VIDYASAGAR UNIVERSITY

AGRO SERVICE
(MAJOR)

Under Graduate Syllabus
(3 Tier Examination Pattern)
w.e.f. 2014-2015

REVISED

Vidyasagar University
Midnapore 721 102
West Bengal

VIDYASAGAR UNIVERSITY
Undergraduate Syllabus

AGRO SERVICE

Three year degree course divided into Part I, Part II and Part-III of one year duration

COURSE STRUCTURE

Part-I
Full marks 200

Paper- I	Unit I: Agro service - General concept	Marks 50
(Theory)	Unit II: Basic concept of Horticulture (olericulture floriculture and fruit production)	Marks 50
Paper-II	Unit I: Basic concept of soil	Marks 50
(Theory)	Unit II: Irrigation Management	Marks50

Part II
Full marks 300

Paper-III	Unit I: Seed Production Technology	Marks 50
(Theory)	Unit II: Diagnosis of Crop Health problems	Marks 50
Paper IV	Unit I: Seed Technology	Marks50
(Practical)	Unit II: Soil Testing	Marks 50
Paper-V	Unit I: Agriculture Machineries & Irrigation	Marks 50
(Practical)	Unit II: Plant Protection	Marks 50

Part III
Full marks 300

Paper VI (Theory)	Unit I Manure Fertilizer & Biofetilizer	Marks 50
	Unit II Post harvest Management & Food processing	Marks 50
Paper VII (Theory)	Unit I: Agricultural machineries and Implements	Marks 50
	Unit II:Pesticides and their uses	Marks 50
Paper VIII (Practical)	Unit I: Fertilizers and Biofertilizers	Marks 50
	Unit II:Post Harvest & food processing	Marks 50

Total Marks	Part-I	200
	Part II	300
	Part III	300
	Total	**800**

Internal Assessment will continue which will be 10% of the total marks

Agro service detailed syllabi w.e.f. (2014-15)

Part-I
Paper-I
Unit-I (Marks 50)
General Concept

1. Basic Concepts of Agro Service its scope and importance.
2. Types of service required for socio economic development of the farming community.
3. Agro climatic zone of West Bengal.
4. Soil classification and suitable land use, with special reference to West Bengal.
5. Concept of cropping system and cropping pattern, Soil productivity and soil fertility.
6. Crop ecology – Microclimate, harvest index, sink source ratio Ideotype for some crops.
7. Productivity and soil fertility
8. Problem and prospect of dry land agriculture
9. Erosion and soil conservation

Paper –I
Unit-II (50marks)
Basic Concept of Horticulture
(Olericulture Floriculture & Fruit production)

1) Classification of vegetable and its importance
2) Cultivation of Tomato, Okra, Brinjal, Chillis, Cabbage, Cauliflower and some cucurbit crops
3) Landscape gardening - history & development - Hindu Mughal English (Lawn Hedge Edge)
4) Formal and informal gardening: kitchen, rock
5) Cultivation of rose chrysanthemum
6) Training and pruning of fruit crop, their objectives
7) Cause, nature and control of fruit drop affecting quality of fruit.

Paper-II
Unit I (50 marks)
Basic Concept of soil

1) Soil and its concept
2) Physical properties of soil
3) Soil air and soil water physical and biological classification of clay
4) Soil colloid and its nature and importance chemical composition of clay
5) Concept of problems soil i.e. Acid soil, Saline Soil and alkaline soil
6) Analytical method of soil testing and fertilizer recommendation

Paper-II
Unit-II
Full Marks – 50

Irrigation Management

1. Importance of irrigation in crop production
2. Water resources – Surface water, ground water and their uses.
3. Factors affecting water resources – Climate, Physiographic, Geological
4. Methods of irrigation:
   a) Surface irrigation – i) Border-strip, ii) Cheek basin, iii) Furrow, iv) Ring method (for chards)
   b) Sprinkler and Drip irrigation

5. Conveyance of irrigation:

a) Conventional, b) Unlined & lined open channels, c) Fixed & Flexible pipes, d) Underground pipe system

6. Irrigation Scheduling:
   i) Time of irrigation, ii) Physiological stages of the crop, iii) Soil moisture status, iv) Soil-water tension, v) Evapo-transpiration

7. Poor quality irrigation water – Saline, Sodic, Toxic and their management – i) Land leveling, ii) Leaching & drainage, iii) Selection of crop, iv) Use of amendments, v) Application of organic
8. Integrated (surface & ground water combination) irrigation management for sustainable agriculture
9. Critical stages of irrigation in various crops
10. Integrated irrigation Management
11. Water shed Management

Part II
Paper III
Unit-I
Marks 50

Seed Production Technology

1. Seed – its importance in agricultural development
2. Seed morphology, development & classification
3. Production techniques of some important crops of the zone
4. Basic principles of seed production
5. Seed production in phases – Breeder seed, Foundation and Certified seed
6. Qualities of improved seed and maintenance of Purity
7. Deterioration of seeds and varieties
8. Post-harvest handling – thresning, cleaning, drying, grading, seed treatment and storage
9. Seed testing, seed certification and seed Act
10. Concept of hybrid (F_1) Seed production
11. Methods of vegetative propagation 'budding' grafting, cutting, layering etc. and tissue culture technique

Paper III
Unit-II
Full Marks 50
Diagnosis of Crop Health Problems

1. Causes of health Problems of crops
   Pest: Insects & non-insects, rodents, rematodes, birds, snails.
   Disease: fungal, bacterial, viral

2. Diagnosis of health problems of
   a) Rice stemborer, BPH, Gall midge, leaf folder, hispa, Gandhibug, Bacterial blight, sheath blight, brown spot blast, false smut, root & short rot, ufra (3n deficiency)
   b) Wheat – seedling blight, smut, rust.
   c) Jute – Semi-looper, hairy caterpillar, root-knot; stem rot, wilt
   d) Pulses – Aphids, Pod borer, hairy caterpillar, stem fly, Podfly, mosaic, powdery mildew, root rot, wilt, blight
   e) Oil seeds – aphid, leafwebber, hairy caterpillar, termite, leaf blight, rust, club root, foot rot.
   f) Vegetables:
      i) Solanaceae – aphids, cut worms, fruit & shoot borer, mealy bug, epilachna beetle; root rot wilt.
      ii) Malvaceae – Jassids, Whitefly, aphids, leaf folder, fruit, borer, mosaic, wilt, root knot.
      iii) Curcurbitaceae – epilachna beetle, red punk beetle; mosaic, powdery mildew, wilt, root knot, root rot, downy mildew
      iv) Cruciferae – aphids, caterpillar, cabbage, head borer, black rot, MO & B. deficiency in cauliflower.
   g) Fruits:
      i) Mango: hopper, mealy bug, fruit fly, borer, malformation, leaf blight, fruit rot.
      ii) Citrus, leaf miner, white fly, scale, canker, dicaback, scab.
      iii) Banana: Weevil, wilt, pseudostem rot, sigatoka, bunchy top
      v) Guava: wilt, root rot, scab.
      vi) V) Coconut: rhinoceros beetle, wilt, budrot, fruit drop.
   h) Flwoers – Scale, mealy bug, aphid, leaf webber, dicback, powdery mildew, leaf blight, slow wilt.

Paper-IV
Unit-I
Marks 50

Seed Technology (Practical)

1. Identification of different groups of seed and seed sampling
2. Purity analysis of some seed samples
3. Determination of seed moisture
4. Pre-sowing treatment of seeds/seedlings
5. Individual plot for seed raising (sowing to harvest)
6. Demonstration of hybrid seed production techniques
7. Different methods of vegetative propagation
8. Visit to seed producing farms and seed testing laboratory

Paper-IV
Unit-II
Full Marks – 50

Soil Testing (Practical)

1. Collection of soil samples – uniformity and depth.
2. Determination of pH, EC, Organic C, available N.P.K. in soils.
3. Visual diagnosis of deficiency symptoms in Plants
4. Quick test for fertilizer adulteration by Fertiliser testing Kit

Paper-V

Unit-I

Full Marks-50

Agricultural Machineries & Irrigation (Practical)

1. Operation of ploughs, disc plough, harrows & cultivators
2. Study of sub-drill, thresher
3. Operation of power tillers, dusters and sprayers
4. Operation of pump set and Engines
5. Visit to machinery workshop
6. Measurement of iggigation water through 'V' notch, meter gate.
7. Operation of sprinkler and Drip system
8. Methods for testing quality of irrigation water use of water testing kit.
9. Visit to irrigation command area and Metereological of survatory

Paper-V

Unit-II

Full Marks 50

Plant Protection (Practical)

1. Identification and listing of diseases & Insect Pests
2. Collection of specimen & Herbarium making
3. Examination of specimen under microscope
4. Field visits for recording seasonal diseases & Pests
5. Preparation and application of homemade products
6. Preparation of spray solution
7. Use of duster, sprayer and acquaintance with spray nozzles
8. Seed treatment: dry & wet method
9. Control of rodent, termite and birds
10. Weed control in rice field
11. Funigation of stores

Part-III
Paper-VI
Unit-I
Marks – 50

Manures, Fertilizer & Bio-fertilizer

1. Importance of organic manures in crop production
2. Different groups of bulky and concentrated manures – their importance in soil fertility and crop health
3. Preparation of bulky organic manures – composting, phosphor-compost, Vermi-compost
4. Bio-fertilizers
   i) Rhizobium, Azotobacter
   ii) Cyanobacteria (BGA), Azolla: their multiplication and field arplication.
5. Fertilizers: Macro and Micro, elements essential for plant growth
6. Straight, complex and mixed fertilizers
7. N. P.K. carrying fertilizers – their agronomic efficiency
8. Secondary nutrient (Cu, Mg, S) supplying fertilizers
9. Micro-nutrients, their importance
10. Fertilizer management, Fertiliser calculation
11. Importance of soil fertility in relation to crop production, nutrient necessary, Organic, inorganic, different sources, Importance of organic fertilizer manures, compute biofertilizer, Phosphocompost, micro nutrient management, Vermicompost, green manure

Paper-VI
Unit-II
Full Marks 50

Post Harvest Management and Food Processing

1. Sources of post-harvest losses of food grains, management practices to minimize them
2. Food grain storage structure
3. Post-harvest operations – Threshing, cleaning, drying, milling, separation, packaging
4. Food preservation and Processing principles
5. Drying and Dehydration of vegetables & fruits – Paseturisation, sterilization and blanching
6. Study of Backery products – bread, biscuits
7. Principles of preparation of juices and syrups.
8. Preservation with Sugar – Jam, Felly, Marmalade
9. Preservation with salt & Vinegar – Pickles, Churney and Sauce
10. Preparation of tomato products
11. Problems associated with storage of products and their remedies – Marketing of preserved products.
12. Requirement of equipment and machinery for a small food processing unit.
13. Mushroom cultivation techniques.

Paper VII
Unit I
Full Marks -50

Agricultural machinery & implements

1. Principle and working of indigenous and improved plough
2. Mouldboard and disc plough
3. Seed- cum- fertilized drill
4. Cultivator, harvesting equipments, thresher, chaff-cutter
5. Principles and working of dusters and springers
6. Principles of irrigation systems (Drip and Sprinkler)
7. Engine: function of diesel and petrol engines, study of their various systems; working and maintenance of tractor and power-sprayer; operation of water lifting pumps

Paper-VII
Unit-II
Full Marks-50

Pesticides & Their Use

1. General grouping and concept
   a) Fungicides & Bactericides; b) Insecticides, Vodenticides, Nematicides; c) Weedicides
2. Preparation and uses of home- made product: Tobaco decoction, Kerosine emulsion, neem preparation Burdeaux mixture & paste
3. Copper fungicides: Sulphur fungicides and their uses
4. Organo-phosphorus compounds non-systemic, systemic

5. Orgno-chlorides
6. Carbamate
7. Anti- biotics
8. Weedicides
9. Seed treatment and soil treatment
10. Integrated Pest management (I.P.M.)

Paper-VIII
Unit-I
Full Marks-50

Fertilizers and Biofertilizers

1. Identification of different manures, fertilizers & Bio- fertilizers.
2. Preparation of household compost, phosphor-compost & Vermicompost
3. Maintenance and Mass production of Azolla and BGA
4. Crowing Green manuring crops.

Paper- VIII
Unit II
Full Mark - 50

Post Harvest & Food Processing (Practical)

1. Visit to storage structures and assessment of losses
2. Visit to Backery to study of its product, bread, biscuit
3. Drying, dehydration, canning, bleaching of fruit and vegetables
4. Preparation of various food processing items
5. Visit to food processing industries
6. Production of mushroom

EQUIPMENTS

Seed production Technology (Practical)

1. Seed Blower, 2. Germinator, 3. Germination Box, 4. Seed & grain sieves, 5. Germination paper, towel, blotters, 6. Purity work Board, 7. Counting Board, 8. Forceps, 9. Magnifier, 10. Balance-physical & Analytical, 11. Sample pan, 12. Divider, 13. Refrigerator, 14. Petri-dishes, 15. Dissecting equipment 16. Wash bottle, 18. Measuring cylinder 19. Universal Moisture tester, 20. Oven and 21. Pan Balance.

Soil Testing (Practical)

1. PH meter, 2. Conductivity Bridge, 3. Mechanical Shaker, 4. Nitrogen Digestion set, 5. Hot- air oven, 6. Spectro-Photometer, 7. Flame Photometer, 8. Grinding machine, 9. Physical and Chemical Balance, 10. Soil Augors, 11. Distillation water plant, 12. Soil Testing Kit 13. Fertilizer Testing Kit, 14. Hot Plate.

Plant Protection (Practical)

1. Hand lenses, Scalpel, Scissors, Bucket, Sprayers, Strainer
2. Plant clinic – shelves, Herbarium rack, Display Boards, PH Paper

Seed Production Technology

1. Seed Technology – R. L. Agarwal
2. Seed Production Technology – J. P. Srivastava & L. T. Simarski
3. Seed Storage and Longevity – J. F. Harrington
4. Vegetable and Flower Seed Production – D. K. Salunkhe, B. B. Sesai & N. R. Bhat

5. Seed borne diseases of field crops and their control – V. K. Agarwal & Y. B. Hene.
6. Viability of Seeds – E. M. Roberts.
7. Seeds – The Year Book of Agriculture 1961 VSDA
8. Seed Testing Mannual – G. V. Chalam, Amar Singh, J. E. Douglas

Manures, Fertilisers and Bio-fertilisers

1. Handbook of Manures and Fertilisers – I.C.A.R.
2. Nature and Properties of Soils – N. C. Brady.
3. Soil Conditions and Plant Growth – W. E. Russell
4. Biofertilisers – Potentionalities and Problem – S. P. Sen and P. Palit
5. Fertilisers, Organic manures, Recyclable waste and Bio-fertilisers – H. L. S. Tandon.
6. Phosphate Solubilishing Micro-Organisers and Bio-fertilisers - A. C. Gaur
7. Organic Manures – A. C. Gaur.
8. Methods of Soil analysis – C. A. Black
9. Soil and Plant analysis – C. S. Piper
10. Hunger Sign in crops - R. O. White
11. Soil Chemical analysis – M. L. Tackson

Farm Management, Credit Planning & Information System

1. World class competitiveness through total quality management – S. M. Mody, DBS Trust.

Diagnosis of Crop Health Problem and use of Pesticides

1. Plant Protection – Principles and Practices – S. B. Chotopadhyay
2. Plant Protection in India – D. Bap Reddy and N. O. Joshi
3. Plant Diseases – R. S. Singha, Oxford & IBM Pub. Co.
4. Plant Pathology – R. S. Malhotra, MCGraw Hill Pub.

5. Grop Pests and how to fight them: Directorate of Publicity Govt. of Maharashtra.

Agricultural machineries & Implements and Irrigation Management

1. Principles of Agricultural Engineering – A. M. Michael & Ojha
2. Farm Tractor – repair & maintenance – Jain and Rai
3. Elements of Agricultural Engineering – Jagadeswar Sahey
4. Irrigation Theory and Practice – A. M. Michael
5. Manual of irrigation agronomy – R. D. Mishra & M. Ahmed
6. Design of minor irrigation and canal structure – C. Satyanarayan Murty
7. Efficient Farm Management of irrigation water – S. S. Prihar, B. S. Sandhy, M. P. Kausal & M. S. Bajwa
8. Water quality for Agriculture – R. S. Ayer & DW Westcat.
9. Irrigation and Drainage – FAO, Paper-29.

Post-harvest Management and Food Processing

1. Handline and Storage of food grains – D. W. Hall
2. Post Harvest Technology of Cereals, Pulses & Oilseeds – Amalendu Chakravarty
3. Preservation of Fruits & Vegetables – G. S. Lal, G. S. Siddappa, NCL Tendor ICAR, New Delhi.
4. Homemade Processing & Preservation of fruits and vegetables – CETR Mysore.
5. Food Science – W. Potter, CBS Publisher & Distributors.