pot irrigation etc.
- Design of irrigation systems.
- Measurement of Irrigation water and river gauging i.e. Current meter method, Weir, Parshall flume, 'V' notch.
- Standards of irrigation water, Testing methods of irrigation water requirement, water quality.
- Identify different operational and maintenance aspects of irrigation canals.
- Designing of canals. operation studies to determine the irrigation water requirement of different types of crops cultivate in Maha and Yala seasons.

Unit Description 02 -Agricultural Machines.

Duration-1 week

- familiarize with the four wheel and two-wheel tractors handling, power transmission, engine, cooling system, fuel system, electrical system, hydraulic system, lubrication system, attaching implements etc.
- Constructional features, operation and maintenance of Threshers, Seeders, Water pumps etc.

Unit Description 03- Food Processing.

Duration - 1 week

- Dairy products: milking by following sanitary conditions, storage at correct temperature and determine quality parameters, processing for value addition at farm level (curd, Ghee and yogurt production).
- Small and large scale applications on cleaning, washing, sorting and grading, packaging of fruits and vegetables, storage and value addition by processing i.e Drying, Jam, Sauce and pickles production etc.

Unit Description 04- Livestock Production.

Duration - 1 week

- Poultry for egg production: breeds, incubation, hatchery, brooder, layer management, food, housing, disease management.

  Poultry for meat production: breeds, broiler management, housing and

  feeding.

  Other poultry: Duck, Geese, Turkey etc.

- Cattle management: breeds, Calf management, Heifer management, lactating cow management.

- Fresh water fish culture: breeds, construction and preparation of pond systems, rearing and harvesting, prevention and control of diseases.

- Shrimp farming.
- Management aspects of Pigs, Rabbits and other livestock.

Unit Description 05 – Horticulture.

Duration - 1 week

- Anthurium culture: familiarize with different varieties, nursery management, insect pest management, fertilization & irrigation, harvesting, Quality Standards, packaging for export market and local market, economical aspects of the business.

- Orchid culture - familiarize with different varieties, nursery management, insect pest
  management, fertilization & irrigation, harvesting, Quality Standards, packaging for export market and local market, economical aspects of the business.

- Cut foliage production and other pot plants for sale: identification of different varieties, nursery management, insect pest management, fertilization & irrigation, harvesting, Quality Standards, packaging for export market and local market, economical aspects of the business.
- Propagation Methods, i.e. tissue culture, végétative propagation etc.

- Mushroom cultivation: identification of different varieties, media preparation, growing conditions, insect pest management, harvesting, quality standards, packaging for export market and local market, economical aspects of the business.
- Hydroponics and Aeroponics techniques.

Unit Description 06 - Plantation crops.

Duration - 1 week

- Cultivation and management aspects of Tea: new varieties, nursery management, field establishment, fertilizer application, insect pest and weed management, soil and water management, harvesting and processing.
- Rubber cultivation and management: new varieties, nursery management, field establishment, fertilizer application, insect pest and weed management, soil and water management, harvesting and processing.
- Coconut cultivation and management: new varieties, nursery management, field establishment, fertilizer application, insect pest and weed management, soil and water management, harvesting and processing.

Unit Description 07- Plant Protection and Biotechnology.

Duration -1 week

- Identification of insect pest attacks and diseases:
  - Identify the insect pests and the nature of attacks, symptoms, signs.
  - Identify the causal organisms, symptoms and signs of diseases.

- Familiarize with various methods of lab procedures on pathogen extraction, culturing and identification.
- Familiarize with the pest control methods and procedures follow to manage the pest attacks, Integrated Pest Management (IPM) methods.
- Identify the pesticide categorization, formulations and applications.
- Learning different methods of insect pest distribution and epidemic level calculations.
- Familiarize with molecular biology equipment: identify the molecular biology related equipment and their operation procedures.

- Explain molecular biology: Macromolecule - DNA extraction, Gel electrophoresis, Macromolecule blotting and probing, Polymerase Chain Reaction (PCR), Recombinant DNA technology and Genetic engineering procedures.

- Observe the applications of molecular markers: Random amplification of polymorphic DNA (RAPDs), Restriction fragment length polymorphism (RFLP), Amplified fragment length polymorphism (AFLP), Simple sequence length polymorphism (SSLP), Variable number tandem repeat (VNTR).

- Learn plant tissue culture laboratory: Layout and the equipment, methods of maintaining sterilized environment.

- Explain micro propagation procedure: media preparation, culturing, hardening.

- Familiarize with Plant genetic resources conservation methods.

- Learn to maintain laboratory safety.

Unit Description 08 - Preparation of the produce for the Market.

Duration-1 week.

- Methods of material acceptance and dispatch: Facilities for inspection, handling and storing done in the field, field-cooling, washing, stacking. dispatch, environmental control for perishable goods.

- Grading and inspection: Methods of grading, equipment used, how off-grades are disposed.

- Quality control methods and inspection procedure: basic quality control aspects at farm level, i.e. Good Agricultural Practices (GAP) and Good Management Practices (GMP) to cover different aspects of quality parameters.

- Marketing channels and distribution system: How the marketing system defines packaging and quality assurance methods. The distribution net-work's influence on size of package and methods of presentation.

Unit Description 09 - Mechanical handling of farm produce.

Duration-1 week.

- Types of produce transfer machines found in rice processing at field level and processing plant such as conveyors, elevators etc.
- Method of supplying power to them through motors, engines, belt drivers, gear boxes etc.
- How to assess capacity and power consumption of such equipment.
- Safety standards to be followed.
- Operation and maintenance of such equipment.

Unit Description 10 - Energy and power supply.

Duration-1 week.

- How electrical, motive and thermal energy is obtained for the activities.
- Electrical energy, switch gear, leak protection, safety.
- Engine driven machinery rating and duration of operation between stops.
- Thermal energy, steam, hot water, delivery, insulation, safety relief valves, fire protection.
- Inspection and factory ordinance pertaining to furnaces, boilers, compressed-air, chimneys and fire-escapes.

Unit description 11 - Land use mapping.

Duration -1 week.

Land classification, Capability classes, Land use maps, Reading aerial

photographs, GIS

Unit description 12 - Rural development.

Duration -1 week.

- Agricultural extension, awareness programmes and communication procedures.
- Familiarize with technology transfer and community development work.

Training Placement and Monitoring

Training placements are arranged by the Industrial Training Engineer of the faculty according to an approved procedure by the faculty and with the coordination of National Apprentice and Industrial Training Authority (NAITA).

The Training Engineer and the academic staff of the Department of Agricultural and Plantation Engineering are required to monitor the progress of trainees either by visiting training organizations on regular basis or/and by calling reports on the status of progress from the responsible persons under whom the trainees are working on.

Evaluation of Trainees

The trainees are evaluated at the end of training period based on a comprehensive report submitted by them and performance of a viva-voce examinations conducted by a panel consisting of staff of the department of Agricultural and Plantation Engineering, representative from NAITA and external examiner/s. The evaluation process is administrated by the Training Engineer according to the faculty approved guidelines.

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