CURRICULA LAY-OUT FOR B. Sc. Ag. (Hons.) DEGREE

Level	S-I (July-December)		S-2 (January-June)	
	Course (T,P)	**Cr.hrs (T+P)**	**Course (T,P)**	**Cr.hrs (T+P)**
Level-1	Agron 101,102	2+2	Agron 121,122	2+2
	SoilSc 101,102	2+2	Hort 121, 122	2+2
	FMech 101,102	2+2	Biochem 121,122	2+2
	Chem 101,102	3+2	AgStat 121,122	3+2
	AgEcon 101	3+0	RSoc 121	2+0
	Optional (one):		**Elective (any one):**	2+2
	English 101 (2+0)		AHusb 121,122 (2+2)	
	-------- (2+0)		CompSc 121,122 (2+2)	
	Total (Excluding optional)	**12+8**	---------- (2+2)	
			Optional (one):	
			English 101 (2+0)	
			---------- (2+0)	
			Total (Excluding optional)	**13+10**
Level-2	Agron 201, 202	2+2	Entom 221,222	3+2
	SoilSc 201, 202	3+2	PPath 221, 222	3+2
	Hort 201, 202	2+2	GPB 221, 222	2+2
	CBot 201, 202	3+2	AgExt 221, 222	3+2
	Biochem 201, 202	3+2	AgChem 221,222	2+2
	Total	**13+10**	**Total**	**13+10**
LEVEL-3	Hort 301, 302	3+2	Agron 321, 322	3+2
	GPB 301, 302	3+2	SoilSc 321, 322	3+2
	AgExt 301, 302	2+2	Entom 321, 322	3+2
	AgChem 301, 302	3+2	PPath 321, 322	3+2
	AgroF 301, 302	3+2	CBot 321, 322	2+2
	Total	**14+10**	**Total**	**14+10**
Level-4	Entom 401, 402	3+2	Agron 421, 422	3+2
	PPath 401, 402	3+2	SoilSc 421, 422	3+2
	CBot 401, 402	3+2	Hort 421, 422	3+2
	AgExt 401, 402	3+2	GPB 421, 422	3+2
	Elective (any one):	2+2	**Elective (any one):**	2+2
	Biotech 401,402(2+2)		Biotech 401, 402 (2+2)	
	EnvSc 401, 402 (2+2)		EnvSc 401,402 (2+2)	
	---- 401,402/etc(2+2)		------ 401, 402/etc (2+2)	
	Total	**14+10**	**Total**	**14+10**

Agron (12+10) = 22	PPath (9+6) = 15	AgChem (5+4) = 9
SoilSc (11+8) = 19	CBot (8+6) = 14	Biochem (5+4) = 9
Hort (10+8) = 18	GPB (8+6) = 14	AgroF (3+2) = 5
Entom (9+6) = 15	AgExt (8+6) =14	Others (19+12) = 31
Total credit hrs (Theor. +Prac) : 107+78 = 185		
Total no. of courses (Theor.+Prac) : 41+39 = 80		

* Modified from the originally submitted one, and approved in the 141st Academic Council meeting held on 17th and 24th January, 2002 and approved by the syndicate in its 252nd meeting held on 23.3.2002.

Summary information on types of courses and credit requirement for B.Sc.Ag. (Hons) degree in the semester (cf. course lay-out)

Types of courses		Credits	Levels & semesters the credits to be earned from
(I)	Compulsory	173	All 4 levels (S-1, S-2)
(II)	Elective	12	Level – 1 (S-2) & Level – 4 (S-1, S-2)
(III)	Optional	4	Level – 1 (S-1, S-2)
Total earned credit requirement (Excluding optional) = 185			

Types of courses–compulsory/elective/optional to be offered by different departments at different levels (year) and semesters for B.Sc.Ag. (Hons) degree in the semester system from July 2002

Sl.	Course No. and Title	Credit	Contact hrs/wk	Available at	
				Level	Semester
1.	Department of Agronomy				
	Compulsory:				
	Agron 101: Fundamentals of Agronomy-Theory	2 cr	2hrs	L-1	S-1
	Agron 102: Introductory Agronomic Practices	2 cr	3 hrs	"	"
	Agron 121: Seed Science and Technology-Theory	2 cr	2 hrs	L-1	S-2
	Agron 122: Seed Science & Technology-Practical	2 cr	3 hrs	"	"
	Agron 201: Weed Science-Theory	2 cr	2 hrs	L-2	S-1
	Agron 202: Practical Weed Science-Practical	2 cr	3 hrs	"	"
	Agron 321 : Crop Husbandry-Theory	3 cr	3 hrs	L-3	S-2
	Agron 322 : Crop Husbandry-Practical	2 cr	3 hrs	"	"
	Agron 421 : Crop Production & Farm Management-Theory	3 cr	3 hrs	L-4	S-2
	Agron 422 : Crop Production & Farm Management-Practical	2 cr	3 hrs	"	"
	Elective:				
	Agron 401: Introductory Cropping System	2 cr	2hrs	L-4	S-1
	Agron 402: Practical Introductory Cropping System	2 cr	3 hrs	"	"
	Agron 423: Forage Crops and Pasture Management	2 cr	2 hrs	L-4	S-2
	Agron 424: Practical Forage and Pasture Crops	2 cr	3 hrs	"	"
2.	**Department of Soil Science**				
	Compulsory:				
	Soil Sc 101: Introductory Soil Science-Theory	2 cr	2 hrs	L-1	S-1
	Soil Sc 102: Soil Science-Practical – 1	2 cr	3 hrs	"	"
	Soil Sc 201: Soil Survey, Classification & Conservation- Theory	3 cr	3 hrs	L-2	S-1
	Soil Sc 202: Soil Science-Practical – 2	2 cr	3 hrs	"	"
	Soil Sc 321 : Soil Physics & Soil Chemistry- Theory	3 cr	3 hrs	L-3	S-2
	Soil Sc 322: Soil Science- Practical – 3	2 cr	3 hrs	"	"
	Soil Sc 421: Soil Microbiology & Soil Fertility-Theory	3 cr	3 hrs	L-4	S-2
	Soil Sc 422: Soil Science-Practical – 4	2 cr	3 hrs	"	"
	Elective:	-	-	-	-
	Soil Sc 401: Soil Biology-Theory	2 cr	2 hrs	L-4	S-1
	Soil Sc 402: Soil Pollution-Theory	2 cr	2 hrs	L-4	S-1
3.	**Department of Entomology**				
	Compulsory:				
	Entom 221: Fundamentals of Entomology-Theory	3 cr	3 hrs	L-2	S-2
	Entom 222: Fundamentals of Entomology-Practical	2 cr	3 hrs	"	"
	Entom 321: Insect Ecology & Pest Management-Theory	3 cr	3 hrs	L-3	S-2
	Entom 322: Insect Ecology & Pest Management-Practical	2 cr	3 hrs	"	"
	Entom 401: Economic Entomology-Theory	3 cr	3 hrs	L-4	S-1
	Entom 402: Economic Entomology-Practical	2 cr	3 hrs	"	"
	Elective: Not available				
4.	***Department of Horticulture***				
	Compulsory:				
	Hort 121: Fundamental of Horticulture-Theory	2 cr	2 hrs	L-1	S-2
	Hort 122: Fundamental of Horticulture-Practical	2 cr	3 hrs	"	"
	Hort 201: Ornamental Horticulture & Plantation Crops-Theory	2 cr	2 hrs	L-2	S-1
	Hort 202: Ornamental Horticulture & Plantation Crops-Practical	2 cr	3 hrs	"	"
	Hort 301: Vegetables & Spice Crops-Theory	3 cr	3 hrs	L-3	S-1
	Hort 302: Vegetables & Spice Crops-Practical	2 cr	3 hrs	"	"
	Hort 421: Pomology-Theory	3 cr	3 hrs	L-4	S-2
	Hort 422: Pomology-Practical	2 cr	3 hrs	"	"
	Elective:				
	Hort. 401: Post harvest management of Hort Crops-Theory	2 cr	2 hrs	L-4	S-1
	Hort. 402: Postharvest Management of Horticulture Crops-Practical	2 cr	3 hrs	"	"
	Hort. 403: Commercial Horticulture-Theory	2 cr	2 hrs	L-4	S-2
	Hort. 404: Commercial Horticulture-Practical	2 cr	3 hrs	"	"
5.	**Department of Plant Pathology**				

Sl.	Course No. and Title	Credit	Contact hrs/wk	Available at	
				Level	Semester
	Compulsory:				
	PPath 221: Fundamentals of Plant Pathology-Theory	3 cr	3 hrs	L-2	S-2
	PPath 222:Plant Pathology-Practical 1	2 cr	3 hrs	”	
	PPath 321: Principles of Plant Pathology & Diseases of Field Crops-Theory	3 cr	3 hrs	L-3	S-2
	PPath 322: Plant Pathology-Practical 2	2 cr	3 hrs	”	“
	PPath 401 : Diseases of fruits, Vegetables, Cash Crops, Agro-forest trees and Seed Pathology-Theory	3 cr	3 hrs	L-4	S-1
	PPath 402: Plant Pathology-Practical 3	2 cr	3 hrs	”	“
	Elective:				
	PPath 404: Plant Disease Management-Practical	2 cr	3 hrs	L-4	S-1
	PPath 422: Plant Disease Clinic-Practical	2 cr	3 hrs	L-4	S-2
6.	***Department of Crop Botany***				
	Compulsory:				
	CBot 201: Plant Morphology, Embriology and Taxonomy & Embryology-Theory	3 cr	3 hrs	L-2	S-1
	CBot 202: Plant Morphology, Embriology and Taxonomy & Embryology–Practical	2 cr	3 hrs	„	“
	CBot 321: Plant Physiology & Ecology (I)-Theory	2 cr	2 hrs	L-3	S-2
	CBot 322 Plant Physiology & Ecology (I)- Practical	2 cr	3 hrs	”	“
	CBot 401: Plant Physiology and Ecology (II)-Theory	3 cr	3 hrs	L-4	S-1
	CBot 402: Plant Physiology and Ecology (II)- Practical	2 cr	3 hrs	”	“
	Elective:				
	CBot 421: Crop Physiology-Theory	2 cr	2 hrs	L-4	S-2
	CBot 422: Crop Physiology-Practical	2 cr	3 hrs	”	“
	CBot 423: Plant Biodiversity & Conservation-Theory	2 cr	2 hrs	L-4	S-2
	CBot 424 : Plant Biodiversity & Conservation-Practical	2 cr	3 hrs	”	“
7.	**Department of Genetics & Plant Breeding**				
	Compulsory:				
	GPB 221: Cytology-Theory	2 cr	2 hrs	L-2	S-2
	GPB 222: Cytology-Practical	2 cr	3 hrs	”	“
	GPB 301: Genetics and Cytogenetics-Theory	3 cr	3 hrs	L-3	S-1
	GPB 302: Genetics-Practical	2 cr	3 hrs	”	“
	GPB 421: Plant Breeding-Theory	3 cr	3 hrs	L-4	S-2
	GPB 422: Plant Breeding-Practical	2 cr	3 hrs	”	“
	Elective:				
	GPB 401: Biotechnology and Genetic Engineering-Theory	2 cr	2 hrs	L-4	S-1
	GPB 402: Biotechnology and Genetic Engineering-Practical	2 cr	3 hrs	”	“
	GPB 423: Special Plant Breeding – Theory	2 cr	2 hrs	L-4	S-2
	GPB 424: Special Plant Breeding – Practical	2 cr	3 hrs	”	“
8.	**Department of Agricultural Extension Education**				
	Compulsory:				
	AgExt 221: Fundamentals of Extension, Leadership and Motivatio Theory	3 cr	3 hrs	L-2	S-2
	AgExt 222: Extension Teaching Methods and Aids-Practical	2 cr	3 hrs	”	“
	AgExt 301: Extension Communication and Group Approaches-Theory	2 cr	2 hrs	L-3	S-1
	AgExt 302: Data Collection, Processing and Report Writing-Practical	2 cr	3 hrs	”	“
	AgExt 401: Extension Organization Management-Theory	3 cr	3 hrs	L-4	S-1
	AgExt 402: Extension Programme Planning and Outreach Programme-Practical	2 cr	3 hrs	„	“
	Elective:				
	AgExt 403: Extension for Sustainable Agricultural Development–Theory	2 cr	2 hrs	L-4	S-1
	AgExt 404: Extension for Sustainable Agricultural Development–Practical	2 cr	3 hrs	„	„
	AgExt 421: Community Participation-Theory	2 cr	2 hrs	L-4	S-2
	AgExt 422: Community Participation – Practical	2 cr	3 hrs	”	”

Sl.	Course No. and Title	Credit	Contact hrs/wk	Available at	
				Level	Semester
9.	**Department of Agricultural Chemistry**				
	Compulsory:				
	AgChem 221: Nuclear and Agro-industrial Chemistry – Theory	2 cr	2 hrs	L-2	S-2
	AgChem 222: Nuclear and Agro-industrial Chemistry-Practical	2 cr	3 hrs	”	”
	AgChem 301: Plant Nutrition, Pesticide and Environmental Chemistry –Theory	3 cr	3 hrs	L-3	S-1
	AgChem 302: Plant Nutrition, Pesticide and Environmental Chemistry – Practical	2 cr	3 hrs	”	”
	Elective:				
	AgChem 401: Bioenergy – Principles & Practices – Theory	2 cr	2 hrs	L-4	S-1
	AgChem 402: Bioenergy – Principles and Practices – Practical	2 cr	3 hrs	”	”
	AgChem 421: Micro nutrients in agriculture –Theory	2 cr	2 hrs	L-4	S-2
	AgChem 422: Micro nutrients in Agriculture- Practical	2 cr	3 hrs	”	”
10.	**Department of Biochemistry**				
	Compulsory:				
	Biochem 121: Chemistry of Biomolecules-Theory	2 cr	2 hrs	L-1	S-2
	Biochem 122: Chemistry of Biomolecules-Practical	2 cr	3 hrs	”	“
	Biochem 201: Metabolism and Human Nutrition-Theory	3 cr	3 hrs	L-2	S-1
	Biochem 202: Metabolism and Human Nutrition-Practical	2 cr	3 hrs	”	“
	Elective:				
	Biochem 401: Fundamentals of Molecular Biochemistry & Biotechnology-Theory	2 cr	2 hrs	L-4	S-1
	Biochem 402: Fundamentals of Plant Biochemistry-Practical	2 cr	3 hrs	”	”
11.	**Department of Chemistry**				
	Compulsory:				
	Chem 101: Chemistry – Theory	3 cr	3 hrs	L-1	S-1
	Chem 102: Chemistry – Practical	2 cr	3 hrs	”	”
12.	**Department of Agroforestry**				
	Compulsory:				
	AgroF 301: Principles of Agroforestry – Theory	3 cr	3 hrs	L-3	S-1
	AgroF 302: Principles of Agroforestry – Practical	2 cr	3 hrs	”	“
	Elective: Not available	-	-	-	-
13.	**Department of Language**				
	Optional:				
	Lang 101: English Language	2 cr	2 hrs	L-1	S-1,2
14.	**Department of Agricultural Economics**				
	Compulsory:				
	AgEcon 101: Agricultural Economics	3 cr	3 hrs	L-1	S-1
15.	**Department of Rural Sociology**				
	Compulsory:				
	RSoc 121: Rural Sociology	2 cr	2 hrs	L-1	S-2
16.	**Department Agricultural Statistics**				
	Compulsory:				
	AgStat 121: Agricultural Statistics- Theory	3 cr	3 hrs	L-1	S-2
	AgStat 122: Agricultural Statistics – Practical	2 cr	3 hrs	”	“
17.	**Department of Farm Power & Machinery**				
	Compulsory:				
	FMech 101: Farm Mechanics – Theory	2 cr	2 hrs	L-1	S-1
	FMech 102: Farm Mechanics – Practical	2 cr	3 hrs	”	“
18.	**Department of Animal Science**				
	Elective:				
	AS 121: Animal Science – Theory	2 cr	2 hrs	L-1	S-2
	AS 122: Animal Science – Practical	2 cr	3 hrs	”	“
19.	**Department of Biotechnology**				
	Elective:				
	Biotech 401: Theory (cf. GPB: 401)	2 cr	2 hrs	L-4	S-1,2
	Biotech 402: Practical (cf. GPB: 402)	2 cr	3 hrs	“	“

Sl.	Course No. and Title	Credit	Contact hrs/wk	Available at	
				Level	Semester
20.	**Department of Environmental Science**				
	Elective:				
	EnvSc 401: Theory (Not available)	2 cr	2 hrs	L-4	S-1, 2
	EnvSc 402 : Practical (Not available)	2 cr	3 hrs	”	“
21.	**Department of Computer Science & Mathematics**				
	Elective:				
	CompSc 121: Theory (Not available)	2 cr	2 hrs	L-1	S-2
	CompSc 122: Practical (Not available)	2 cr	3 hrs	”	”

SYLLABUS FOR B.SC. AG. (Hons.) DEGREE

DEPARTMENT OF AGRONOMY

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Title	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
AGRON 111: Fundamentals of Agronomy-Theory	2 cr	2hrs	L-1	S-1
AGRON 112: Introductory Agronomic Practices-P	2 cr	3 hrs	”	”
AGRON 121: Seed Science and Technology-Theory	2 cr	2 hrs	L-1	S-2
AGRON 122: Seed Science & Technology-Practical	2 cr	3 hrs	”	”
AGRON 211: Weed Science-Theory	2 cr	2 hrs	L-2	S-1
AGRON 212: Weed Science-Practical	2 cr	3 hrs	”	”
AGRON 321 : Crop Husbandry-Theory	3 cr	3 hrs	L-3	S-2
AGRON 322 : Crop Husbandry-Practical	2 cr	3 hrs	”	”
AGRON 421 : Crop Production & Farm Management-T	3 cr	3 hrs	L-4	S-2
AGRON 422 : Crop Production & Farm Management-Practical	2 cr	3 hrs	”	”
Elective:				
AGRON 411: Introductory Cropping Systems—Theory	2 cr	2hrs	L-4	S-1
AGRON 412: Introductory Cropping Systems-Practical	2 cr	3 hrs	”	”
AGRON 423: Forage Crops and Pasture Management-T	2 cr	2 hrs	L-4	S-2
AGRON 424: Forage Crops and Pasture Crops- Practical	2 cr	3 hrs	”	”

Level-2, Semester-1

AGRON 211: Weed Science- Theory, 2 Credits, 2 hrs/hr

Introduction to Weed: Definition, characteristics and classification. Agricultural and non -agricultural losses caused by weeds. Positive value of weed, brief account of the common weeds of Bangladesh with emphasis on the biology of major weeds.
Survival Mechanism of Weed: Propagation, dispersal and persistence.
Distribution of Weeds: Weed distribution in relation to soil, season, land topography, crop and crop production practices.
Crop-Weed Competition: Concept, critical period of weed competition and factors affecting crop-weed completion, competitive ability of weeds and the factors affecting it. Allelopathic effects of weeds on crops and vice-versa.
Weed Management: Concept and principle of integrated weed management. Weed eradication. Cultural, biological and herbicidal methods of weed control- their advantages and disadvantages. Classification, formulation and mode of action of herbicides. Methods of herbicides application. Factors affecting the foliage and soil applied herbicides. Herbicide selectivity and factors affecting it. Herbicidal weed control in major crops, viz. rice, jute, wheat, cotton and sugarcane. Toxic symptoms of herbicides in weeds and crops. Effects of herbicide on environment.

AGRON 212: Weed Science-Practical, 2 Credits, 3 hrs/wk

1. Identification of weeds and weed seeds/propagules.
2. Preparation of weed herbarium.
3. Study of life cycle and morphology of major weeds- (a) grass, (b) sedge and (c) broadleaf weeds.
4. Study on identification of herbicides and study of their physical characteristics.

5. Calibration of a sprayer
6. Herbicide calculation.
7. Spraying of non-selective, pre-emergence and post-emergence herbicides in crop field to study their effect on crop and weed
8. Weed survey in major crops of BAU farm and determination of importance value of weeds.

Text and Reference Books

Aldrish, R.J. 1984. Weed-crop ecology- Principles in Weed Management. Breton Publishers, Massachusetts, U.S.A.

Alteri, M.A. and Liebman, M. 1988. Weed Management in Agroecosystem : Ecological Approaches, CRC Press, Inc. Boca Raton Florida, U.S.A.

Auld, B.A. and K.U. Kim. 1996. Weed Management in Rice. Published by FAO, Rome, Italy.

Grafts, A.S. and Robbins, W.W. 1973. Weed Control. Tata-McGraw-Hill Publishing Co. Ltd., New Delhi, 669p.

Griffiths, W. 1990. Weed Guide. Published by Schering Agriculture, Nottingham Road, Stapleford, Nottingham NG98AG, U.K.

Gupta, O.P. and Lamba, P.S. 1978. Modern Weed Science. Today and Tomorrow's Printers and Publishers, Desh Bandhu Gupta Road, New Delhi.

Hance, R.J. and Holy, K. 1990. Weed Control Hand Book: Principles (8th Edition). Blackwell Scientific Publication, Oxford.

Holm, L.G.; Doll, J., Holm, E., Pancho, J. and Herberger, J.P 1977. The Worlds Weeds: Distribution and Biology. University Press of Hawaii, Honolulu.

Hill, T.A. 1977. The biology of weeds. Studies in Biology. No. 79, Edward Arnold, London.

Herberger, J.P.1997. World weeds: Natural histories and distributions. Wiley, New York, U.S.A.

Labrada, R.; Caseley, J.C. and Parker, C. 1994. Weed Management for developing countries. Published by FAO, Rome, Italy.

Morita, H. 1997. Handbook of Arable weeds in Japan- For correct identification. Published by Kumiai Chemical Industry Coo. Ltd., Taitoh-ku, Tokyo 110, Japan.

Zimdahl,, R.L. 1980. Weed-crop competition- a review. International Plant Protection Centre, Oregon State University, Cornallis,Oregon,U.S.A

DEPARTMENT OF SOIL SCIENCE

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Titles	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
SS 111: Introductory Soil Science-Theory	2 cr	2 hrs	L-1	S-1
SS 112: Introductory Soil Science-Practical	2 cr	3 hrs	"	"
SS 211: Soil Survey, Classification & Conservation-Theory	3 cr	3 hrs	L-2	S-1
SS 212: Soil Survey, Classification & Conservation- Practical	2 cr	3 hrs	"	"
SS 321 : Soil Physics & Soil Chemistry- Theory	3 cr	3 hrs	L-3	S-2
SS 322: Soil Physics & Soil Chemistry – Practical	2 cr	3 hrs	"	"
SS 421: Soil Microbiology & Soil Fertility-Theory	3 cr	3 hrs	L-4	S-2
SS 422: Soil Microbiology & Soil Fertility - Practical-4	2 cr	3 hrs	"	"
Elective:	-	-	-	-
SS 411: Soil Biology-Theory	2 cr	2 hrs	L-4	S-1
SS 412: Soil Biology –Practical	2 cr	2 hrs	"	"
SS 423: Soil Pollution –Theory	2 cr	2 hrs	L-4	S-2
SS 424: Soil Pollution-Practical	2 cr	2 hrs	"	"

Level-2, Semester-1

SS 211: Soil Survey, Classification and Conservation- Theory, 3 Credits, 3 hrs/wk

Soil survey

Purpose, kinds and methods of soil survey, mapping and report preparation

SOIL CLASSIFICATION

Systems of soil classification - Soil Taxonomy and FAO system

Characteristics of different orders of Soil Taxonomy and their equivalent General Soil Types of Bangladesh**Soils of Bangladesh**

Geomorphology – hills, terraces and floodplains

General Soil Types - characteristics

Agroecological Zones (AEZ) – principles of AEZ, description of different AEZs

Problem soils - Saline soils, acid sulphate soils, peat soils and degraded rice soils

Land classification

Criteria for land evaluation

Land capability classification of Bangladesh

Soil organic matter

Sources and composition of soil organic matter

Effects of organic matter on soil properties

Humus formation, C/N ratio

Soil erosion and conservation

Soil erosion – types and factors of soil erosion, soil loss equations

Soil conservation – purpose and techniques of soil conservation

Soil pollution

Causes of soil pollution

Remedial measures of soil pollution

SS 212: Soil Survey, Classification and Conservation - Practical-2, 2 Credits, 3 hrs/wk

1. Identification of different textural types of soil by finger feel method
2. Determination of soil colour by Munsell's colour chart
3. Determination of pH by BAU Soil Testing Kit
4. Determination of soil organic carbon by wet oxidation method
5. Determination of carbonate and bicarbonate of soil by differential titration method
6. Determination of electrical conductivity of soil by conductivity meter
7. Study of soil profile
8. Preparation of soil survey report

Text and Reference Books

Brammer, H. 1996. The Geography of the Soils of Bangladesh. University Press Ltd., Dhaka, Bangladesh.

Dent, D. and Yong, A. 1981. Soil Survey and Land Evaluation. George Allen and Unwin Pub. Ltd., London.

FAO report. 1988. Land Resources Appraisal of Bangladesh for Agricultural Development, Agroecological Regions of Bangladesh. Report-2.

Greenland, D.J. and Lal, R. 1977. Soil Conservation and Management in the Humid Tropics. John Wiley & Sons Inc., New York.

Hussain, M.S. 1992. Soil Classification with Special Reference to the Soils of Bangladesh. Univ. Dhaka.

Kononova, M.M. 1966. Soil Organic Matter. 2nd Edn., Pergamon Press, Oxford, London.

Lal, R. 1988. Soil Erosion Research Methods. ISSS, Wageningen, The Netherlands.

Mishra, P.C. 1989. Soil Pollution. Asia Pub. House, India.

Tamhane, R.U., Motiramani, D.P., Bali, Y.P. and Donahue, R.L. 1970. Soils-Their Chemistry and Fertility in Tropical Asia. Prentice Hall of India Pvt. Ltd., New Delhi.

USDA, 1978. Soil Taxonomy-A Basic System of Soil Classification for making and interpreting Soil Surveys. National Bureau of Soil Survey and Land Use Planning (ICAR), New Delhi.

DEPARTMENT OF ENTOMOLOGY

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Title	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
ENTOM 221: Fundamentals of Entomology (Theory)	3 cr	3 hrs	L-2	S-2
ENTOM 222: Fundamentals of Entomology (Practical)	2 cr	3 hrs	"	"
ENTOM 321: Insect Ecology & Pest Management (Theory)	3 cr	3 hrs	L-3	S-2
ENTOM 322: Insect Ecology & Pest Management(Practical)	2 cr	3 hrs	"	"
ENTOM 411: Economic Entomology (Theory)	3 cr	3 hrs	L-4	S-1
ENTOM 412: Economic Entomology (Practical)	2 cr	3 hrs	"	"
Elective: (Not available)	-	-	-	-

Level-2, Semester-2

ENTOM 221: Fundamentals of Entomology-Theory, 3 credits, 3 hrs/wk

Insecta and Arachnida: General characters and classifications.

Insect morphology: External anatomy of insect. Antennae, legs, mouthparts, wings, stridulatory organs and integument in insects.
Insect taxonomy: Diagnostic characters and economic importance of orders and families of insects, mites and spiders of agricultural importance.
Insect physiology: Insect nutrition. Endocrine glands- neurosecretory cells, corpora cardiaca, corpora allata and thoracic glands. Insect hormones- types of hormones and their functions. Moulting- Process of moulting. Metamorphosis- types of metamorphosis, hormonal control of metamorphosis.
Insect neurobiology: Neuron- Sensory neuron, motor neuron and associated neuron, reflex arc. Sense organs- mechanoreceptor, chemoreceptor, photoreceptor, auditory receptor, temperature and humidity receptor. Nervous system- central, peripheral and sympathetic nervous system.
Insect reproduction: Reproductive system and types of reproduction.

ENTOM 222: Fundamentals of Entomology- Practical, 2 credits, 3 hrs/wk
1. External anatomy of insect.
2. Study of various types of antennae, legs, mouthparts and wings of insects.
3. Techniques of preparation of temporary and permanent slides of insect appendages.
4. Internal anatomy of grasshopper, cotton bug and a lepidopteran insect.
5. Methods of collecting, killing, preparing and preserving of insects.
6. Identification up to family of insects, mites and spiders of economic importance in Bangladesh.

Text and Reference Books

Borror, D.J., Delong, D.M. and Triplehorn, C.A. 1976. An introduction to the study of insects. Holt Rinchart and Winston, New York.
Gillot, C. 1995. Entomology. Plenum Publ. Corp., New York.
Richards, O.W. and Davis, R.G. 1977. Imm's general textbook of Entomology. Vols. I & II., Chapman and Hall, London.
Ross, H. H. 1965. A text book of Entomology. John Wiley, New York.
Blum, M.S. 1985. Fundamentals of insect physiology. John Wiley & Sons, New York.
Fiennes, R. N. 1972. Biology of nutrition. Pregamon Press, Oxford and New York.
Frederik, H. and Jhout, N.I. 1994. Insect hormones. Intercept Ltd., London.
Hossain, M. and Rahman, R. 1984. Uchchatar Kittatta (in Bengali), Bangla Academy, Dhaka.
Hossain, M. and Rahman, R. 1985. Opakhkhal O Bahipakhkhal Kitpatanga Parichiti (in Bengali), Bangla Academy, Dhaka.
Mani, M.S. 1990. General Entomology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
Nayar, K. K., Ananthakrishnan, T. N. and David, B. V. 1985. General and applied Entomology. Tata McGraw- Hill Publ. Co. Ltd., India.
Pathak, S.C. and Sahai . Y.N. 1986. Recent advances in insect physiology, morphology and ecology. Todays and Tomorrow's Printers & Publishers, New Delhi.
Rahman, R.and Hossain, M. 1985. Ontapakhkhal Kitpatanga Parichiti (in Bangali), Bangla Academy, Dhaka.
Romoser, W.S. 1973. The science of Entomology. MacMillan Publ. Co., New York.
Saxena, A. B. 1996. Hormones of insects. Anmol Publ, India.
Snodgrass, R. E. 1994. Principles of insect morphology. CBS Publ. & Dist. India.
Wigglesworth, V. B. 1967. The principles of insect physiology. Mathuen & Co., London

DEPARTMENT OF HORTICULTURE

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Title	*Credit*	Contact hrs/wk	Available at	
			Level	Semester

Compulsory:				
HORT 121: Fundamentals of Horticulture-Theory	2 cr	2 hrs	L-1	S-2
HORT 122: Fundamentals of Horticulture- Practical	2 cr	3 hrs	”	”
HORT 211: Ornamental Horticulture & Plantation Crops-Theory	2 cr	2 hrs	L-2	S-1
HORT 212: Ornamental Horticulture & Plantation Crops- Practical	2 cr	3 hrs	”	”
HORT 311: Vegetables & Spice Crops- Theory	3 cr	3 hrs	L-3	S-1
HORT 312: Vegetables & Spice Crops- Practical	2 cr	3 hrs	”	”
HORT 421: Pomology- Theory	3 cr	3 hrs	L-4	S-2
HORT 422: Pomology- Practical	2 cr	3 hrs	”	”
Elective:				
HORT 411: Postharvest management of Horticultural Crops-Theory	2 cr	2 hrs	L-4	S-1
HORT 412: Postharvest Management of Horticultural Crops-Practical	2 cr	3 hrs	”	”
HORT 423: Commercial Horticulture- Theory	2 cr	2 hrs	L-4	S-2
HORT 424: Commercial Horticulture- Practical	2 cr	3 hrs	”	”

Level- 2, Semester-1

HORT 211: Ornamental Horticulture and Plantation Crops – Theory, 2 Crdits, 2 hrs/wk

1. **Importance and classification:** Scope, importance and classification of ornamental plants and plantation crops.
2. **Production and management of ornamental plants**

    a) Bedding flowers: Zinnia, cosmos, calendula, globe amaranth, phlox, antirrhinum, dianthus, balsam, corn-flower and lupin.
    b) Commercial flowers: Rose, dahlia, chrysanthemum, carnation, tuberose, gladiolus, marigold, aster, jasmine and lilies.
    c) Ornamental shrubs, trees, palms, orchids, ferns and cacti.

3. **Landscape horticulture:** Landscape horticulture and its classification, theory and principles of landscape gardening, development and maintenance of lawn, turf and hedge.
4. **Garden architecture and decoration:** Formal and informal garden; principles and geometry; establishment and maintenance of home and institutional gardens, water garden, rock-garden, park, bonsai, topiary, pergola and arches.
5. **Commercial floriculture:** Management of cut and dry flowers, production of perfumes and aromatics, business development.
6. **Production and management of plantation crops:** Production, management and processing of plantation crops: Rubber, oil palm, cocoa, betel leaf, betel nut and bamboo.

HORT 212:Ornamental Horticulture and Plantation Crops- Practical, 2 Credits, 3 hrs/wk

1. Identification of different flowers, ornamental plants, cacti, fern, orchid and plantation crops and their propagating materials.
2. Preparation of seed album for ornamental plants.
3. Preparation of herbarium.
4. Preparation and packaging of cut flowers for marketing.
5. Preparation of bouquet and flower arrangements for different purpose.
6. Making bonsai and topiary.
7. Techniques of growing orchids and cacti.
8. Graphic design of different types of ornamental gardens and their components.
9. Graphic design of park.
10. Cost of production of rose and tuberose.
11. Raising of saplings of plantation crops.

Text and Reference Books

Bose T.K. and B. Choudhury. 1991. Tropical Garden Plants in Colour. Horticulture and Allied Publishers. Calcutta.

Bose, T.K. and L.P. Yaday. 1989. Commercial Flowers. Naya Prakash, Calcutta.

Bose, T.K., R.S. Maiti, R.S. Dhua and P. Das. 1999. Floriculture and Landscaping. Naya Prokash Calcutta.

Chadha, K.L. 2001. Hand Book of Horticulture. ICAR, New Delhi.

Kumar, N; J.B.M.M.A. Khader, P. Rangaswami and I. Irulappan.2000. Introduction to Spices, Plantation Crops, Medicinal and Aromatic Plants. Oxford & IBH Pub. Co. Pvt. Ltd., New Delhi.
McMillan, H.E. 1962. Tropical Planting and Gardening. MacMillan, London.
Pal B.P. 1991. The Rose in India. ICAR, New Delhi.
Randhawa, G.S. and A. Mukhupadhyay. 1994. Floriculture in India. Allied Pub. Ltd., New Delhi.
Rashid, M.M. 1990. Phuler Chas. Bangla Academy, Dhaka.
Srivastava H.C., B. Vatsu and K.K.G. Menon. 1986. Plantation Crops: Opportunities and Constraints. Oxford & IBH Pub., New Delhi, India.
Swarup, V. 1979. Garden Flowers. National Book Trust, New Delhi.

DEPARTMENT OF PLANT PATHOLOGY

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Title	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
PPATH 221: Fundamentals of Plant Pathology- Theory	3 cr	3 hrs	L-2	S-2
PPATH 222: Fundamentals of Plant Pathology- Practical	2 cr	3 hrs	”	”
PPATH 321: Principles of Plant Pathology & Diseases of Field Crops-Theory	3 cr	3 hrs	L-3	S-2
PPATH 322: Principles of Plant Pathology & Diseases of Field Crops –Practical	2 cr	3 hrs	”	“
PPATH 411: Diseases of fruits, Vegetables, Cash Crops, Agro-forest Trees and Seed Pathology-Theory	3 cr	3 hrs	L-4	S-1
PPATH 412: Diseases of fruits, Vegetables, Cash Crops, Agro-forest Trees and Seed Pathology- Practical	2 cr	3 hrs	”	“
Elective:				
PPATH 421: Plant Disease Management- Theory	2 cr	3 hrs	L-4	S-2
PPATH 422: Plant Disease Clinic- Practical	2 cr	3 hrs	“	“

Level-2, Semester-2

PPATH 221: Fundamentals of Plant Pathology-Theory, 3 Credits, 3 hrs/wk

Introduction of Plant Pathology and its history.
Concept, Causes and Significance of Plant diseases with special reference to Bangladesh.
Introduction to fungi :

(a) General characteristics of fungi including morphology, reproduction and nutrition, nomenclature and classification of fungi. Study of the following genera including their families and orders: *Synchytrium, Pythium, Phytophthora, Peronospora, Albugo, Rhizopus, Saccharomyces, Penicillium, Aspergillus, Erysiphe, Claviceps, Puccinia*, *Ustilago* and *Agaricus.*

(b) Detailed study of the orders, families, genera of deuteromycotina.

Introduction to Bacteria. General morphology, reproduction and nutrition infection process, classification of plant pathogenic bacteria, symptoms of bacterial diseases with examples.

Introduction to Plant Viruses and Mycoplasmas: Nature of viruses, physical and chemical structures, infection process and replication, transmission, identification and classification of viruses; viroids and mycoplasmas. Introduction to Plant Parasitic Nematodes: Morphology, anatomy, physiology with special emphasis to feeding and reproduction;classification of plant parasitic nematodes, symptoms of nemic diseases with examples.

Plant diseases caused by parasitic phanerogams.

PPATH 222: Fundamentals of Plant Pathology - Practical, 2 Credits, 3 hrs/wk

Calibration of microscope and measurements of plant pathogens.
Techniques involved in preparation of slides for microscopic study
Perparation of culture media.
Sterilization: Methods and techniques.
Isolation and detection of fungi, bacteria and nematodes from diseased plant materials and soil.
Isolation and detection of viruses from diseased plant materials
Study of the following genera of fungi :
Synchytrium, Pythium, Mucor, Rhizopus, Aspergillus, Penicillium, Agaricus, Alternaria,, Curvularia, Pyricularia, Fusarium, Rhizoctonia *and* Sclerotium,
Demonstration of different types of symptoms of plant diseases.

Text and Reference Books

Alexopoulos, C.J. 1962. Introductory Mycology. John Wiley & Sons. Inc. N.Y.
Webster,J.1990. Introduction to Fungi. Third Edition. Cambridge University Press, Cambridge.
Mathews, R.E.F. 1991. Plant Virology. Third Edition. Academic Press, INC.1250 Sixth Avenue, San Diego, California,USA.
Bawden, F.C. 1964. Plant Viruses and Virus diseases. The Ronald Press.
Goto, M. 1996. Fundamental of Bacterial Plant Pathology. Academic Press Inc. Tokyo.
Jenkins, W. R. and D. P. Taylor, 1967. Plant Nematology. Reinhold Pub. Corp. N.Y. Amsterdam and London.
Christensen, Cm. 1961. The Molds and Man: An Introduction to Fungi. University of Mennesota Press.
Christie, J. R. 1959. Plant Nematodes: Their Dynamics and Control. Florida Agricultural Experimental Station, USA.
Emerson, F. 1946. Microbes Militant: A challenge to Man: The Ronald Press Company.
Mundkur, B. B. 1964. Fungi and Plant diseases: MacMillan & Company, London.
Pelezar, M. J. J. Jr. and R. D. Reid. 1950. Microbiology. McGraw-Hill Book Company, New York.
Stavenson, G. 1967. The Biology of Fungi, Bacteria and Viruses.
Thimann, K. V. 1966. The life of Bacteria. The MacMillan Co.
Weidel, W. 1959. Virus. The University of Michigan Press.
Corbett, J. K. and H. D. Sister (Ed) 1964. Plant Virology. University of Florida Press. Gainsville.
Mehrotra, Brahm Swarlep. 1967. The Fungi. 2nd ed. Oxford & IBH Publishing Co., New Delhi.
Rangaswami, G., 1972. Diseases of crop Plants in India. Prentice Hall of India Private Ltd.
Singh, R. S. 1973. Plant Diseases. 3rd ed. Oxford & IBH.
Stakman, E. C. and J. C. Harrar, 1957. Principles of Plant Pathology. The Ronald Press Company, New York.
Thorne, G. 1961. Principles of Nematology. MacGraw-Hill Book Co., N. Y.

DEPARTMENT OF CROP BOTANY

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Titles	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
CBOT 211: Plant Morphology, Embryology and Taxonomy-Theory	3 cr	3 hrs	L-2	S-1
CBOT 212: Plant Morphology, Embryology and Taxonomy-Practical	2 cr	3 hrs	”	”
CBOT 321: Plant Physiology & Ecology(I)-Theory	2 cr	2 hrs	L-3	S-2
CBOT 322: Plant Physiology & Ecology(I)-Practical	2 cr	3 hrs	”	”
CBOT 411: Plant Physiology and Ecology(II)-Theory	3 cr	3 hrs	L-4	S-1
CBOT 412: Plant Physiology and Ecology(II)-Practical	2 cr	3 hrs	”	”
Elective:				
CBOT 421: Crop Physiology-Theory	2 cr	2 hrs	L-4	S-2
CBOT 422: Crop Physiology-Practical	2 cr	3 hrs	”	”
CBOT 423: Plant Biodiversity & Conservation-Theory	2 cr	2 hrs	L-4	S-2
CBOT 424: Plant Biodiversity & Conservation- Practical	2 cr	3 hrs	”	”

Level-2, Semester-1

CBOT 211: Plant Morphology, Embryology and Taxonomy- Theory, **3 Credits, 3 hrs/wk**

External morphology of the following crops:

1) Mustard, 2) Jute, 3) Tobacco, 4) Groundnut, 5) Cotton, 6) Onion, 7) Rice, 8) Wheat,
9) Tea, 10) Rubber and 11) Betel leaf.

Cell: Concept, structures and ultra-structures of protoplasmic components of cell, functions of important organelles.

Cell wall: Components and composition of cell wall, patterns of thickening, cell wall organization, plasmodesma, pit structures of simple and bordered pits and their functions, primary pit field.

Tissue: Concept, classification and morphology of meristematic, simple, vascular and secretory tissues, structures and their functions, tracheary elements and sieve elements, vascular bundles and major types, tissue systems-epidermal, procambial & vascular, epidermal appendages. Variations of different tissues in response to stresses and their defense mechanisms against insect pests and diseases.

Primary structure: Concept of primary growth, structures of root and stem of monocot and dicot plants, structures of isobilateral and dorsiventral leaves.
Secondary structure: Concept of normal and anomalous secondary growth, activities of typical vascular cambium, formation of periderm and its functions.
Anatomy of field crops: 1) Rice, 2) Sugarcane, 3) Jute, 4) Cucurbit, 5) Mustard and 6) Lentil.
Embryology: Concept of sporogenesis and gametogenesis in cryptogams, microsporogenesis and microgametogenesis, megasporogenesis and megagametogenesis, pollination, fertilization, parthenogenesis, development of embryo, endosperm, seed and fruit, *in-vitro* fertilization and embryo culture.
Taxonomy: Introduction, concept of taxon and botanic nomenclature, principles and systems of plant classification.
Distinguishing characters of the following families:
1) Gramineae, 2) Leguminosae, 3) Solanaceae, 4) Cucurbitaceae, 5) Compositae, 6) Umbelliferae, 7) Rutaceae, 8)Anacardiaceae, 9) Moraceae, 10) Orchidaceae and 11) Palmaceae.
Economically important plants: Fibre, oil, timber, medicinal, rubber, narcotic and beverage yielding plants & their products of economic importance.

CBOT 212: Plant Morphology, Embryology and Taxonomy. Practical, 2 Credits, 3 hrs/wk
External morphology of the following crops and their relatives: Mustard, onion, groundnut, lentil, brinjal, jute, cotton, cucurbit, sunflower, rice, wheat, maize, sugarcane, coriander, mango, guava, jackfruit, pineapple.
Slide preparation: Sectioning, staining and mounting, temporary and semi-permanent slides, demonstration of microtome and maceration techniques.
Demonstration of the following:
1. Nucleus, nucleolus, plastids, compound middle lamella, primary wall, secondary wall, thickening of cell wall;
2. Parenchyma, collencyma, sclereid, fibre and secretory cells both in transverse and longitudinal sections/macerated materials;
3. Tracheid, vessel, wood fibre, wood parenchyma, sieve cell, sieve tube, companion cell, bast fibre and epidermal appendages and
4. Structure of anther, pollen grain, pollen germination, hand pollination technique, ovary, ovule and placenta.
5. Internal structures of isobilateral and dorsiventral leaves.
Identification: Monocot and dicot seeds and their seedlings.
Anatomy of field crops: Stem and root of maize, rice, cucurbit, groundnut, countrybean and jute; leaves of monocot and dicot plants.
Preparation of herbarium sheet

Text and Reference Books

BDmyd, †gvt Avãyj, 1966, Dw™¢` åYZË¡, †K›`ªxq evsjv Dbœqb †evW©, XvKv|
Carlquist, S. 1961. Comparative plant anatomy. Holt, Rinehart and Winston, New York.
Cobley, L.S. 1956. Introduction to botany of tropical crops. Longmans, London.
Cutter, E.G. 1971. Plant anatomy: experiment and interpretation. Edward Arnold, London.
Cutter, E.G. 1978. Plant anatomy. Vol. 1&2. Edward Arnold, London.
Dutta, A.C. 1975. Botany for degree students. 4th Ed. Oxford Univ. Press, Calcutta.
Eames, A.J. and MacDaniels, L.H. 1949. An introduction to plant anatomy. McGraw-Hill, New York.
Esau, K. 1965. Plant anatomy. John Wiley, New York.
Esau, K. 1977. Anatomy of seed plants. John Wiley, New York.
Fahn, A. 1967. Plant anatomy. Pergamon Press, Oxford.
Gupta, R.K. 1961. Text book of systematic botany. 5th ed. Atea Ram Pub., Delhi.
Hill, A.F. 1952. Economic botany. 2nd ed., McGraw-Hill, New York.
Maheshwari, P. 1950. An introduction to the embryology of angiosperms. McGraw-Hill, New York.
Ohtani, J. 2000. Wood micromorphology. Hokkaido Univ. Press, Sapporo, Japan.
Pandey, B.P. 2000. Economic botany. 6th ed. S. Chand & Co., New Delhi.
Pandey, B.P. 2001. Plant anatomy. Chand and Co., Delhi.
Popham, R.A. 1966. Laboratory manual for plant anatomy. C.V. Mosby, Saint Louis.
Purseglove, J.W. 1963. Tropical crops. Vol. 1&2. Longmans, London.
Rendle, A.B. 1967. The classification of flowering plants. Vol. 1&2. Cambridge Univ. Press, Cambridge.
Sivarajan, V.V. 1991. Introduction to the principles of plant taxonomy. 2nd ed. Cambridge.

DEPARTMENT OF GENETICS AND PLANT BREEDING

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Title	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
GPB 221: Cytology-Theory	2 cr	2 hrs	L-2	S-2

GPB 222: Cytology-Practical	2 cr	3 hrs	”	”
GPB 311: Genetics and Cytogenetics –Theory	3 cr	3 hrs	L-3	S-1
GPB 312: Genetics –Practical	2 cr	3 hrs	”	”
GPB 421: Plant Breeding –Theory	3 cr	3 hrs	L-4	S-2
GPB 422: Plant Breeding –Practical	2 cr	3 hrs	”	”
Elective:				
GPB 411: Plant Biotechnology and Genetic Engineering –T	2 cr	2 hrs	L-4	S-1
GPB 412: Plant Biotechnology and Genetic Engineering –P	2 cr	3 hrs	”	”
GPB 423: Special Plant Breeding – Theory	2 cr	2 hrs	L-4	S-2
GPB 424: Special Plant Breeding – Practical	2 cr	3 hrs	”	”

Level-2, Semester-2

GPB 221: Cytology –Theory, 2 Credits, 2 hrs/wk

1. Plant cell constituents of genetic importance.
2. Principal events of mitosis and meiosis in diploid organisms.
3. Morphological structure of eukaryotic chromosomes and their nomenclature, Prokaryotic chromosomes and thier characteristics.
4. Euchromatin, heterochromatin, allocycly and heteropycnosis.
5. Special types of chromosomes : Polytene chromosome, Lambrush chromosome, B-chromosome, Sex-chromosome, Iso-and Telocentric chromosomes, Diplo chromosome.
6. Effects of different types of physical and chemical agents on chromosomes.
7. Karyotype: Characteristics, variation and its role on speciation.

GPB 222: Cytology - Practical, 2 Credits, 3 hrs/wk

1. Study of mitosis in onion root tip cells.
2. Study of meiosis in the pollen mother cells of onion/maize.
3. Effect of colchicine treatment on onion/garlic root tip chromosomes.
4. Effect of gamma - ray irradiation on onion/garlic root tip chromosomes.

Text and Reference Books

Perry, J. and Appels, R. 1998. Chromosome structure and Function. Plenum press, New York and London.
Verma, P.S. and Agarwal, V. K. 1998. Cytology. S. Chand & Co. Ltd. Ram Nagar, New Delhi.
Burns G.W. 1980. The Science of Genetics 4th ed. Macmillan publishing co. Inc. New York.
Sharma, A. 1991. Chromosomes. Oxford & IBH Pub. Co. New Delhi.
Sharma, A. K. and Sharma, A. 1980. Chromosome Technique- theory and practice 3rd ed. Butterworthes, London.
Swanson, C.P.; Merz, J. and Young, W. J. 1988. Cytogenetics. The chromosome in Division, inheritance and evolution. Prentice Hall of India private Ltd.
Sybenga, J. 1977. General Cytogenetics. North Holland Publishing Co. Amstradam.
Cytologia - International Journal of Cytogenetics and Cell Biology. 1998. Vol. 63 No. (1-2).

DEPARTMENT OF AGRICULTURAL EXTENSION EDUCATION

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Titles	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
AGEXT 221: Fundamentals of Extension, Leadership and Motivation-Theory	3 cr	3 hrs	L-2	S-2
AGEXT 222: Extension Teaching Methods and Aids-Practical	2 cr	3 hrs	”	”
AGEXT 311: Extension Communication and Group Approaches-Theory	2 cr	2 hrs	L-3	S-1
AGEXT 312: Data Collection, Processing and Report Writing-Practical	2 cr	3 hrs	”	”
AGEXT 411: Extension Organization Management-Theory	3 cr	3 hrs	L-4	S-1
AGEXT 412: Extension Programme Planning and Outreach Programme-Practical	2 cr	3 hrs	”	”
Elective:				
AGEXT 413: Extension for Sustainable Agricultural Development Theory	2 cr	2 hrs	L-4	S-**1**

AGEXT 414: Extension for Sustainable Agriculture Development – Practical	2 cr	3 hrs	”	”
AGEXT 421: Community Participation-Theory	2 cr	2 hrs	L-4	S-2
AGEXT 422: Community Participation-Practical	2 cr	3 hrs	”	”

Level-2, Semester-2

AGEXT 221: Fundamentals of Extension, Leadership and Motivation- Theory, 3 Credits, 3 hrs/wk

1. **Extension Education** : Basic concepts of extension, education, and extension education; evolution of extension; and comparative history of agricultural extension in South-east Asia; philosophies, principles, scope and phases of extension work
2. **Learning process** : Elements in the learning process; theories of learning; laws of learning and their implication in extension work; special features of adult learning
3. **Extension teaching process**: Meaning and steps; guides to effective extension teaching; classification of extension teaching methods; procedures, advantages and limitations of extension teaching methods; criteria/factors for selection and use of extension teaching methods.
4. **Teaching aids**: Purpose and classification; selection of appropriate teaching aid
5. **Leadership**: Importance in extension work, types, and qualities of a good leader; different methods for identification; ways of recognizing; methods of organizing and developing local leaders; duties and responsibilities of local and professional leaders; importance of opinion leadership in extension work; opinion leaders and their characteristics.
6. **Fundamentals of motivation in extension : C**oncept of need and motivation; importance of motivation in extension work; ways of motivating extension workers and farmers.
7. **Need theories** : Concept of need; need theories of Maslow, Hertzberg and McGregor; implication of need theories in extension work.

AGEXT 222: Extension Teaching Methods and Aids- Practical, 2 Credits, 3 hrs/wk

1. **Demonstration**: Conducting method and result demonstrations.
2. **Teaching Aids**: Preparation and use of poster, flash cards, leaflets and flip chart.
3. **Overhead projector (OHP) and slide projector**: Working principles and components of OHP and slide projectors; preparation of OHP transparencies and slides; handling of OHP and slide projectors (practice session).
4. **Small group discussion techniques:** Brainstorming, Role Playing, and Philips 66 — procedure and practice.
5. **Delivering a Talk (Lecturing)**: Practice of delivering a talk on an assigned topic.

Text and Reference Books

Beal, G.M., J.M. Bholen and. J.N. Roudabaugh 1972. *Leadership and Dynamic Group Action.* Ames: The Iowa State University Press.

Bhuiya, M.H. 1988. *Krishi Samprasaran Parichiti*, Dhaka Jamuna Printers.

Bhuiya, M.H. and M. A. M. Miah. 1998. *Extension Psychology*, Krishi Lekhak Forum, Dhaka: Colourline Printers.

Dahama, O.P. and, O.P. Bhatnagar 1980. *Education and Communication for Development.2nd. edn*. New Delhi : Oxford and IBH Publishing Co. Pvt. Ltd.

Kashem, M.A. 1992. *Samprasaran Bijnan* (Extension Science). Dhaka : The Bangladesh Packing Press.

Kelsey, L.D, C.C. Hearne 1963. *Cooperative Extension Work*. 3rd edition, Comstock Publishing Associates, New York: Ithaca.

Ray, G.L., 1991. *Extension Communication and Management.* 2nd edition, Naya Prokash Publication, Calcutta, India.

Wilson, M.C. and G. Gallup. 1955. *Extension Teaching Methods.* Federal Extension Service, U.S. Dept. of Agriculture.

DEPARTMENT OF AGRICULTURAL CHEMISTRY

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Titles	*Credit*	Contact hrs/wk	Available at	
			Level	Semester

Compulsory:				
ACHEM 221: Nuclear and Agro-industrial Chemistry –Theory	2 cr	2 hrs	L-2	S-2
ACHEM 222: Nuclear and Agro-industrial Chemistry – Practical	2 cr	3 hrs	”	”
ACHEM 311: Plant Nutrition, Pesticide and Environmental Chemistry – Theory	3 cr	3 hrs	L-3	S-1
ACHEM 312: Plant Nutrition, Pesticide and Environmental Chemistry – Practical	2 cr	3 hrs	”	”
Elective:				
ACHEM 411: Bioenergy – Principles & Practices – Theory	2 cr	2 hrs	L-4	S-1
ACHEM 412: Bioenergy – Principles and Practices –P	2 cr	3 hrs	”	”
ACHEM 421: Micronutrients in Agriculture-Theory	2 cr	2 hrs	L-4	S-2
ACHEM 422: Micronutrients in Agriculture-Practical	2 cr	3 hrs	”	”

Level-2, Semester–2

ACHEM 221: Nuclear and Agro-industrial Chemistry- Theory, 2 Credits, 2 hrs/wk

Nuclear Chemistry : Nuclear stability, radio-isotopes and its application in agricultural research, interactions of radiations with matter, half-life, radiation units, radiation detection, radiation safety, selection of isotopes for tracer studies, sample preparation for isotopic study.

Fertilizer Chemistry:

Manufacturing technology: Choice and purification of feedstocks, manufacturing process of urea, source and manufacturing of OSP, TSP and DAP, types and composition of potash ores, mining, beneficiation of sylvinite ores, secondary and micronutrient fertilizers, mixed, compound, liquid and controlled release fertilizers. Properties of fertilizers, quality control, specifications, compatibility and comparison of commonly used fertilizers.

Chemistry and Technology of Agro industrial Products:

Rubber: Tapping system, composition and coagulation of latex. Classification and properties of synthetic rubber.
Sugar: Condition and quality of sugarcane, manufacture of plantation white sugar, industrial utilization of sugar mill by products.
Tea: Ideal condition for tea cultivation, manufacturing process and change of chemical composition in tea leaves, aroma, tea infusion and liquoring quality of tea.
Water Chemistry: Sources, quality assessment and criteria for drinking, irrigation, poultry, livestock, aquaculture and industrial usage of water, ionic toxicity and plant tolerance, characteristics of water bodies, chemical models of water system and water treatment.

ACHEM 222: Nuclear and Agro-industrial Chemistry- Practical, 2 Credits, 3 hrs/wk

1. Instructions for the use of laboratory chemicals, glasswares and their safety measures.
2. Operation of laboratory equipments-
   a) pH meter b) Electrical conductivity meter c) Spectrophotometer d) Flame emission spectrophotometer and e) Atomic absorption spectrophotometer
3. Manures and fertilizer analysis: Moisture and nutrient contents in cow dung, FYM, poultry manure, green manure, compost, urea, SSP, TSP, DAP, MP, gypsum, zinc sulphate and borax.
4. Water analysis: Surface, ground and rain waters for dissolved constituents and nutrients.

Text and Reference Books

Ayers, R.S. and Westcot, D.W. 1985. Water Quality for Agriculture. FAO Irrigation and Drainage Paper 29 Rev. Rome, Italy.

Comar, C.L. 1985. Radioisotopes in Biology and Agriculture-Principles and Practices. McGraw-Hill Book Company, Inc. New York.

Das, R.K. 1987. Industrial Chemistry, Part-2, Kalyani Publishers, New Delhi, India.

Dhingra, K.C. 1984. Hand Book on Rubber and Rubber Goods Industries. Small Industry Research Institute, New Delhi.

Havlin, J.L.; Beaton, J.D.; Tisdale, S.L. and Nelson, W.L. 1999. Soil Fertility and Fertilizers, 6th edn. Prentice-Hall, Inc., Upper Saddle River, New Jersey, USA.

Hignett, T.P. (ed.) 1985. Fertilizer Manual. International Fertilizer Development Center (IFDC), Alabama, USA.

APHA (American Public Health Association). 1995. Standard Methods for the Examination of Water and Wastewater. 19th edn. Water Environmental Federation, Washington, DC 20005, USA.

Barnes, A.C. 1974. The Sugarcane. Intersciences Publishers Inc; New York.

Chase, G.D. and Rabinowitz, J.R. 1984. Principles of Radioisotopes Methodology. Burgess Publishing Company; USA.
Eden, T. 1987. Tea. Longmans, Great Britain.
Garner, W.W. 1981. The Production of Tobacco. McGraw Hill Book, London.
Hesse, P.R. 1994. A Text Book of Soil Chemical Analysis, CBS. Publishers and Distributors, Bhola Nath Nagar, Shahdara, New Delhi-110032, India.
James, D.W.; Hanks, R.J. and Jurinak, J.J. 1982. Modern Irrigated Soils. John Wiley and Sons, Inc. New York.
Mathur, R.B.L. 1987. Hand Book of Cane Sugar Technology. Oxford and IBH Publishing Co. Calcutta.
R.R.I.M. 1980. Tapping, Tapping Systems and Yield Stimulation of Hevea. Malayasia.
Ramulu, U.S.S. 1982. Isotopes in Agriculture. Oxford and IBH Publishing Co. New Delhi.
Shmuk, A.A. 1983. The Chemistry and Technology of Tobacco. Vol I and II. Pishepromizdar.

DEPARTMENT OF BIOCHEMISTRY

Types of courses available for B.Sc.Ag. (Hons.) degree in the semester system

Course No. and Title	*Credit*	Contact hrs/wk	Available at	
			Level	Semester
Compulsory:				
BCHEM 121: Chemistry of Biomolecules-Theory	2 cr	2 hrs	L-1	S-2
BCHEM 122: Chemistry of Biomolecules-Practical	2 cr	3 hrs	”	”
BCHEM 211: Metabolism and Human Nutrition-Theory	3 cr	3 hrs	L-2	S-1
BCHEM 212: Metabolism and Human Nutrition-Practical	2 cr	3 hrs	”	”
Elective:				
BCHEM 411: Fundamentals of Molecular Biochemistry and Biotechnology- Theory	2 cr	2 hrs	L-4	S-1
BCHEM 412: Fundamentals of Molecular Biochemistry and Biotechnology-Practical	2 cr	3 hrs	”	”

Level-2, Semester-1

BCHEM 211: Metabolism and Human Nutrition-Theory, 3 Credits, 3 hrs/wk

Bioenergetics: Free energy, entropy and enthalpy. Exergonic and endergonic reaction, ADP-ATP cycle. ATP as universal currency of energy in biological systems. Anabolism and catabolism.
Digestion and absorption: Food nutrients.
Carbohydrate Metabolism: Glycolysis and alcoholic fermentation. Krebs cycle. Electron transport chain. Shuttle systems. Pentose phosphate pathway. Gluconeogenesis, Biosynthesis of sucrose and starch.
Nucleic acid: Replication and transcription of genetic code.
Protein metabolism: Transamination, deamination, decarboxylation, deamidation. Assimilation of ammonia in plants. Nitrogen cycle. Urea cycle. Protein synthesis – translation of genetic message.
Fat Metabolism: Beta, alpha and omega oxidation of fatty acids. Glyoxalate Pathway. Fatty acid biosynthesis.
Vitamins and minerals: 0ccurrence, biochemical functions and deficiency symptoms, RDA.
Food protein quality evaluation: Biological value, PER, NPU etc.
Nutrient contents and availability: Basic food groups; Cereals, legumes, oil seeds, fruits, vegetables etc. Antinutritional factors, Dietary fibre.
Energy: Requirement according to age, sex and weight. Basal metabolic rate, respiratory quotient, balanced diet.
Nutrition and agriculture: National nutritional policy. Crop diversification in relation to human nutrition.

BCHEM 212: Metabolism and Human Nutrition-Practical, 2 Credits, 3 hrs/wk

Determination of isoelectric pH
Biuret method of protein estimation.
Fehlings and Folin-Wu methods of glucose estimation.
Determination of saponification value, iodine value and acid value of fats.
Separation of amino acids by paper chromatography.
Separation of sugar by TLC
Extraction and estimation of DNA
Extration of albumin and globulin from plant sample
Extraction and estimation of plant pigments.
Assay of glucose oxidase.

Text and Reference Books

Applied Human Nutrition.F. Ann Walker. Ellis Horwood Limited, West Sussex, England, 1990.
Principles of Biochemistry, Albert L. Lehminger 2nd Edition. Kalyani Publishers. Ludhiana, New Delhi, 1994.
Biochemistry, Lubert Stryer, Publshed by S.K. Jain for CBS Publishers and Distributors, 485 Jain Bhawan, Bhola Nath Nagar, Delhi, India, 1986.
Hand Book of Food and Nutrition. M. Swasminathan Ganesh and Company, Madras, India, 1977.
Harper's Review of Biochemistry. David W. Martin, Jr. Peter A. Mayes, Victor W. Rodwell and Davy' K. Granner. 20th Edition, 1983. Lange Medical Publication. Drawer L. Los, Altos, California, USA,
Nutrition in Health and Disease. S. Helen Mitchell. J.B. Lippincott Company, Philadelphia, 1976.
0utlines of Biochemistry, Eric E. Conn, Paul K. Stumpf, George Brueming and Roy, H. Doi. John Wiley and Sons, New York, 1995 (5th edition).
Text Book of Biochemistry. Edward S. West, Wilber R. Todd, Haward S. Mason and John T. Van Bruggan. 4th Edition, 1966. The MaCmillan Company. Collier-MaCmillan Ltd. London.
An introduction to practical Biochemistry.Davit T. Plummer. Tata McGraw-Hill Publishing Company Limited, New Delhi, 1995.
Biochemical Calculations. How to Solve Mathematical Problem in General Biochemistry. Irwin H. Segel. John Wiley and Sons, Inc. New York, 1968.
Biochemistry Laboratory Manual. F. M. Strong. WM.C. Brown Company Publishers, USA, 1965.
Biochemistry Laboratory Technioques. Sterling Chaykin. Wiley Eastern Private Limited, New Delhi, 1970.
Experimental Biochemistry. A Laboratory Manual. Gerald Litwack. John Liley and Sons. Inc, New York, 1960.
Official Methods of Analysis. Association of Official Analytical Chemists (AOAC), Washington D.C., 1990.