



BANGLADESH TECHNICAL EDUCATION BOARD
AGARGAON , DHAKA-1207.

4-YEARS DIPLOMA IN AGRICULTURE CURRICULUM
COURSE STRUCTURE & SYLLABUS
(PROBIDHAN-2022)

CURRICULUM CODE: 23

FOURTH SEMESTER
(Effective from 2021-2022 Academic Sessions)

DIPLOMA IN AGRICULTURE (23)

SYLLABUS

PROBIDHAN-2022

4th SEMESTER

SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
22341	Soil Science-II (মৃত্তিকা বিজ্ঞান-২)	T	P	C
		2	3	3

Rationale	<p>This course is designed to provide students' knowledge and skills on concept of land, land evaluation, land use planning, sustainable land management, Agro-Ecological Zones (AEZ) of Bangladesh, soil fertility evaluation and fertilizer recommendation. This course will also enrich students' knowledge and skills on fertilizer management, soil organic matter, soil survey, soil mapping, using upazilla nirdeshika, characteristics of submerged, problematic soils and their management. This course will develop students' analytical and problem solving skills and students can solve various soil related agricultural problems.</p>
Learning Outcomes (Theoretical)	<p>After undergoing the subject, students will be able to</p> <ol style="list-style-type: none">1. Describe concept of land, land evaluation and land capability classification2. Explain land use planning and sustainable land management for appropriate use of land3. Illustrate locations, area, present land use, soil characteristics and ecological hazards of different AEZs of Bangladesh4. Evaluate soil fertility problems for recommendation5. Describe principles and methods of fertilizer application6. Explain the characteristics and importance of soil organic matter, humus and clay colloids7. Explain the methods of soil survey, soil mapping and uses of upazilla nirdeshika8. Describe the characteristics and management of submerged soil9. Explain the characteristics and management processes of different problematic soils10. Discuss the causes of soil pollution and effects on food quality
Learning Outcomes (Practical)	<p>After undergoing the subject, students will be able to</p> <ul style="list-style-type: none">• Select suitable crop and cropping pattern for a specific area of land (Ex. 1)• Identify different Agro-Ecological Zones from AEZ map (Ex. 2)• Identify plant nutrient deficiency symptoms by visual observation (Ex. 3)• Determine N, P and K in soil by using rapid testing kit box (Ex. 4)• Use Fertilizer Recommendation Guide (FRG) for fertilizer calculation (Ex. 5)• Practice different methods of fertilizer application (Ex. 6)• Conduct soil survey, preparation of survey report and soil map (Ex. 7)• Use Upazilla Nirdeshika Guide and Upazilla Land Map for identifying land type (Ex. 8)• Identify problematic soils (Ex. 9)• Identify Soil Pollutants (Ex. 10)

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1	<p>Concept of Land and Land Evaluation</p> <p>1.1 Define land 1.2 Distinguish between land and soil 1.3 Describe the concept of land evaluation 1.4 Describe different land types 1.5 Describe different criteria and methods of land evaluation 1.6 Illustrate land capability classification 1.7 Describe the characteristics of land capability classes and subclasses</p>	3	6
2	<p>Land Use Planning and Sustainable Land Management</p> <p>2.1 Describe importance of land use planning 2.2 Describe crop selection by considering different properties of soil and land 2.3 Describe a crop production plan by using land, soil and suitable crop 2.4 Explain main factors for implementation of land use planning 2.5 State the concept of sustainable land management (SLM) 2.6 Discuss the sustainable land use system 2.7 State the land suitability for fish, forest plant and crop cultivation</p>	3	5
3	<p>Agro-Ecological Zones (AEZ) of Bangladesh</p> <p>3.1 State the criteria of AEZ classification of Bangladesh 3.2 Name the AEZs of Bangladesh 3.3 Describe the soil characteristics of important AEZs of Bangladesh 3.4 Describe locations, area, present land use, soil fertility status and ecological hazards of different AEZs of Bangladesh</p>	4	7
4	<p>Soil Fertility Evaluation and Fertilizer Recommendation</p> <p>4.1 Narrate the concept of soil fertility evaluation 4.2 Enlist the methods of soil fertility evaluation 4.3 Describe the steps of soil collection and preservation for analysis 4.4 Explain the methods of N, P, K and pH analysis 4.5 Calculate the AEZ basis fertilizer dose for a specific crop by using fertilizer recommendation guide (FRG) 4.6 Calculate the soil test basis fertilizer dose for a specific crop by using fertilizer recommendation guide (FRG)</p>	4	7
5	<p>Soil and Fertilizer Management</p> <p>5.1 State the principles of fertilizer application in soil 5.2 List the methods of fertilizer application 5.3 Describe different methods and time of fertilizer application in soil for different crop production 5.4 Illustrate foliar application of fertilizer in crops 5.5 Describe integrated nutrient management (INM) for crop production 5.6 Discuss the basic logic of fertilizer application in different cropping pattern 5.6 Explain the way of increasing fertilizer use efficiency</p>	4	7
6	<p>Soil Organic Matter, Humus and Clay Colloids</p> <p>6.1 Define soil organic matter 6.2 Write down the sources and composition of soil organic matter 6.3 Describe the effects of soil organic matter on soil properties 6.4 Explain the causes of soil organic matter depletion in Bangladesh soil 6.5 Describe the ways of organic matter replenishment in soil 6.6 Define clay and humus 6.7 Describe the characteristics of humus and clay colloids</p>	3	6

	6.8 Describe the significance of C:N ratio of organic matter		
7	Soil Survey, Mapping and Upazilla Nirdeshika 7.1 Define soil survey 7.2 Describe the purpose of soil survey 7.3 List the methods of soil survey 7.4 Describe the methods of soil survey 7.5 Describe soil survey report preparation 7.6 Illustrate the process of soil map preparation by using survey data 7.7 Explain the use of Upazilla Nirdeshika Guide and Upazilla Land Map 7.8 Describe the uses of Geological Information System (GIS) in soil survey and mapping	3	6
8	Management of Submerged Soils 8.1 Define submerged soil 8.2 Mention the characteristics of submerged soil 8.3 Mention the plant nutritional problems in wetland crop cultivation in Bangladesh 8.4 Describe the remedial measures of plant nutritional problems of wetland crops cultivation in Bangladesh 8.5 Describe problems and management of waterlogged rice cultivated soil	2	4
9	Problematic Soils of Bangladesh 9.1 Define problematic soil 9.2 List problematic soils of Bangladesh 9.3 Describe the causes of salinity development in Bangladesh soil 9.4 Classify soil and water according to salinity levels 9.5 Describe the problems and management of saline, acidic, char land and hill soils 9.6 Explain the problems and management of acidic soil 9.7 Describe the problems and management of hill soil 9.8 Describe the problems and management of char lands	3	6
10	Soil and water Pollution 10.1 Discuss soil pollution 10.2 List the soil pollutants 10.3 Describe the causes of soil and water pollution 10.4 Describe the effects of soil and water pollution on plants 10.5 Describe management of polluted soil and water 10.6 Explain the effects of soil and water pollution on food quality	3	6
	Total	32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Continuous Marks
1	<p>Select suitable crop and cropping pattern for a specific area of land</p> <p>1.1 Select crop and cropping pattern for a specific area of land by considering different factors</p> <p>1.2 Maintain the record of performed task</p>	1	2
2	<p>Identify different Agro-Ecological Zones from AEZ map</p> <p>2.1 Collect AEZ map</p> <p>2.2 Identify different Agro-Ecological Zones from AEZ map</p> <p>2.3 Maintain the record of performed task</p>	1	2
3	<p>Identify plant nutrient deficiency symptoms by visual observation</p> <p>3.1 Observe field crops for identifying nutrient deficiency symptoms</p> <p>3.2 Identify nutrient deficiency symptom</p> <p>3.3 Maintain the record of performed task</p>	2	3
4	<p>Determine N, P and K in soil by using rapid testing kit box</p> <p>4.1 Determine N, P and K in soil</p> <p>4.2 Interpret the data by using soil test value interpretation class</p> <p>4.3 Use the formula of FRG for fertilizer calculation</p> <p>4.4 Calculate fertilizer requirement by using soil test value for a specific crop</p> <p>4.5 Maintain the record of performed task</p>	2	3
5	<p>Use Fertilizer Recommendation Guide (FRG) for fertilizer calculation</p> <p>5.1 Apply soil test value interpretation (STVI) class, crops fertilizer recommendation class and formula of FRG for soil test basis fertilizer calculation</p> <p>5.2 Calculate fertilizer requirement for crops by soil test basis</p> <p>5.3 Determine fertilizer requirement for crops by AEZ basis</p> <p>5.4 Maintain the record of performed task</p>	2	3
6	<p>Practice different methods of fertilizer application</p> <p>6.1 Practice broadcast, localized and deep placement of fertilizer application</p> <p>6.2 Demonstrate foliar application of fertilizer application</p> <p>6.4 Maintain the record of performed task</p>	2	3
7	<p>Conduct soil survey, preparation of survey report and soil map</p> <p>7.1 Practice soil survey</p> <p>7.2 Prepare soil survey report</p> <p>7.3 Study different kinds of soil maps</p> <p>7.4 Apply Upazila Nirdeshika for agricultural production</p> <p>7.5 Maintain the record of performed task</p>	1	3
8	<p>Use Upazilla Nirdeshika Guide and Upazilla Land Map for identifying land type</p> <p>8.1 Collect Upazilla Nirdeshika Guide</p> <p>8.2 Identify different land types by using Upazilla Nirdeshika Guide</p> <p>8.3 Maintain the record of performed task</p>	2	2
9	<p>Identify problematic soil</p> <p>9.1 Collect problematic soils</p> <p>9.2 Determine physical and chemical properties of problematic soils</p> <p>9.3 Maintain the record of performed task</p>	2	2

10	Identify Soil Pollutants 10.1 Visit polluted soil area 10.2 Identify different soil pollutants 10.3 Apply remedial measures to reduce soil pollution 10.4 Maintain the record of performed task	1	2
Total		16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENTS AND MACHINERY)

Sl.	Item Name	Quantity
01	Auger, spade, mortar and pestle, sieve, core sampler, soil map, upazilla nirdeshika, rapid soil testing kit, practical note book, fertilizer recommendation guide, scale, pencil, eraser	

Required Chemicals:

Sl.	Item Name (Consumables Materials)	Quantity
01	Hydrochloric acid, fertilizers, manure etc	

RECOMMENDED BOOKS:

Sl.	Book Name	Writer Name	Publisher Name & Edition
01	The nature and properties of soils	Nyle C. Brady Ray R. Weil	Pearson publications Sixteenth Edition
02	Introductory Soil Science	Dilip Kumar Das	Kalyani Publishers Fourth Edition
03	Adhunik Mrittika Biggan	Prof. Dr.Md. Sadrul Amin	Mowla Brothers
04	Fertilizer Recommendation Guide-2018	Published by Bangladesh Agricultural Research Council www.barc.gov.bd	Priyanka Printing and Publications

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SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
		T	P	
22342	Mensuration and Statistics (পরিমিতি ও পরিসংখ্যান)	2	3	C
				3

Rationale	Mensuration and Statistics is very important disciplines of agricultural science. This course is designed to teach students about the concept of data, its collection, organization, analysis, presentation, and drawing statistical inferences regarding agricultural information. So knowledge of Statistics is pre-requisite for diploma in agriculture and livestock. This course will develop students' knowledge, analytical skills and attitude. Students can solve various statistical problems by applying the latest technologies.
Learning Outcomes (Theoretical)	<p>After undergoing the subject, students will be able to</p> <ul style="list-style-type: none"> ▪ Interpret mensuration ▪ Define square, rectangle, triangle, parallelogram, rhombus, trapezium, circle, ellipse, cone, pyramid, cylinder and sphere ▪ Interpret statistics, population, sample and sampling ▪ Organize the data into a table or chart ▪ Interpret graphical methods for bar diagram, histograms, frequency curve, ogive and pie chart ▪ Calculate measures of central tendency for different types of variables ▪ Interpret summary statistics for summarizing data sets of measures of central tendency ▪ Calculate measures of variability ▪ Interpret summary statistics for summarizing data sets of measures of dispersion ▪ Identify relationship between two variables from a scatter plot ▪ Interpret correlation coefficient and regression coefficient ▪ Interpret basic principles of experimental design ▪ Interpret the methods of analysis of basic experimental designs ▪ State the strategy in planning and conducting experiments ▪ Analyze data and interpret experimental results in agriculture ▪ Derive meaningful information from the data ▪ Describe official statistics of Bangladesh
Learning Outcomes (Practical)	<p>After undergoing the subject, students will be able to</p> <ul style="list-style-type: none"> ▪ Construct and interpret frequency distribution for summarizing data sets ▪ Demonstrate graphical methods for summarizing data sets ▪ Calculate measures of central tendency. ▪ Interpret and explore summary statistics for summarizing data sets. ▪ Calculate measures of variability. ▪ Apply appropriate methods for summarizing a data ▪ Interpret scatter diagram for bivariate data ▪ Illustrate the linear relationship of variables ▪ Interpret the results of regression methods for the analysis of data ▪ Develop an experimental design for testing the proposition and a making conclusion.

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1	Mensuration 1.1 Define mensuration 1.2 Explain the necessity of mensuration 1.3 Define square, rectangle, triangle, parallelogram, rhombus and trapezium 1.4 Define circle, ellipse, cone, pyramid, cylinder and sphere	3	5
2	Statistics, Population and Sample 2.1 Define statistics 2.2 Explain the necessity of statistics 2.3 Describe the role of statistics in various field of agriculture 2.4 Define population, sample, parameter and statistic 2.5 Distinguish between parameter and statistic 2.6 Define variable 2.7 Classify variable 2.8 Define sampling, sampling unit and sampling frame 2.9 Classify sampling techniques based on underlying assumptions	4	8
3	Scales of Measurement 3.1 Define scales of measurement 3.2 Describe the necessity of scales of measurement 3.3 Classify the scales of measurement 3.4 Define nominal scales 3.5 Define ordinal scales 3.6 Define interval scales 3.7 Define ratio scales	2	5
4	Frequency Distribution and Graphical Representation 4.1 Define data, frequency, cumulative frequency, frequency distribution 4.2 Define graph, histogram, bar diagram, ogive, frequency polygon and pie chart 4.3 Describe the steps involved in the construction of a frequency distribution 4.4 State the representation of frequency distribution using charts and diagrams	4	10
5	Central Tendency 5.1 Define central tendency 5.2 Describe the necessity of central tendency 5.3 State the ideal characteristics of central tendency 5.4 Define arithmetic mean, geometric mean, harmonic mean, median and mode with algebraic formula 5.5 Describe the relationship among mean, median and mode 5.6 State the advantages and disadvantages of mean, median and mode 5.7 Examine the applications of mean, median and mode in agricultural aspects		7
6	Dispersion 6.1 Describe dispersion 6.2 Mention the necessity of dispersion 6.3 List the measures of dispersion 6.4 Define range, mean deviation, quartile deviation and standard deviation 6.5 Define coefficient of range, coefficient of mean deviation, coefficient of	3	5

	quartile deviation and coefficient of variation 6.6 Describe the uses of relative measures of biological investigation		
7	Correlation Analysis 7.1 Define correlation and correlation coefficient 7.2 Illuminate the necessity of correlation 7.3 State the various types of correlation 7.4 Mention the properties of the correlation coefficient 7.5 Point out the application of correlation in agriculture	3	5
8	Regression Analysis 8.1 Define regression and regression coefficient 8.2 Elucidate the necessity of regression 8.3 Describe regression lines 8.4 Mention the types of regression 8.5 State the properties of regression coefficient 8.6 Mention the uses of regression in agriculture 8.7 Distinguish between correlation and regression	3	5
9	Design of Experiment 9.1 Define design of experiment 9.2 State the basic principles of experimental design 9.3 Mention the necessity of design of experiment 9.4 Define replication, randomization and local control 9.5 Discuss completely randomized design (CRD) with layout and linear model 9.6 State the advantages and disadvantages of CRD 9.7 Mention the uses of CRD 9.8 Describe randomized block design (RBD)	4	8
10	Official Statistics in Bangladesh 10.1 State the importance of official statistics in Bangladesh 10.2 Discuss primary and secondary sources of data 10.3 Illustrate the main sources of official statistics 10.4 Mention the limitation of official statistics	2	2
	Total	32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Continuous Marks
1	Calculate Mensuration 1.1 Compute areas of square and rectangle 1.2 Calculate areas of triangle, cone and cylinder 1.3 Maintain the record of performed task	2	3
2	Construct Frequency Distribution 2.1 Construct a frequency distribution from raw data 2.2 Represent graphically bar diagram, histogram, frequency polygon and ogive 2.3 Maintain the record of performed task	2	3
3	Calculate Central Tendency 3.1 Calculate measures of central tendency (mean, median, mode) from grouped and ungrouped data	2	3

	3.2 Verify the median and modal value graphically 3.3 Maintain the record of performed task		
4	Compute mean and standard deviation of Dispersion 4.1 Compute mean deviation 4.2 Compute standard deviation, and 4.3 Maintain the record of performed task	1	2
5	Compute coefficient of variation 5.1 Compute coefficient of variation from the frequency distribution 5.2 Maintain the record of performed task	1	2
6	Compute Correlation Analysis 6.1 Compute and interpret correlation coefficient 6.2 Maintain the record of performed task	2	3
7	Compute Regression Analysis 7.1 Compute intercept, 7.2 Compute regression coefficient, and 7.3 Fit a regression line of y on x 7.4 Maintain the record of performed task	2	3
8	Apply Completely Randomized Design (CRD) 8.1 Analyze completely randomized design 8.2 Maintain the record of performed task	2	3
9	Randomized Block Design (RBD) 9.1 Analyze randomized block design 9.2 Maintain the record of performed task	2	3
	Total	16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

Sl.	Item Name	Quantity
01	Computer, calculator, graph paper, ruler, pencil box, note book and mathematical instrument	

Required Software:

Sl.	Item Name (Consumables Materials)	Quantity
01	Statistical package for the social sciences (SPSS)	

RECOMMENDED BOOKS:

Sl.	Book Name	Writer Name	Publisher Name & Edition
01	পরিমিতি ও পরিসংখ্যান	মোঃ মাসউদুজ্জামান ও ড. মোঃ মতিয়ার রহমান	
02	উচ্চ মাধ্যমিক পরিসংখ্যান (১ম খন্ড)	এ কে আজাদ	
03	পরিমিতি ও পরিসংখ্যান	নিরেন্দ্র নাথ পাল ও হেরশ্ব কুমার রায়	
04	উচ্চ মাধ্যমিক পরিসংখ্যান (১ম খন্ড)	ড. মনিন্দ্র কুমার রায়	
05	উচ্চ মাধ্যমিক পরিসংখ্যান (১ম খন্ড)	মোঃ খিজির হায়াত খান, নুরনবী মানিক, মোঃ মিজানুর রহমান ও ফিলিপ চার্লস সরকার	

Prepared by

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SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
		T	P	
22343	Forest and Forestation (বন ও বনায়ন)	2	3	3

Rationale	<p>Bangladesh is a disaster prone country with limited forest resources. A country needs 25% forest area to keep a country sustainable to natural disaster. But we have only 17.15% forest coverage. In forest sector major components are of trees, shrubs, woods and non-woods forest produces, various animals which sustain the forest coverage. So diploma level students should have to learn the area and coverage of forest in Bangladesh, its input to meet peoples need and also to keep environment for sustainable development of Bangladesh. The student will be able to learn mapping of forest, find out forest resources and their uses, forest measurement, social forestation and its benefit sharing mechanism and causes and remedies of forest destruction. Consequently after completion of this course, the student will be able to explore the acquired knowledge in their personal, real and professional life</p>
Learning Outcomes (Theoretical)	<p>After undergoing the subject, students will be able to</p> <p>Describe the concept and various resources of forest Describe the importance and necessities of forest Discuss the weather and climatic effects on forest development and forest degradation Classify forest land based on ecology Describe the forest mensuration and its classification Define nursery and describe nursery components and layout Describe forest tree species based on their silvan features Explain social forestry program and benefit sharing mechanism Recognize forest act and policy State objectives of Bangladesh Forest Policy</p>
Learning Outcomes (Practical)	<p>After undergoing the subject, students will be able to</p> <ol style="list-style-type: none"> 1. Draw a forest map of Bangladesh 2. Identify the forest produces 3. Draw the silvan features of forest tree species 4. Prepare a layout of the forest nursery 5. Perform training, pruning, pollarding, coppicing and lopping of forest tree 6. Compute benefit sharing mechanism of social forestry 7. Calculate forest area based on mensuration 8. Perform germination test of forest seed in a laboratory 9. Demonstrate seedling/sapling production techniques 10. Visit forest areas and record the forest resources

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1	Introduction to Forest and Forestation 1.1 Define forest and forestation 1.2 State the scope and importance of forest and forestation 1.3 Describe the objectives of studying forest and forestation 1.4 Define afforestation, reforestation, deforestation and forest degradation 1.5 Illustrate the phases of forest development	4	5
2	Classification and Coverage of Forest 2.1 Classify Bangladesh forest based on ecological factors 2.2 Mention the location, distribution climate and species composition of different forests in Bangladesh 2.3 State the importance of plants and animals in forest development 2.4 Illustrate forest types in Bangladesh map	3	4
3	Forest Produces/ Resources of Bangladesh 3.1 Discuss various types of forest produces/ resources 3.2 Mention the importance of timber and non-timber forest resources 3.3 Define logging 3.4 Discuss various types of logging 3.5 Illustrate the importance of forest logging	3	6
4	Forest Mensuration 4.1 Define forest mensuration 4.2 Classify various types of forest mensuration of Bangladesh 4.3 Mention importance of forest mensuration 4.4 Describe various forest mensuration techniques	2	4
5	Silvan Features of Forest Tree Species 5.1 Define silvan feature 5.2 Define crown, bole, crown form, canopy, branching pattern of trees, foliage and phenology of forest tree species 5.3 Describe seedling, sapling pole and tree 5.4 Describe silvan features of Neem, Jackfruit, Koroi, Sal, Sundori, Segun and Mahogani	4	8
6	Forest Nursery and Nursery Management 6.1 Define nursery 6.2 Mention scope and importance of forest nursery 6.3 Classify forest nursery 6.4 Discuss the site selection criteria of forest nursery 6.5 Draw a layout of an ideal forest nursery 6.6 Discuss management of forest nursery 6.7 Illustrate various methods of seed collection of different forest trees seeds/fruits 6.8 Discuss the storing methods of different forest trees seeds/fruits 6.9 Describe seedling production techniques of Mahogani, Accacia, Sal and Segun	5	8
7	Homeyard, Dam, Roadside Plantation and Nursing Techniques 7.1 List major trees suitable for homeyard, roadside and dam plantation 7.2 Mention site selection criteria for tree plantation 7.3 Describe plantation techniques and nursing of homeyard, dam and roadside trees 7.4 Describe production technology of Ipil-Ipil, Sisso, Drumstick, Mahogany, Bamboo and Raintree	4	8

8	Social Forestation 8.1 Define social forestation 8.2 State the objectives of social forestation 8.3 Describe scope and importance of social forestation 8.4 Discuss environmental, social and cultural benefits of social forestation 8.5 Describe benefit sharing mechanism of social forestation in roadsides, croplands and forests	3	7
9	Deforestation 9.1 Describe the natural and manmade causes of deforestation 9.2 Mention the statistics of deforestation in Bangladesh 9.3 Describe the effect of deforestation on environment 9.4 Discuss the remedies of deforestation	2	6
10	Forest Act and Policies of Bangladesh 10.1 Differentiate forest act and policies of Bangladesh 10.2 State objectives of Bangladesh forest policy 10.3 Describe recent forest policies in Bangladesh 10.4 Illustrate principles of forest policies of Bangladesh 10.5 State different institutions and organizations related to forest	2	4
Total		32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Name of Experiments with Procedure	Class (3 Period)	Continuous Marks
1	Draw Forest Map 1.1 Identify different locations of forest in Bangladesh 1.2 Draw a map of Bangladesh mentioning forest types 1.3 Maintain the record of perform job	1	2.5
2	Identify Forest Produces 2.1 List various forest produces 2.2 Demonstrate various logging techniques 2.3 Maintain the record of perform job	1	2.5
3	Practice Forest Mensuration 3.1 Identify forest mensuration techniques 3.2 Perform at least one forest mensuration technique 3.3 Maintain the record of perform job	1	2.5
4	Draw Silvan Features of Forest Tree Species 4.1 Draw and interpret crown, bole, branching pattern, foliage, seedlings and saplings 4.2 Draw and identify silvan features of Neem, Jackfruit, koro, Sal, Sundori, Segun and Mahogani 4.3 Maintain the record of perform job	2	2.5
5	Draw Forest Nursery and Nursery Management 5.1 Draw and layout an ideal nursery 5.2 Record the storing techniques of forest fruits and seeds 5.3 Maintain the record of perform job	2	2.5

6	Visit nursery and Prepare Report 6.1 Select and visit a nursery 6.2 Prepare a report based on various nursery components 6.3 Maintain the record of perform job	2	2.5
7	Apply Various Tree Seed Collection Methods and Perform Germination Test 7.1 Practice various tree seed collection methods 7.2 Perform seed germination test 7.3 Maintain the record of perform job	2	2.5
8	Apply Various Forest Seedlings Production Techniques 8.1 Procedure of seedling production techniques in seedbed and polybag 8.2 Perform the seedling production techniques of Mahogani, Accasia, Sal, Segun 8.3 Maintain the record of perform job	2	2.5
9	Perform Tree plantation and Management Techniques 9.1 Perform plantation techniques of Ipil-ipil/Sisso/Drumstick/ Mahogany/ Bamboo/ Raintree 9.2 Perform various management techniques including training, pruning, copping, pollarding, lopping 9.3 Maintain the record of perform job	1	2.5
10	Visit Social Forestation 10.1 Visit the various social forestation project/program 10.2 Calculate benefit sharing mechanism (BSM) of social forestation in roadsides, cropland and forest 10.3 Maintain the record of perform job	2	2.5
	Total	16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

Sl.	Item Name	Quantity
01	Map of Bangladesh, spade, nirani, mortar and pestle, sieve, core sampler, pruning sheare, secature, measuring tape, Petridish, bloting paper, polybag, seed, seedling etc.	

RECOMMENDED BOOKS:

Sl.	Book Name	Writer Name	Publisher Name & Edition
01	Forest mensuration and biometry	L.S. khanna , A.N. Chaturvedi	Sanskriti press
02	বাংলাদেশের বন ও বনাঞ্চল	তপন চক্রবর্তী	দিব্য প্রকাশ
03	Introduction to Forests and Renewable Resources	<u>John C. Hendee</u>	Waveland Press

Prepared by:

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- Mst. Salma Akter, Assistant Exam Controller (Textile & Agriculture), Bangladesh Technical Education Board, Dhaka

SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
		T	P	
22344	Cultivation of Fruits (ফল চাষ)	3	3	4

Rationale	This course is intended to teach students about fruit trees, their importance and contributions, orchard planning, fruit cultivation methods, intercultural operations, the production and management of roof fruit trees, fruit collection, sorting, storage, and marketing. Following that, students can apply their knowledge in real world situations.
Learning Outcomes (Theoretical)	<p>After undergoing the subject, students will be able to</p> <ul style="list-style-type: none"> • Define and classify fruit • Describe fruit cultivation in Bangladesh • Describe geographical distribution of fruit crops • Illustrate fruit planting/fruit gardening/orchard • State soil nutrition, irrigation and intercultural operation of fruit crops • Explain propagation of Fruit crops • Describe Production technology of Mango, Litchi, Jackfruit • Describe Production technology of Coconut, Banana, pineapple • Describe Production technology of Guava, Hog palm, Jujube • Describe Production technology of Papaya, Watermelon and Sapota • Explain citrus fruit cultivation • Describe Production technology of prospectus fruits • Describe minor fruits • Describe use plant growth regulator on fruit plant • Illustrate postharvest technology of fruits
Learning Outcomes (Practical)	<p>After undergoing the subject, students will be able to</p> <ul style="list-style-type: none"> • Practice orchard planning and design for different fruit plants. • Prepare layout, Pit and manuring for different fruit plants • Practice cultivation techniques (Mango, BARI Malta 1, Banana, Dragon) pest, disease and control methods • Determine sex of papaya plant • Practice pruning and training of fruit plants • Apply insecticides and fungicides for fruit trees • Practice ring irrigation method for fruit trees

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1	Introduction to fruit 1.1 Define fruit 1.2 List cultivated important fruits in Bangladesh 1.3 List common name, English name, scientific name and family of major fruits 1.4 Classify fruit 1.5 State simple fruit, aggregate fruit and multiple fruit 1.6 Describe the nutritional importance of fruit 1.7 Mention different growing season of fruit	2	4
2	Fruit cultivation in Bangladesh 2.1 Describe the economic importance of fruit cultivation 2.2 Mention current status of total fruit production in Bangladesh 2.3 Mention current status of cultivated land under fruit cultivation in Bangladesh 2.4 List the problems of fruit production in Bangladesh 2.5 Explain the solution of problems of fruit production in Bangladesh 2.6 Describe the scope and prospects of fruit cultivation in Bangladesh 2.7 Mention the steps taken by government for increasing fruit production	3	6
3	Geographical distribution of fruit crops 3.1 Mention geographical effect on production of fruit 3.2 List major fruit growing regions of the world 3.3 Describe climatic feature of major fruit growing regions in the world 3.4 List distribution of fruit plants of major fruit growing regions in the world 3.5 List distribution of major fruit growing regions in Bangladesh	3	6
4	Fruit planting/ Fruit gardening/orchard 4.1 Define orchard 4.2 Describe the planning to establish fruit orchard 4.3 Discuss site selection procedure for fruit cultivation 4.4 Classify and Describe suitable land for fruit cultivation 4.5 Discuss landscaping for establishing an orchard 4.6 List different design of fruit orchard 4.7 Describe hexagonal, triangular, square, rectangular and quincunx planting system 4.8 Describe preparation procedure of pit, fertilization and planting 4.9 Discuss fruit cultivation in rooftop	3	6
5	Fertilization, irrigation and intercultural operation of fruit 5.1 List importance of applying fertilizer in fruit plant 5.2 Explain fertilizer and manure applying procedure in fruit crops 5.3 Describe importance of irrigation and drainage in fruit plant 5.4 Explain different irrigation and drainage systems in fruit crops 5.5 List the steps of intercultural operation in fruit plant 5.6 Discuss importance of pruning and training in orchard 5.7 Define unfruitfulness 5.8 List the causes of unfruitfulness 5.9 Explain remedial measures for unfruitfulness	3	6
6	Propagation of Fruit crops 6.1 Classify fruit propagation 6.2 List the sexually and vegetatively propagated fruit plant 6.3 Describe sexual propagation of fruit plant 6.4 Describe vegetative propagation of fruit plant 6.5 Define cutting, layering, grafting and budding 6.6 Discuss micro propagation in fruit plants	3	6

7	<p>Production technology of Mango, Litchi and Jackfruit</p> <p>7.1 Describe Mango production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>7.2 Describe Litchi production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>7.3 Describe Jackfruit production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p>	4	8
8	<p>Production technology of Coconut, Banana, Pineapple</p> <p>8.1 Describe Coconut production technology based on economic and nutritional importance, climate, varieties, propagating materials, land and soil, land preparation, planting time, planting method, intercultural operation, harvesting and yield</p> <p>8.2 Describe Banana production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>8.3 Describe Pineapple production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p>	4	8
9	<p>Production technology of Guava, hog palm, Jujube</p> <p>9.1 Describe Guava production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>9.2 Describe Hog palm production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>9.3 Describe Jujube production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p>	4	6
10	<p>Production technology of Papaya, Watermelon and Sapota</p> <p>10.1 Describe Papaya production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>10.2 Describe Watermelon production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p> <p>10.3 Describe Sapota production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield</p>	3	6

11	Citrus Fruit Cultivation 11.1 Define citrus fruit 11.2 List major citrus fruit 11.3 Describe the nutritional importance of citrus fruit 11.4 Describe BARI Malta-1 production technology based on Climate, Land and soil, Land preparation, Planting materials, Planting time, Planting method, Intercultural operation, harvesting and yield 11.5 Describe Mandarin production technology based on Climate, Land and soil, Land preparation, Planting materials, Planting time, Planting method, Intercultural operation, harvesting and yield 11.6 Describe 'Colombo lebu' production technology based on Climate, Land and soil, Land preparation, Planting materials, Planting time, Planting method, Intercultural operation, harvesting and yield	3	4
12	Prospectus fruit cultivation 12.1 List prospectus fruits of Bangladesh 12.2 Describe Dragon fruit production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield 12.3 Describe Strawberry production technology based on Economic and nutritional importance, Climate, Varieties, Propagating materials, Land and soil, Land preparation, Planting time, Planting method, Intercultural operation, harvesting and yield	4	8
13	Minor fruit cultivation 13.1 List minor fruits cultivation in Bangladesh 13.2 Describe prospects and cultivation of Lotkan in Bangladesh 13.3 Describe prospects and cultivation of Fig in Bangladesh 13.4 Describe prospects and cultivation of Water chestnut in Bangladesh	3	4
14	Use of plant growth regulator in fruit cultivation 14.1 Define plant growth regulator (PGR) 14.2 Classify plant growth regulators 14.3 Describe the importance of plant growth regulators in fruit production 14.4 Discuss the different methods of plant growth application in different fruit plants.	3	4
15	Postharvest management of fruit 15.1 Define maturity indices of fruits 15.2 Discuss the maturity indices of major fruits 15.3 List the factors affecting shelf life of fruits 15.4 Describe the grading and packaging of fruits 15.5 Discuss the transporting and marketing of fruits 15.6 List the storage system for fruits 15.7 Describe the effect of artificial fruit ripening on human health	3	8
	Total	48	90

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Continuous Marks
1	Plan an orchard 1.1 Select an appropriate design based on land size 1.2 Draw a layout to prepare orchard 1.3 Maintain the record of performed task	1	2.5
2	Prepare pit and planting of seedling/sapling in orchard 2.1 Prepare a pit according to selected plant 2.2 Apply manure and fertilizer in pit 2.3 Plant the seedling/sapling in pit 2.4 Maintain the record of performed task	2	2.5
3	Practice cultivation procedure of Mango plant 3.1 Select the healthy sapling 3.2 Plant the selected sapling 3.3 Practice intercultural operation 3.4 Maintain the record of performed task	1	2.5
4	Practice cultivation of BARI Malta-1 4.1 Select the healthy sapling 4.2 Plant the selected sapling 4.3 Practice intercultural operation 4.4 Maintain the record of performed task	2	2.5
5	Practice cultivation of Banana 5.1 Select the healthy sapling 5.2 Plant the selected sapling 5.3 Practice intercultural operation 5.4 Maintain the record of performed task	2	2.5
6	Practice cultivation of Dragon fruit 6.1 Select the healthy sapling 6.2 Plant the selected sapling 6.3 Practice intercultural operation 6.4 Maintain the record of performed task	2	2.5
7	Determine sex of papaya plant 7.1 Identify the papaya plant based on sex 7.2 Identify male and female flower 7.3 Draw and label of male and female flower of papaya plant 7.4 Maintain the record of performed task	2	2.5
8	Practice training and pruning methods of different fruit trees 8.1 Select the fruit plant for training and pruning 8.2 Practice training and pruning of selected fruit plant 8.3 Maintain the record of performed task	2	2.5
9	Practice ring irrigation method for fruit trees 9.1 Determine the irrigation time for selected plant 9.2 Practice the ring irrigation method for selected fruit plant 9.3 Maintain the record of performed task	1	2.5
10	Apply insecticides and fungicides for fruit trees using foot pump sprayer 10.1 Select the appropriate insecticide and fungicide for fruit plant 10.2 Apply insecticide and pesticide for selected fruit plant 10.3 Maintain the record of performed task	1	2.5
	Total	16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

SI	Item Name	Quantity
01	Paper, Pencil, Measuring scale, Spade, Hoe, Fertilizer, Manure, Seedling/sapling, Pruning shears, Secateurs, Insecticides, Pesticides, Foot pump sprayer, Apron, Hand gloves etc.	As per need

RECOMMENDED BOOKS:

SI	Book Name	Writer Name	Publisher Name & Edition
01	A Handbook of Fruit Production	S. Prasad and U Kumar	Agrobios
02	Introduction to Fruit Crops	Mark Rieger	CRC Press

Prepared by:

- Dr. Jasim Uddain, Professor, Department of Horticulture, Sher-e-Bangla Agricultural University, Dhaka
- Ahmed Ali Chowdhury (Iqbal), Director (Training), Bangladesh Seed Association, Dhaka
- Jasmin Akter, Additional Agriculture Officer (attached officer), Agriculture Training Institute, Dhaka
- Rupok Kanti Biswas, Curriculum Specialist (Diploma), Bangladesh Technical Education Board, Dhaka

SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
22345	Fundamental and Ecological Entomology (মৌলিক ও বাস্তুসংস্থান কীটতত্ত্ব)	T	P	C
		2	3	3

Rationale	<p>Knowledge of insect and mites is crucial for the safeguard of crops in the field during production and storage. This course has been designed to provide students knowledge on importance of insects and mites in Agriculture. Students will gain knowledge on various morphological features like antennae, mouthparts, visual organs, legs, wings and abdominal appendages which will help in classification of insects. They will learn basic information about insect integument, moulting, metamorphosis, endocrine glands and hormones. This course will develop students' knowledge and analytical skills about ecological factors that regulate insect pest population in the field. Students will be able to forecast about incidence of insect pests in the field.</p>
Learning Outcomes (Theoretical)	<p>After undergoing the subject, students will be able to</p> <ol style="list-style-type: none"> 1. Distinguish insects and mites 2. Describe importance of insects and mites in Agriculture 3. Explain different body parts of insects and their appendages 4. Illustrate various types of antennae, mouthparts and compound eyes of insect 5. Explain characteristics and functions of different types of legs and wings 6. Describe moulting, metamorphosis, immature stages and reproduction of insects 7. Discuss characteristics and functions of endocrine glands & hormones of insects 8. Explain diagnostic characteristics and economic importance of insect Orders of agricultural importance 9. Discuss effect of ecological factors on population build of insects in crop field. 10. Elucidate growth forms and polymorphism of insect 11. Interpret surveillance and forecasting techniques and its importance in pest control
Learning Outcomes (Practical)	<p>After undergoing the subject, students will be able to</p> <ol style="list-style-type: none"> 1. Recognize the external body parts of a typical insect 2. Demonstrate the various types of mouthparts of insects 3. Identify the different types of legs of insects 4. Recognize the different types of wings of insects 5. Categorize the insects under different Orders of agricultural importance 6. Preserve of insects for future use 7. Identify the beneficial insects 8. Recognize the different tools for collection insect collection 9. Practice surveillance technique of insect population in crop field 10. Identify the different types of spiders and mites

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1	Concept of Entomology 1.1 Define Entomology 1.2 Mention the characteristics of Arachnida and Insecta 1.3 Distinguish between the insect and mite 1.4 Mention the importance of insects and mites in agriculture	2	4
2	External Morphology of Insects and Mites 2.1 Draw and label different parts of a typical insects 2.2 Draw and label different parts of a typical mites 2.3 Mention the appendages of head, thorax and abdomen 2.4 Illustrate insect integument 2.5 Discuss the functions of integument	2	4
3	Head Appendages of Insect 3.1 Define antenna 3.2 Mention the different parts of antenna 3.3 Illustrate various types of antenna 3.4 State the functions of antenna 3.5 Enumerate different types of mouthparts of insect 3.6 Discuss a typical mouthparts of insect 3.7 Describe various modified mouthparts and feeding mechanisms 3.8 Explain ocelli and compound eyes of insect	4	8
4	Thoracic and Abdominal Appendages of Insect 4.1 Draw and label a typical insect leg 4.2 Describe the characteristics and functions of different types of legs 4.3 Show the structure of a typical wing of insect 4.4 Characterize different modified wings 4.5 State the functions of modified wings 4.6 Discuss prolegs, cerci and genital organs	3	6
5	Moulting, Metamorphosis and Reproduction of Insect 5.1 Define moulting, exuviae and instar of insect 5.2 Illustrate different stages of moulting 5.3 Define metamorphosis 5.4 Explain various types of metamorphosis in insect 5.5 Classify insect larva and pupa 5.6 Define insect reproduction 5.7 Narrate different types of reproduction of insects	4	8
6	Endocrine Glands and Hormones of Insect 6.1 Draw and label the endocrine glands of insect 6.2 Discuss the characteristics and functions of endocrine glands 6.3 Define insect hormone 6.4 Mention the role of hormone in insect growth and metamorphosis	2	4
7	Classification of Insects 7.1 Define classification 7.2 Explain the characteristics of different taxa from Phylum to Division in insect classification 7.3 Describe diagnostic characteristics and importance of the Order	6	12

	Odonata, Orthoptera, Dictyoptera, Dermaptera, Hemiptera, Homoptera, Thysanoptera and Isoptera 7.4 Illustrate the identifying characteristics and economic importance of the Order Lepidoptera, Coleoptera, Diptera and Hymenoptera		
8	Insect Ecology 8.1 Define ecology, insect ecology, ecosystem, agro ecosystem, insect population and population dynamics 8.2 State the component of ecosystem. 8.3 Explain the influence of temperature, humidity, rainfall and light on insects 8.4 State the characteristics of predators and parasitoids 8.5 Illustrate the role of predators and parasitoids on regulation of insect population	4	8
9	Growth Form and Polymorphism 9.1 Define insect growth form 9.2 Explain different growth forms of insect 9.3 Define insect polymorphism 9.4 Classify insect polymorphism 9.5 Discuss various types of insect polymorphism	2	2
10	Surveillance and Forecasting 10.1 Define monitoring and surveillance 10.2 Mention the importance of surveillance in pest control 10.3 Illustrate the various methods of pest surveillance 10.4 Define forecasting 10.5 State the importance of forecasting 10.6 Explain different types of forecasting	3	4
		32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Continuous Marks
1	Recognize tools and methods of insect collection and preservation 1.1 Observe different tools of insect collection 1.2 Use hand net, light trap, pheromone trap, sticky trap for insect collection 1.3 Identify different collection and preservation methods 1.4 Maintain the record of performed task	2	2.5
2	Identify the external body parts of a typical insect of the Orthoptera Order (Grasshopper) 2.1 Collect grasshopper 2.2 Separate the body parts 2.3 Identify the head, thorax and abdomen and its appendages 2.4 Draw and label the separated body parts 2.5 Maintain the record of performed task	1	2.5
3	Collect and identify the chewing, piercing-sucking and rasping-sucking mouthparts 3.1 Collect chewing, piercing-sucking and rasping-sucking mouthparts bearing insects. 3.2 Separate mouthparts from insects 3.3 Identify different parts of their mouthparts	2	2.5

	3.4 Draw and label the mouthparts of the insects		
4	Collect and identify the different types of legs of insects 4.1 Collect insects bearing different types of legs 4.2 Separate legs from insects 4.3 Identify the legs of insects 4.4 Draw and label in practical note book	1	2.5
5	Collect and identify the different types of wings of insects. 5.1 Collect the different types of insects 5.2 Separate wings from insects 5.3 Identify the types of wings 5.4 Draw and label in practical note book	2	2.5
6	Collect, identify and preserve the insects under exopterygota division 6.1 Collect and kill the collected insects 6.2 Identify and separate under different Orders 6.3 Draw and label in practical note book 6.4 Preserve in box	2	2.5
7	Collect, identify and preserve the insects under endopterygota division 7.1 Collect and kill the collected insects 7.2 Identify and separate under different Orders 7.3 Draw and label in practical note book 7.4 Preserve in box	2	2.5
8	Collect and identify insect predators and parasitoids 8.1 Collect the predacious insects and parasitoids 8.2 Identify predators and parasitoids 8.3 Draw and label in practical note book 8.4 Preserve predators and parasitoids	2	2.5
9	Practice surveillance technique of insect population in crop field 9.1 Measure one square meter crop field 9.2 Collect harmful and beneficial insects 9.3 Calculate population density of insect 9.4 Maintain the record of performed task	1	2.5
10	Collect, identify and preserve the different types of spiders and mites 10.1 Collect the different types of spiders and mites. 10.2 Identify the collected specimen 10.3 Draw and label in practical note book 10.4 Preserve in box	1	2.5
	Total	16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

Sl. No.	Item Name	Quantity
01	Hand net, butterfly net, pitfall trap, pheromone trap, light trap, kit box, calculator, alpine box, insect killing jar, vial, insect exhibit case, measuring tape, Petridis, weighing balance, apron, gumboot, hand gloves.	As per requirement

REQUIRED CHEMICALS:

Sl. No.	Item Name	Quantity
01	Formalin, hand sanitizer, silica jell, iso propyl alcohol, resin, toluene, relaxing fluid, preservative card cells, ethyl acetate.	

RECOMMENDED BOOKS:

Sl. No.	Book Name	Writer Name	Publisher Name & Edition
01	Modern Entomology	D. B. Tembhrare	Himalaya Publishing House, Mumbai, India. 2 nd Revised Edition
02	Entomology and Pest Management	L. P. Pedigo, M. E. Rice and R. K. Krell	Waveland Press Inc. 7 th Edition
03	Insect Ecology Behavior, Populations and Communities	P. W. Price, R. F. Denno, M. D. Eubanks, D. L. Finke, I. Kaplan	Cambridge University Press, London

Prepared by

- ❖ Dr. Md. Abdul Latif, Professor, Department of Entomology, Sher-e-Bangla Agricultural University, Dhaka-1207
- ❖ Dr. Anisur Rahman, Chief Instructor, Agriculture Training Institute, Dhaka
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SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
27435	Livestock and Poultry Production	T	P	C
		2	3	3

Rationale	<p>Livestock and Poultry is an integral part of the integrated farming system in Bangladesh as they are major source of animal protein. Human depend on animal for their food, fiber, labor and companionship. Most of the people rear animal in traditional way. If animal and poultry rear according to modern techniques, farmers will be able to produce more meat, milk, egg and others products. So, diploma level student should have conceptual knowledge on basic management techniques of animal. Therefore, this course is designed to introduce animal breeding, housing, feeding and management.</p>
Learning Outcome (Theoretical)	<p>After the completion of the course, student will be able to:</p> <ul style="list-style-type: none"> • Describe the importance of livestock in Bangladesh • Classify the characteristics of different breeds of cattle • Describe the goat rearing method • Summarize the details of cattle rearing • Describe the farm management of domestic animals • State the rearing methods of chicken and duck
Learning Outcome (Practical)	<p>After the completion of the practical course student will be able to</p> <ul style="list-style-type: none"> • Demonstrate the methods of restraining • Identify different breeds of cattle • Identify different breeds of goat • Identify different breeds of poultry • Determine the measures of weights of cattle • Determine the ageing of cattle and goat by dentation • Prepare a ration for cattle, goat and poultry • Demonstrate methods of disbudding and dehorning

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1.	Introduction to Livestock 1.1 Define livestock 1.2 Mention the importance of livestock industry 1.3 State the importance of livestock as food and nutrition 1.4 State the importance of domestic animals in poverty alleviation 1.5 Mention the role of domestic animals in rural employment	3	6
2.	Cattle Breed 2.1 Define breed 2.2 Mention different types of cattle breed 2.3 State the characteristics of indigenous cattle 2.4 Mention the origin and characteristics of Red Sindhi cattle 2.5 Mention the origin and characteristics of Sahiwal cattle 2.6 Mention the origin and characteristics of Holstein Friesian cattle 2.7 State the characteristics of crossbred cattle	4	10
3.	Goat Breed 3.1 Mention different types of goat breed 3.2 State characteristics of Black Bengal goat 3.3 Describe characteristics of Jamunapari goat 3.4 Mention criteria for selecting a breeding goat	4	6
4.	Livestock Rearing 4.1 Describe the housing of cattle and goat 4.2 Mention balanced ration of cattle and goat 4.3 State basic concept of artificial insemination 4.4 Describe hygiene practices in livestock rearing 4.5 Describe the prevention and control of common diseases of livestock	4	6
5.	Livestock Farm Management 5.1 Define livestock farm management 5.2 Mention various aspects of farm management 5.3 Define vaccination and de-worming 5.4 Determine the body weight of the animal 5.5 Describe the method of determining the age by dentation 5.6 Explain castration methods 5.7. Describe the marketing of farm products	4	8
6.	Chicken and Duck Rearing 6.1 Classify the breeds of chicken and duck 6.2 Mention the advantages of rearing poultry and poultry farming 6.3 Describe the factors to be considered in site selection of poultry housing 6.4 Describe types of poultry house 6.5 Explain the lighting schedule of poultry 6.6 Describe different methods of rearing chickens and ducks 6.7 Mention the use of various poultry vaccines 6.8 Explain the causes of vaccine failure 6.9 Describe the biosecurity of a poultry farm	4	8

7.	Litter Management 7.1 Define litter 7.2 Explain the properties of litter 7.3 Mention different types of litter 7.4 Describe the litter management 7.5 State the advantages and disadvantages of litter 7.6 Mention the uses of litter	3	5
8.	Poultry Feeds and Feeding 8.1 Define balanced ration 8.2 Mention the name of essential feed ingredients in poultry 8.3 State the importance of a balanced diet 8.4 Describe the method of preparing a balanced ration 8.5 State water management of poultry	3	6
9	Management of Chicken 9.1 Describe the brooding of chicken 9.2 Differentiate between natural and artificial brooding 9.3 Explain the factors affecting egg production 9.4 Mention the factors affecting meat production 9.5 Describe the methods of egg preservation	3	5
Total		32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Continuous Marks
1.	Identify different breeds of cattle 1.1 Identify the characteristics of indigenous cattle 1.2 Identify the characteristics of exotic breeds of cattle 1.3 Maintain the record of performed task	2	4
2	Identify different breeds of goat 2.1 Identify the external character of Black Bengal goat 2.2 Identify the external character of Jamunapari goat 2.3 Maintain the record of performed tasks	2	3
3	Restrain of cattle and goat 3.1 Demonstrate different restraining techniques of cattle 3.2 Demonstrate different restraining techniques of goat 3.3 Maintain the record of performed tasks	2	3
4	Demonstrate dentation and ageing of cattle and goat 4.1 Demonstrate the dental formula 4.2 Calculate age of various animals by dentation 4.3 Maintain the record of performed tasks	2	3
5	Prepare ration for cattle 5.1 Identify different feed ingredients 5.2 Prepare ration according to standard procedure 5.3 Maintain the record of performed task	2	3
6	Demonstrate disbudding and dehorning 6.1 Demonstrate the method of disbudding in calf 6.2 Demonstrate the method of dehorning 6.3 Maintain the record of performed task	2	3
7	Visit to poultry farm 7.1 Visit to poultry farms	2	3

	7.2 Identify different management techniques used in the farms 7.3 Maintain the record of performed task		
8	Visit to livestock farms 8.1 Visit to livestock farms 8.2 Identify different management techniques used in the farms 8.3 Maintain the record of performed task	2	3
	Total	16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT AND MACHINERY):

SI	Item Name	Quantity
01	Live Black Bengal goat	5
02	Jamunapari goat	5
05	Feed ingredients, pen, paper, calculator, polybag, dish, bucket, balanced	As per required
06	Apron, hand gloves, mask, hand sanitiser, paper, pen and pendrive.	As per required
07	Apron, gumboot, hand gloves, mask, hand sanitiser, soap	As per required

Required Chemicals:

SI	Item Name (Consumables Materials)	Quantity
01	Hand sanitizer	As per required

RECOMMENDED BOOKS:

SI	Book Name	Writer Name	Publisher Name & Edition
01	A Text Book of Animal Husbandry	G. C Banerjee	Oxford & IBH, 8 th Edition
02	Poshupalon O chikitsha	M.A Samad	Lyricpic publication, 2 nd Edition
03	Poshukhamar O Chikitsha	SM Imam Hossain	Tamrolipi, 1 st edition
04	Introduction to Animal Husbandry	Dr. MM Kamal	

WEBSITE REFERENCES:

SI	Web Link	Remarks
01	https://youtu.be/MvPoxPujwxE	
02	http://www.dls.gov.bd/	
03	http://www.blri.gov.bd/	
04	https://www.poultryhub.org/	
05	https://www.youtube.com/channel/UCZ8_slf1r9g3VtsxtsmSM0Q/videos	

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