

BANGABANDHU SHEIKH MUJIBUR RAHMAN AGRICULTURAL UNIVERSITY

Undergraduate catalogue for BS (Agriculture)

1. INTRODUCTION

The Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU) was established in 1998 (Act No. 16 of 1998). Initially it was established as Bangladesh College of Agricultural Sciences in 1983. Subsequently the college was renamed as Institute of Postgraduate Studies in Agriculture (IPSA) in 1994 (Act No. 1 of 1994) through the tripartite collaboration and co-operation of the Governments of Bangladesh, Japan, and the U.S.A. BSMRAU, after a decade of its successful operation of Graduate Program, launched Undergraduate Program in 2005 to offer Bachelor of Science degree in Agriculture (BS Agriculture). The Faculties are committed to uphold the academic excellence of the University at all levels, and are always ready to extend their cooperation to the students.

The University is located at Salna, Gazipur about 10 km north-west of the Gazipur district headquarters and about 40 km north of Dhaka, the capital city of Bangladesh. The campus covers an area of 187 acres (76 ha) land including about 50 acres (20 ha) of well developed experimental farm area. Located in a beautiful rural setting in between Joydebpur Chawrasta and National Park of Rajendrapur, surrounded by the renowned Sal forest of the Madhupur Tract and characterized by the topographical diversity with undulated land, BSMRAU maintains a unique, calm and nonpolitical campus most suitable for academic pursuit.

The University is committed to the policy of providing educational opportunities to all eligible students regardless of their economic or social status, and will not discriminate on the basis of race, color, sex, creed, age, marital status or national origin.

2. GOAL AND OBJECTIVES

The goal of the University is to contribute to the growth and development of the farm

economy in Bangladesh by providing intellectual leadership and by producing quality graduates in different fields of agriculture. The University has strong programs of undergraduate and graduate education; research and outreach activities designed to produce skilled manpower and improve the economic wellbeing of farmers and to accelerate rural development.

The main objectives of the University are:

- * to serve as a "Center of Excellence" for agricultural education leading to BS, MS and PhD degrees;
- * the academic program is designed to provide an education consistent with international standard.
- * to conduct basic and applied research to generate appropriate and sustainable technologies in the field of agriculture.
- * to disseminate and transfer generated technologies to the end users through training and outreach activities.
- * to undertake research programs having primary focus on local problems within the national agricultural research framework with emphasis on basic research.

3. ORGANIZATION

Bangabandhu Sheikh Mujibur Rahman Agricultural University is a statutory organization comprising Chancellor (Honorable President of the People's Republic of Bangladesh), Vice-Chancellor, Treasurer and the members of Syndicate, Academic Council and other statutory officers. The University management structure comprises four wings: Administrative, Academic, Research and Outreach. Vice-Chancellor provides leadership in achieving the objectives of the University. The University Grant's Commission (UGC) monitors and evaluates University activities. The UGC also processes and recommends to the higher authority the annual budget and other financial requirements and development projects for their approval.

3.1. OFFICERS OF THE UNIVERSITY

Besides the Chancellor and Vice-Chancellor, followings are the other officers, who are at present, actively involved in carrying out the day to day activities of the University.

1. Deans of the Faculties and Dean of Graduate Studies
2. Treasurer
3. Registrar
4. Heads of the Departments
5. Director (Research)
6. Director (Outreach)
7. Director (Student's Welfare)
8. Director (Planning & Development)
9. Director (Transport)
10. Proctor
11. Provosts (BS Student Dormitory & Student's Dormitory-Women's Wing)
12. Head, Library
13. Chief Engineer (Presently represented by Executive Engineer)
14. Chief Medical Officer (Presently represented by Senior Medical Officer)
15. Farm Manager

3.2. ADMINISTRATION WING

The administration at BSMRAU is headed by a Vice-Chancellor who is the Chief Executive of the University. He is assisted by a Registrar in administrative affairs and advised by the Treasurer in financial matters.

3.3. ACADEMIC WING

The Academic Wing consists of 19 academic departments and 01 academic Unit. The Dean, Faculty of Agriculture, coordinates the academic activities of the faculty of Agriculture at undergraduate level, while the Dean of Graduate Studies coordinates the postgraduate academic programs. The Department Head administers the academic programs of the respective department.

The 18 Departments and 01 Unit are: Agricultural Economics (AEC), Agricultural Extension and Rural Development (AER), Agroforestry and Environment (AFE), Agronomy (AGR), Crop Botany (CBT), Entomology (ENT), Genetics and Plant

Breeding (GPB), Horticulture (HRT), Plant Pathology (PLP) and Soil Science (SSC), Agro-Processing (AGP), Biotechnology (BTL), Biochemistry (BCH), Agricultural Engineering (AGE), Bioenvironmental Science (BES), Statistics (STT), Computer Science & Information Technology (CST), Agribusiness (AGB) and the academic unit named as Seed Science and Technology (SST).

3.3.1. BOARD OF STUDIES

Each academic department has a Board of Studies (BOS) comprising all faculty members of respective department/unit and an external expert member of the same discipline. The BOS is chaired by the head of the respective department/unit. The BOS reviews departmental academic programs, course requirements, course offering plan and related matters.

3.3.2. LECTURE HALL AND LABORATORY

Each lecture Hall is well equipped with modern audio-visual aids and sounds system. Each department has adequate number of laboratories with sophisticated modern equipments.

3.3.3. Computer Center

The computer center is equipped with sufficient number of microcomputers and peripheral equipments. It provides training facilities for students and staff.

3.4. UNDERGRADUATE PROGRAM AT BSMRAU

BSMRAU at present offers the Bachelor of Science in Agriculture [BS (Agriculture)] degree in addition to BS (Fisheries) and Doctor of Veterinary Medicine (DVM) under its undergraduate program. A brief description of the BS (Agriculture) program is presented below:

3.4.1. BS (AGRICULTURE) PROGRAM

BS (Agriculture) is a 4-year program comprising 54 courses of 240 credits spread over 12 terms. The program comprises course credit system involving course work with regular class assignments, performance

evaluations through three quizzes, two midterms and the final examination during and at the end of each 12-week term. An academic year is divided into three academic terms namely Summer, Autumn and Winter. Each academic term consists of 12 weeks.

3.4.2. ADMISSION TO BS (AGRICULTURE) PROGRAM

Admission Requirements

To be eligible to apply for admission to BS (Agriculture) program the candidate must have passed SSC (Science Group) and HSC (Science Group) examinations or equivalent examinations from a recognized Board or Institution. The candidate must have an acceptable GPA in both SSC and HSC as mentioned in the “Admission Notification” as decided by the Admission Committee of the University.

How to Apply

To get admission into BSMRAU for Bachelor of Science in Agriculture Program a candidate needs to wait for “Admission Notification”. The “Admission Notification” is published in the Daily Newspapers. and through electronic media.

Preliminary Screening

Applications received through prescribed forms or mobile phone companies within the deadline are subject to preliminary screening to make a shortlist of the candidates eligible for sitting the Admission Test.

Admission Test

Admission Test is taken in Physics, Chemistry, Biology, English, Mathematics and General Knowledge based on HSC syllabus. A total of 100 points is allotted for Admission Test which is conducted on MCQ basis. Subject-wise point distribution in Admission Test is as follows:

| Distribution of points | |
|------------------------|--------|
| Subject | Points |
| Biology | 20 |
| Chemistry | 20 |
| Physics | 20 |

| | |
|-------------------|------------|
| Mathematics | 15 |
| English | 15 |
| General Knowledge | 10 |
| Total | 100 |

Scoring for Admission

Merit list is prepared based on the combination of test results and academic records. A total of 200 points are distributed as shown in tabular form below:

| Exam | Points | Remarks |
|----------------|--------|----------------------------|
| Admission Test | 100 | - |
| SSC/Equivalent | 40 | Excluding Optional Subject |
| HSC/Equivalent | 60 | Excluding Optional Subject |
| Total= | 200 | - |

The candidate’s earned GPA in SSC/equivalent and HSC/equivalent examinations are multiplied by 8 and 12, respectively and added to the point obtained in the Admission Test to compute the total score of the candidate.

Publication of Admission Test results

Based on merit, the required numbers of candidates will be selected for admission. List of the selected candidates will be published. A separate waiting list of the same number of candidates will also be published.

Medical Test

Successful candidates must undergo medical test for physical fitness. Any candidate found to have diseases that may impair the candidate’s academic activities is considered to be unfit for admission.

Admission of selected candidates

Candidates selected on merit will be admitted on specific date and time mentioned in the Admission Notification. Selection is cancelled if the candidate fails to get admission on the scheduled date and time. Selected candidates must submit the original Mark Certificates/Transcripts of both SSC and HSC examinations at the time of admission.

3.4.3. Academic Policy

Once admitted, the students are supposed to follow the academic policies as mention below:

English is the medium of instruction at BSMRAU. The study at BSMRAU comprises Term based Course Credit System, which the students can understand going through the following points thoroughly:

- (i) **The Course Credit System:** The course credit system involves course work with regular classes, assignments, unannounced quizzes, and pre-scheduled 2 midterms and final examinations. In this system, subject matter is taught in modules (courses) of reasonably homogenous subject matter, The students will receive “Grades” for each of the courses taken to indicate the extent of his/her mastery of the subject matter taught in each respective course.
- (ii) **Term:** An academic year is divided into three terms – Summer, Autumn and Winter. Each term consists of 12 (twelve) effective weeks.
- (iii) **Credit:** One class hour in a week during a term shall be considered as one credit. For laboratory classes, two class hours shall be considered as one credit.
- (iv) **Course:** A course is a set of topics delivered to the students by lectures, contact hours and practical exercises on a specific subject incorporated in the approved curricular layout and developed by Board of Studies (BOS) to offer in a term.
- (v) **Course Coding:** Each course is designated by 3 (three) capital letters and a 3-digit number. The 3 letters indicate the department offering the course. Of the three digits, the first digit indicates academic year in which the course is normally offered. The next two digits indicate the offering term, where 01-30 stand for First term, 31-60 for Second term and 61-99 for Third term.

3.5. Course and Credit Requirements

For the BS (Agriculture) degree a student will have to complete a total of 54 courses of 240 credits. The curricular layout covering the courses arranged in different terms over a period of 4 years are shown in Table 1.

3.6. Duration of Program

The duration of BS (Agriculture) program is 12 (twelve) terms over a period of 4 years. If a student passes all the courses in each term as per the curricular layout he/she can have the degree in 12 terms. But if a student obtains ‘F’ grade in any course, which he/she must repeat; or obtains ‘D’ grade, which he/she may like to repeat for improvement; or if a student misses any term for any of his/her personal justified reasons, he/she requires more than 12 terms. Under such situation he/she may be allowed an extension of maximum 3 (three) terms. For having such extension a student must apply before the end of 12th term to the Dean describing his/her status and seeking with proper justification for the extension of required number of terms. Otherwise, after 12 terms his/her admission shall automatically stand terminated. Similarly, after having extension of 3 terms, if a student cannot fulfill all the requirements for the degree in a total of 15 terms, his/her admission shall also automatically stand terminated. Under no circumstances, a student shall be allowed more than a total of 15 terms for the degree.

3.7. Course Enrollment

- (a) The student must enroll course (s) as per the curricular layout on the day of admission paying required enrollment fees.
- (b) In the subsequent terms, students shall enroll course (s) during the 10th and 11th week of the current term paying regular fees. Late enrolment with late fee is allowed up to the previous day of the forth coming term. However, a student who is on probation shall not be allowed to enrolled courses for the next term be for publication of the results of current term.

- (c) If a student obtains 'F' or 'W', which he/she must repeat and/or 'D' grade, which he/she likes to improve he/she shall select course(s) that best fit his/her course offering plans and course schedules for all batches including his/her original batch. In this case, he/she can enroll a maximum of 6 (six) courses while enrolling a minimum of 4 (four) courses is a must in a term. For enrolling, a student must consider the course offering plans and class routine, which shall be published well ahead of the day of enrollment. In selecting the course for repetition, a student must be very careful. For example, if a student got 'F' grade in one course and 'D' grade in another, he/she must repeat the course with 'F'.

Table 1. Curricular Layout for BS (Agriculture) Program.

1st year

| Summer Term | Credit | Autumn Term | Credit | Winter Term | Credit |
|--|---------------|--------------------------------------|------------------|--|---------------|
| AGR 101 Fundamentals of Agronomy | 3+1.5 | AEC 135 Agricultural Economics | 3+00 | AGR 175 Fundamental of Cereal Crop Production | 3+1.5 |
| CBT 110 Plant Taxonomy & Economic Botany | 3+1.5 | ANS 131 Introductory Animal Science | 3+1.5 | AER 165 Fundamentals of Agricultural Extension & Rural Development | 3+1.5 |
| STC 101 Fundamentals of Computer Science | 3+1.5 | BCH 135 Biochemistry I | 3+1.5 | SSC 165 Soil Chemistry | 3+1.5 |
| FIS 105 Introduction to Fish Culture | 3+1.5 | HRT 140 Fundamentals of Horticulture | 3+1.5 | AGE 180 Farm Mechanics | 3+1.5 |
| Total Cr. Hr. | 18 (12+6) | | 16.5 (12+4.5) | | 18 (12+6) |

Total Credit Hrs. for 1st year = 52.5 (36+16.5)

2nd Year

| Summer Term | Credit | Autumn Term | Credit | Winter Term | Credit |
|---|------------------|--|------------------|--|------------------|
| AGR 205 Weed Science | 3+1.5 | CBT 255 Plant Anatomy & Embryology | 3+1.5 | AER 265 Rural Sociology & Educational Psychology | 3+1.5 |
| ENT 215 Insect Morphology | 3+1.5 | HRT 255 Vegetable & Spices Production | 3+1.5 | ENT 265 Insect Ecology | 3+1.5 |
| GPB 203 Cytology | 3+1.5 | ENT 250 Insect Taxonomy & Systematics | 3+1.5 | BCH 265 Biochemistry-II | 3+1.5 |
| PLP 212 Fundamentals of Plant Pathology | 3+1.5 | AGR 255 Agro-climatology | 3+1.5 | HRT 280 Fruits and Plantation Crop Production | 3+1.5 |
| SSC 225 Soil Physics | 3+1.5 | GPB 235 Elementary Genetics Evolution and Biodiversity | 3+1.5 | STC 270 Basic Statistics | 3+1.5 |
| Total Cr. Hr. | 22.5 (15+7.5) | | 22.5 (15+7.5) | | 22.5 (15+7.5) |

Total Credit hrs. for 2nd year = 67.5 (45+22.5)

3rd Year

| Summer Term | Credit | Autumn Term | Credit | Winter Term | Credit |
|---|------------------|--|------------------|---|--------------|
| GPB 310 Introductory Cytogenetics | 3+1.5 | GPB 355 Principles of Plant Breeding | 3+1.5 | AEC 365 Agricultural Marketing & Finance | 3+00 |
| AER 301 Management of Agricultural Extension Organization | 3+1.5 | AFE 350 Silviculture | 3+1.5 | HRT 370 Floriculture and Landscape Horticulture | 3+1.5 |
| AFE 301 Fundamentals of Agroforestry and Environment | 3+1.5 | PLP 340 Diseases of Field Crops | 3+1.5 | AGR 375 Production of Pulses, Oilseeds & Industrial Crops | 3+1.5 |
| AGR 325 Seed Science and Technology | 3+1.5 | SSC 355 Soil Fertility and Management | 3+1.5 | ENT 370 Economic Entomology | 3+1.5 |
| PLP 315 Principles of Plant Pathology | 3+1.5 | CBT 350 Plant Physiology | 3+1.5 | SSC 365 Soil Microbiology | 3+1.5 |
| Total Cr. Hr. | 22.5 (15+7.5) | | 22.5 (15+7.5) | | 21 (15+6) |

Total Credit hrs, for 3rd year = 66 (45+21)

4th Year

| Summer Term | Credit | Autumn Term | Credit | Winter Term | Credit |
|---|--------------|---|--------------|---|--------------|
| HRT 415 Propagation & Nursery Management | 3+1.5 | AER 425 Communication & Technology Transfer | 3+1.5 | AGR 475 Irrigation & Farm Management | 3+1.5 |
| STC 405 Information and Communication technology | 3+1.5 | SSC 440 Agricultural & Industrial Chemistry | 3+1.5 | PLP 480 Post-harvest Pathology | 3+1.5 |
| SSC 401 Soil Survey, Classification & Conservation | 3+1.5 | PLP 440 Disease of Hort. And Plantation Crops | 3+1.5 | CBT 465 Plant Ecology | 3+1.5 |
| BTL 410 Introductory Biotechnology | 3+1.5 | ENT 440 Insect Pest Management | 3+1.5 | GPB 465 Methods of Plant Breeding | 3+1.5 |
| Total Cr. Hrs. | 18 (12+6) | | 18 (12+6) | | 18 (12+6) |

Total Credit hrs. for 4th year = 54 (36+18)

Total Course = 54, Total Credit hrs. = 240 (Theory 162 cr. Hrs. + Practical 78 cr. Hrs)

4. Class attendance

The students are expected to attend all scheduled classes, course meetings and exercises. In order to qualify for final examination, stipend, scholarship, fellowship and/or any other financial assistance, a student must maintain a minimum of 80% class attendance in all courses taken in the term.

5. Examination

The students achievements in a course shall be evaluated based on his/her performance in class tests, quizzes, midterms, final examinations, laboratory study, assignments, presentation and regularity etc.

- a) In theory, there shall be three quizzes, two midterms and one final examination. The duration of each midterm examination shall be one class hour (50 minutes) and that of the final examination shall be two hours (120 minutes). One course in a term shall be evaluated on the basis of 150 points out of which - 100 points for theory and 50 for practical examination. The points allotted for three quizzes is 10%, two mid-term examinations carry 50% (25% each) and the final examination holds 40% of the total points allotted.
- b) In practical part of a course, if any, there shall be field and laboratory study during classes carrying 60%, and one final examination carrying 40% of the total points allotted.
- c) The 1st and 2nd mid-term examinations, scheduled by the Dean, Faculty of Agriculture, shall be in 4th and 7th weeks of the term, respectively. The final examinations of theory and practical shall be given on 11th and 12th week of the term, respectively. One invigilator for every 25 students or fraction thereof will be assigned by the Dean, Faculty of Agriculture to conduct two midterms and theory part of final examinations. Similarly, one invigilator for each course will be assigned to conduct practical examination.

- d) All examinations will be conducted, administered and evaluated by the course instructor (s). The course Instructor (s) will also evaluate reports and other assignments.
- e) The decision of the course Instructor (s) in terms of evaluation of a student's performance in a course is final. If any student feels that justice was not done to him/her in grading the course, he/she may submit a petition to the Dean, Faculty of Agriculture through departmental head offering the course. If the petition is acceptable to the Dean, he/she may form a committee to review the grade.
- f) When a student is unable to appear at a mid-term examination due to serious illness or accident he/she should inform it to the course Instructor. In such cases, a student must appear at the examination before the beginning of 12th week of the term after paying an extra fee as decided by the authority for holding examination. Such a chance may be given to a student by the Instructor with prior information to the Dean, Faculty of Agriculture with a reduction of 20% points from the total points allotted for that examination.
- g) If a student miss any quiz, it will not be repeated.

6. Grading Results

The grading system consists of 10 basic grades. The ranges of numerical values against the letter Grades along with Grade Points are as follows:

| Numerical Value | Letter Grade | Grade Points |
|-----------------|---------------|--------------|
| 80% and above | A+ (A plus) | 4.00 |
| 75% to 79.99% | A (A regular) | 3.75 |
| 70% to 74.99% | A- (A minus) | 3.50 |
| 65% to 69.99% | B+ (B plus) | 3.25 |
| 60% to 64.99% | B (B regular) | 3.00 |
| 55% to 59.99% | B- (B minus) | 2.75 |
| 50% to 54.99% | C+ (C plus) | 2.50 |
| 45% to 49.99% | C (C regular) | 2.25 |
| 40% to 44.99% | D | 2.00 |
| Less than 40% | F | 0.00 |

In the transcript, the Letter Grade and the corresponding Grade Points and finally, cumulative GPA will be shown. The grade 'D' is the minimum acceptable passing grade in a course. The minimum GPA for continuing as a student is 2.50. Other grades are 'E', final examination not taken; and 'I', incomplete accomplishment. When a student fails to remove 'E' within specified timeframe, grade 'E' will automatically be converted to 'W'.

6.1. Removing 'E', 'I' and 'W'

- (i) A student must remove an 'I' grade before beginning of the next term. To remove an 'I' grade a student must complete the deficiency within the time granted by the Instructor. If an 'I' grade is removed in the allotted time, the Instructor shall submit the appropriate grade. If the deficiency is not removed before beginning of the next term and the time allotted by the course Instructor, the Instructor shall submit a grade ('A' to 'F') other than 'I' based on the performance of the student.
- (ii) The student must remove an 'E' grade before beginning of the next term. To remove an 'E' grade a student must apply to the Dean, Faculty of Agriculture through the course Instructor offering the course for permission showing acceptable reason (s) for missing the final examination. If an 'E' grade is not removed before beginning of the next term, it will be changed to 'W'.
- (iii) To remove 'F' and 'W' grades the student must repeat the course(s) in any term before graduation. The student must enroll the course(s) for repeating from course plans offered for batch(es) other than his/her original year batch. Remember, a student must enroll at least 4 courses and a maximum of 6 courses in a term. He/she can enroll the course(s) for repetition only in addition to courses of his/her original course

schedule. He/she can also consult any of his/her teachers or the Academic Counselor in enrolling course (s) for repetition. But he/she must consult with the Dean's office much ahead of the term and apply for permission in prescribed form.

- (iv) When a student repeats a course having 'W' and obtain a grade (minimum acceptable grade), the grade 'W' shall be erased from his/her transcript.
- (v) The credits in the repeated courses shall be considered only once for calculating GPA and for fulfillment of graduation requirements. In case of repeated course(s) with grades 'D' and 'F', the average of lower and improved values of grade points shall be used in GPA calculation. However, both the lower and improved grades shall appear in the transcript.

6.2. Grade Point Average

- (i) Grade point average (GPA) is the weighted average of the grade points obtained in all the courses passed by a student. Thus, GPA is computed by dividing the total grade points (GPs) accumulated up to date by the total credits earned as follows:

$$GPA = \frac{\Sigma(\text{Grade points} \times \text{Credits})}{\Sigma \text{Credits}}$$

- (ii) **GPA calculation:** In GPA calculation the following basic points should be taken into consideration:
 - The corresponding numerical grade point against each letter grade.
 - The credits in the repeated courses shall be considered only once for calculating GPA and for fulfillment of graduation requirements.
 - The credits should be multiplied by respective grade points, all the products should be summed-up and then the total or cumulative Grade Points should be divided by the total or cumulative of credits to obtain the cumulative GPA.

6.2.1. Grading system

The letter grades A+, A, A-, B+, B, B-, C+, C, D and F are numerically equal to 4, 3.75, 3.50, 3.25, 3, 2.75, 2.50, 2.25, 2 and 0 (zero), respectively. Say a student enrolled 5 courses such as course AGR 101, CBT 110, SSC 101, STC 101 & FIS 105 in 1st term. All courses are of 4.5 (3+1.5) credits each. He/she obtained A+, B- and C grades in AGR 101, CBT 110 and SSC 101, respectively, and D and F grades in STC 101 & FIS 105, respectively. Now the total grade points of the five courses shall be $4 \times 4.5 + 2.75 \times 4.5 + 2.25 \times 4.5 + 2 \times 4.5 + 0 \times 4.5 = 49.51$, and total credits shall be $4.5 + 4.5 + 4.5 + 4.5 + 4.5 = 22.5$. The calculated GPA for the 1st term shall be $49.51 \div 22.5 = 2.20$. The same is shown in tabular form below:

| Course | Credits | Grade Obtained | Grade Points | Grade Points for the Courses |
|---|---------|----------------|--------------|------------------------------|
| Col. 1 | Col. 2 | Col. 3 | Col. 4 | Col. 5 |
| 1 | 4.5 | A+ | 4.00 | 18.00 |
| 2 | 4.5 | B- | 2.75 | 12.38 |
| 3 | 4.5 | C | 2.25 | 10.13 |
| 4 | 4.5 | D | 2.00 | 9.00 |
| 5 | 4.5 | F | 0.00 | 0 |
| Total= | 22.5 | | | 49.51 |
| GPA for the 1st term = $49.51 \div 22.5 = 2.20$ | | | | |

Thus the cumulative GPA or GPA for all the courses including the repeated courses so far completed can be calculated in this system.

6.2.2. Submission of Grade Report and Displaying.

The course Instructor(s) shall submit the grades of the course to the Dean, Faculty of Agriculture within 10th day after completion of the term final examination. The grade report after being compiled by Dean's Office shall be displayed on the Notice Board of the Faculty within a week of submission of grades by the Instructors.

6.2.3. Correction of Erroneous Grades

Erroneous grade given by an Instructor, if any, may be corrected and submitted by the Instructor to the Dean, Faculty of Agriculture before beginning of the next term. Therefore, if a student find any error in his/her grade, he/she should immediately report to his/her Instructor directly for its correction.

7. Academic Deficiency and Academic Probation

(a) If a student achieves a GPA of less than 2.5 in any term he/she shall be placed on probation in subsequent term. Such probation shall not be allowed for more than two consecutive terms just after the term of falling GPA below 2.5. He/she must raise his/her GPA to 2.5 within next two consecutive terms. Otherwise, his/her admission shall stand automatically terminated.

b) The Dean, Faculty of Agriculture, shall prepare a grade report at the end of each term. The report shall be notified for all concerned persons. Reviewing the grade reports at the end of each term, the Dean, Faculty of Agriculture, shall communicate the academic deficiency to the student, if any.

8. Repeating Course

Courses with 'W' or 'F' grade must be repeated in any term before the final term of graduation and must obtain a minimum acceptable grade of 'D'. A course with 'D' grade may be repeated for improvement. Such repetition to improve GPA may be allowed only once for a course and for a maximum of 5 courses. The credits in the repeated courses shall be considered only once for calculating GPA and for fulfillment of graduation requirements. In case of repeated course(s) with grades 'D' and 'F', the average of lower and improved values of grade points shall be used in GPA calculation. However, both the lower and improved grades shall appear in the transcript.

9. Academic Discipline

- (a) The administration of the classes and tests shall rest upon the course Instructor. When any evidence of a student academic dishonesty comes to the notice of the course Instructor, the Instructor shall document the incidence and permit him/her to provide an explanation.
- (b) Considering the seriousness of the incidence, the Instructor may impose any academic penalty including giving an 'F' grade after informing the student of the action taken. The Instructor must report the incidence to the Dean, Faculty of Agriculture, through head of the department offering the course. If he/she is penalized, he/she may appeal to the Dean through the Departmental head of the concerned course for grade.

9.1 Disciplinary Measures

(a) Student Disciplinary Committee deals with issues that arise from student's misconduct. Any of a student's behavior that disregards/ disobeys the norm, policy, procedure and rules of the University will be treated as misconduct.

(b) If a student has been suspended or expelled for academic deficiencies or serious breach of discipline, he/she shall be deprived of all the privileges of the University and readmission.

9.2 Petitions and Appeals

The student may occasionally encounter special problems whose proper solutions may require deviation from the Academic regulations and procedures or policies. Requests for such deviations in the regulations must be presented to the Dean, Faculty of Agriculture. Petitions received by the Dean shall be forwarded to the proper committee or office for review and suggest appropriate action and place it before the Academic Council.

10. Conferral of Degree

The degree of Bachelor of Science in Agriculture shall be conferred on a student upon his/her fulfillment of the following requirements:

- (a) The student must complete the required credit hours before graduation.
- (b) The student must maintain a minimum GPA of 2.5 or above for graduation.
- (c) The student must clear all fees and dues of the University before graduation.

11. Application for Graduation and Award of Degree

- (a) Upon fulfillment of the academic requirements for the degree of Bachelor of Science in Agriculture, a student shall have to apply in prescribed Form to the Dean, Faculty of Agriculture. On the recommendation of the Academic Council, the Dean shall issue provisional certificate.
- (b) The Syndicate upon recommendation of the Academic Council shall approve conferral of the degree.

12. Cancellation of Admission

A student's admission shall be cancelled if he/she fails to:

- * complete first three consecutive terms after admission (for cancellation of admission a student must pay Tk. 5,000/-),
- * maintain a minimum GPA of 2.5 for more than two consecutive terms after probation,
- * fulfill all the requirement for the degree within 12 terms or 15 terms upon permission of extension, and
- * comply with the regulations of the University.

13. STUDENT CONDUCT, PUNITIVE MEASURES AND APPEALS

Followings are the policies related to student conduct, punitive measures and student grievances.

13.1. STUDENT CONDUCT

When a student enrolls in the University, he/she assume an obligation to conduct himself/herself in a manner compatible with the University's function as an educational institution. Otherwise he/she shall have to face consequences for any of his/her misconducts as prescribed in the *ÖQvÎ-k,,•LjvKw gwUi ÿgZv I Kvh©vejx Aa`v‡‘kÓ* (Chhatra -Srinkhala Committeeer Khomota 0 Karjaboli Odhyadesh of Bangabandhu Sheikh Mujibur Agricultural University) and the Ordinance for the Proctorial System. According to the Ordinance, any of his/her following acts and deeds would be considered as misconduct:

1. If he/she disobliges any order, regulations or rules/norms, or revolts against or defames any reasonable decision or Ordinance of the University Authority, or misbehaves with any teacher, officer or staff of the University or lodge any application with false complaint (s) against any person of the University, or perform any such activity that amounts to committing subversive to the University's discipline;
2. If he/she plagiarisms morally or with character, or remains involved in displaying, preserving or distribution of pornography or objectionable films; carries, drinks, preserves or distributes/supplies narcotics and/or alcohols; carries, preserves, distributes/supplies or use arms, explosives, sharp knives or sticks;
3. If he/she carries or preserves acid or alike or any other harmful chemicals, or intentionally throw such chemicals at any student;
4. If he/she alone or in group gets involved in clash among themselves or provokes others to get involved in clash or commits any anti-disciplinary offence;
5. If he/she alone or in group calls strike, rally, meeting or assembly, or resists any student to attend class or examination, or prevents or attempts to prevent any student from going to research farm, laboratory or library;
6. If he/she teases any student, or tortures physically or mentally, scares, encourages or compels to drink alcohol or any narcotics, or compels or motivates to get indulged in unsocial activities;
7. If he/she presents any false message, or delivers any speech or statement against the interest of the University or intends to create indiscipline or intends to defame;
8. If he/she destroys, harms, de-shapes or deform any asset of the University; either alone or in-group participates without the permission of the bona fide authority in affixing poster or banner, or writing on wall or on any establishment of the University, or provokes or compels others to such acts;
9. If he/she is suspected to be of loose-character; and
10. If he/she gets indulged in activities subversive to the existing state law.

13.2. SUPERVISORY AUTHORITY ON STUDENT CONDUCT

The Proctor and the Assistant Proctors appointed by the University authority from amongst the teachers on a two-year term are the responsible officers to look after the student conduct in the University campus outside the Hall/Dormitory premises. However, the Proctor can seek cooperation from any teacher, officer or staff for maintaining law and order situation in the

campus. The Student Disciplinary Committee is the supreme authority to take any final decision regarding the student conduct in the campus.

13.3. PUNITIVE PROCEDURES

The student faces punitive measures ranging from warning letter, undertaking, fine, forfeit of caution money, termination of scholarship or stipend, confiscation of compensation, temporary or permanent expulsion from the dormitory or from the University; or cancellation of certificate. However, the University authority, depending upon the degree of offence, shall assign a student such punitive measure (s) as judged appropriate for his/her misconducts. The Proctor can fine a student a maximum of Tk. 1000.00 (Tk. one thousand) for misconduct. If the proctor is not satisfied with such penalty, he/she can recommend to the Vice Chancellor for expelling this student from the University for a maximum period of 6 months (two terms). If the VC finds it necessary to expel this student for more than six months he forwards it in written for action to the Students Disciplinary Committee.

13.4. STUDENT'S GRIEVANCE/ APPEAL PROCEDURE

The student has an opportunity to resolve any complaints he/she may have alleging that any other rules or policies of the University were inappropriately applied and resulted in an injury to him/her. He/she can lodge an appeal to the appropriate authority through the Authority sanctioning punitive measures. However, such appeal must be submitted within 30 (Thirty) working days after imposing of punishment. The procedure is not applicable to certain kinds of complaints for which other appropriate appeal procedures exist, such as a grade appeal based on the application of nonacademic criteria.

14. STUDENT LIFE ON CAMPUS

The University authority appreciates that the accent of student life and activities on the campus is to provide an invigorating and creative environment, which promotes

independent thinking and introspection and leads the young students to become more aware of the consequence of their own actions. This allows them to weave a pattern of life, which equips them to stand up to the many pressures of community living, to train them in the making of inferences in everyday situations, to help them derive more insight into their personal relationships and to arouse in them a sensibility of aesthetic experience. With this realization, development initiatives have been undertaken, and are in progress.

14.1. STUDENT ID CARDS

Every student must have a student ID card issued by the University. Student ID card is his/her official identification as a student at BSMRAU. The University issues ID card to each student. For student ID card, the student will have to submit 2 copies passport size photographs at the time of admission.

14.2. HALLS OF RESIDENCE

There is one BS Students Hall exclusively for undergraduate male students, and a Female Student Hall of which one Wing is exclusively earmarked for undergraduate female students. The Halls/Dormitories are administered in accordance with the $\text{O}^{\text{W}}\text{i}^{\text{g}}\text{U}^{\text{i}}\text{x}/\text{n}^{\text{j}}\text{e}^{\text{e}}\text{v}^{\text{c}}\text{b}^{\text{v}}\text{i}\text{w}^{\text{b}}\text{q}^{\text{g}}\text{v}^{\text{e}}\text{j}^{\text{x}}\text{w}^{\text{e}}\text{l}^{\text{q}}\text{K}\text{A}^{\text{a}}\text{v}^{\text{t}}\text{k}^{\text{O}}$ (Dormitory/Hall Management rules and regulations Babosthaponav Neomaboli Bishoyak Odhyadesh).

The students of the University must be affiliated with the Hall/Dormitory. All undergraduate students are entitled to have accommodations in the Hall/Dormitory provided sufficient seats are available.

14.2.1. Hall Administration

Each hall is administered by a Provost, who is assisted by Assistant Provosts and House tutors. They are appointed from amongst the teachers on a two-year term.

14.2.2. Resident Students

The students who reside in the Hall/Dormitory are called resident students. The resident students must reside in the Hall/Dormitory for at least 80% of the working days of the term. This is essential for getting seat allocation in the next term.

14.2.3. Non-Resident Students

The students who with the permission of the authority stay outside of the Hall/Dormitory are called non-resident students. The non-resident students must be affiliated with any of the Hall/Dormitory. They have to pay all prescribed fees other than seat rents.

14.2.4. Seat Allocation Procedure

The newly admitted students shall apply in prescribed Form provided the seat rents and caution money have been paid along with other fees at the time of admission. The seats are allotted on merit basis based on availability. The decision of the Hall/Dormitory authority regarding seat allotment shall be the final. Each room is allotted to a maximum of 4 students depending on the size of the room. However, to meet the acute need, there may be exception.

In case of continuing student, the seat allocations are renewed in each term, i.e., the seats are cancelled at the completion of each term. Seat allotment is given only to the enrolled student. Studentship is a must for seat allocation in the Hall/Dormitory. The seats are renewed to a student provided the student maintains his/her studentship. The resident students must reside in the Hall/Dormitory for at least 80% of the working days of the term. This is essential for getting seat allocation in the next term.

14.2.5 Facilities in Hall

Each Hall/Dormitory is planned to be self-contained with amenities. At present each Hall/Dormitory is provided with a common room, an indoor games room, a lounge, a dining hall with the mess, and a TV in common room. The Hall administration provides games and sports items, newspapers, magazine, television, utensils for mess etc.

14.2.6. Cleaning of Hall/Dormitory

To keep the Hall/Dormitory clean is every resident's responsibility. The resident student on his/her own responsibility keeps the room clean. However, as a general responsibility, the Hall/Dormitory authority organizes cleaning of the outside of the room deploying cleaners.

14.2.7. Mess Management

Each Hall/Dormitory has its own mess. The mess of the Hall/Dormitory is managed by the students under the supervision and guidance of the Hall/Dormitory administration. The Mess Boys, Cook, and all other necessary facilities for the mess are provided by the Hall administration.

14.2.8 Rules for Visitors

1. Any guest or visitor can enter into the Hall/Dormitory entering their names, address and other necessary information into the Guest Register kept at the Entry gate of the Dormitory/Hall. The guest/visitor must sign in the register while leaving the Hall/Dormitory.
2. Entrance of female guest into Male student Hall/Dormitory, and that of male guest into Female student Hall/Dormitory are completely prohibited without the written permission of the Provost. This prohibition is applicable for the BSMRAU students also.

14.2.9. Prohibitory Rules for Resident Students of Hall/Dormitory

General

The resident students must abide by the rules and regulations of the Hall/Dormitory Management. The students must follow the restrictions/prohibitions imposed upon them by the Ordinance on the Dormitory/Hall Management Procedures. Such restrictions/prohibitions are as follows:

1. No resident student can stay out of the Hall between 9.00 PM to 5.00 AM during October - March and between 10.00 PM to 5.00 AM during rest of the year without the prior permission of the Provost. However, under special circumstances, permission may be obtained from the Provost.
2. No resident student can stay in the Hall/Dormitory during holidays without prior permission of the Provost.

3. No resident student can leave the Hall/Dormitory in day (s) other than holidays without prior permission of the Provost
4. Changing of any type in structure or paint of room of the Hall, writing name or anything with permanent ink or paint on doors or walls of the room, are completely prohibited. Such prohibitions are applicable to any part or furniture of the Hall/Dormitory.
5. No additional furniture other than those allocated by the Provost is allowed in the room.
6. No meeting, gathering or assembly can be organized inside the Hall/Dormitory or in any premise adjacent to it without the prior permission of the Provost.
7. No Forum or Association or any such organization can be formed in the Hall/Dormitory without the prior permission of the Provost, no student can organize any meeting, discussion on any special day, or party in the Hall/Dormitory.
8. No student can keep any pet animals or bird inside the Hall/Dormitory or in any place adjacent to the hall/Dormitory.
9. Resident students cannot deploy any body else for their own work inside the Hall/Dormitory.
10. No student can keep his/her own bike or motorcycle inside the Hall/Dormitory without the permission of the Hall/Dormitory authority. However, they can keep them in the fixed place in their own responsibility with the permission of the authority.
11. Playing CD player, MP3, DVD or Loud Speaker or any such musical instrument loudly, shouting, singing loudly, or taunting with objectionable words, ridiculing, etc., are prohibited. Ragging with new students inside/outside of the hall/Dormitory is punishable offence.
12. Entrance of hawkers, milkmen, or such people into the Hall/Dormitory is prohibited.
13. Entrance of female guest into Male student Hall/Dormitory, and that of male guest into Female student Hall/Dormitory are completely prohibited without the written permission of the Provost. This prohibition is applicable for the BSMRAU students also.
14. No play or sport items or newspaper/magazine of the Hall/Dormitory can be taken to the room.
15. Damaging or cutting of trees/vegetation, tearing/picking flower or fruits or intentionally breaking anything is prohibited.
16. Intentional breaking or taking into room for use any dining materials such as utensils (plate, glass etc..) is prohibited. These prohibitions are applicable to other usable items or furniture of the hall/Dormitory too.
17. Environment polluting materials such as wastes materials, waste papers, etc., cannot be thrown in place other than earmarked for such purpose inside the Hall/Dormitory.
18. No student can keep any guest overnight in his/her room without the prior permission of the Provost.
19. No student can change his/her room without the permission of the provost.
20. Keeping any type of sticks, knives, firearms and weapons inside the room is completely prohibited.
21. Keeping, drinking or using of any type of narcotics or alcohols is prohibited.
22. Threatening, physical assault, preventing from work/duty, or behaving impolitely or indecently with any staff of the Hall/Dormitory shall be considered as anti-disciplinary act.
23. Use of non-permitted electrical equipment such as electrical oven, electrical calendar, or unwanted intervention or interference in electrical supply system shall be considered as the anti-disciplinary act.
24. Any intervention or action by student alone or in-group to resolve any crisis/problem or to increase/improve any facility of the Hall/Dormitory shall be considered as disturbing Hall/Dormitory administration, and shall be treated as breach of discipline.

25. Affixing of photos of any political leader or objectionable or indecent scenery or displaying of pornography or blue picture anywhere inside the Hall/Dormitory is prohibited.
26. Any such restrictions/prohibitions that may create non-conducive environment in the Hall/Dormitory but not included in above shall be imposed as per the recommendation of the University authority from time to time.

14.2.10. Special Rules for Female Student Hall/Dormitory

1. All resident female students must be present in the Hall/Dormitory between 7.00 PM to 6.00 AM during October to March and between 8.00 PM to 6.00 AM during rest of the year.
2. No resident female student can stay in any other house without the permission of parents or local guardians.
3. The entrance of any outsider into the Hall/Dormitory without the permission of the Hall/Dormitory authority is completely prohibited. However, under special circumstances, female guest of resident female student can be allowed to the concerned female resident student's room provided the guest must be identified, and the name and address of the student and the guest's name and address must be written in the register kept at the gate. The guest like own mother, sister or close female relative of the female resident student can stay one/two nights in the Hall/Dormitory with the permission of the Hall/Dormitory authority.
4. Under no circumstances, any student of any other institution or any other female guest identified as relative can stay in the female student Hall/Dormitory.

14.2.11 Punitive Measures

The violation of any of the prohibitions/restrictions enlisted above shall be considered as the anti-disciplinary offence, and in such case, the Provost can expel the student temporarily or permanently from the Hall/Dormitory. The Hall Caution money of the penalized student

shall be forfeited. Besides, if necessary, the Provost shall recommend to the higher authority for taking action against the penalized student as per the University rules.

15. SERVICES AND FACILITIES

15.1 Library Services

The library is an important organ in support and development of high quality teaching, research and outreach programs. The University library building has a comprehensive and current collection of local and foreign journals relating to the agricultural and social sciences. The library possesses more than twenty thousand books and is under expansion through a regular acquisition program. In addition to book and journal collection, the library provides an interlibrary loan service and a computerized database of Bangladesh research titles and abstract. The library is opened throughout the year, except on government holidays. It is accessible to students, teachers, officers and other personnel associated with the University. E-journal and internet facilities are available. An audiovisual room with modern equipment is attached to the library building and is available as a training classroom and for holding conferences, seminars and workshops. Some group study rooms are also available. The library is air-conditioned with adequate sitting and reading facilities. The library is managed in accordance with the *ÖjvB†e'ix e"e"vcbv Aa"v†'k 1989Ö(Library Babosthapona Odhyadesh 1998)*.

15.1.1 Library Management

The overall management of the Library lies with the Library Committee. However, the library is headed by the Head, Library appointed for a two-year term from amongst the Professors of the University. He is assisted by a permanently appointed Librarian, Assistant Librarian and other staffs. The library is run as per the Library Management Ordinance approved by the Syndicate.

15.1.2. Library Timing

The library is kept open from 8.00 a.m. to 8.00 p.m. in Winter (November to February) and from 8.00 a.m. to 9.00 p.m. in Summer (March to October) on all days except Friday. However, any change in library timing shall be communicated immediately.

15.1.3. Entry into library

The students for entering into the library shall leave all their personal book, bag, sticks, umbrella, briefcase, newspaper, pullover, etc., to the Attendant at the entry gate of the library. However, necessary notebooks and other materials can be taken into the library provided those must be subject to search by the Attendants at the gate before leaving. The reserved books cannot be shifted without the permission of the concerned staff. All the materials left with the Attendant must be taken back before 15 minutes of closing time of the library. The library staff may physically inspect anyone, if necessary, while inside or leaving the library.

15.2. Library Card and Fees

All the students get the library Card immediately after admission. The student shall have to submit two copies of stamp size photographs for getting the library card. The library card is the library entry pass for the students.

15.2.1. Borrowing Procedure

Undergraduate students having library card can borrow at a time a maximum of three books. Journal cannot be issued to any student. Encyclopedia, dictionary and other reference materials can be borrowed with the prior permission. The students are not allowed to take out any reserved book. Thesis and dissertation can be issued only with the permission of the Head, Library. The students must return the book as per schedule as well as whenever they are asked to return, if necessary. For everyday delay in returning book a fine per day per book shall be charged. The students must return the books issued to them immediately after Final Examination of the term is over. If they fail to return the books within 7 (seven)

days, they shall be charged fine per day from 8th day onward.

No book can be issued to a student unless he/she returns the issued books, and in such case his/her library card may be suspended. The VC can cancel on the recommendation of the Head, Library the library card of any student, who does not return book regularly as per rules.

15.3. Restrictions

No one is allowed to smoke, fire match or shout in the library. All students like all others have to follow the rules and regulations of the library

16. TRANSPORT SERVICES

The transport service of the University is organized and managed in accordance with the Öhvbevn b xwZgvjv 2007Ó (Janbahon Nitimala 2007). The University provides the undergraduate student transport facility mostly for campus life. There is a Shuttle Service operating as per a fixed schedule from the University Campus to Joydebpur and back.

Moreover, an exclusive service (Saloon Service) is available for the student in the evening to enable them shopping at Joydebpur market. Another bus service is available to the student on Friday. This bus leaves the campus at 9.00 a.m. and leaves Dhaka (BARC) at 4.00 p.m. The students can avail the Ambulance service on medical ground, for which the Provost/Assistant Provost shall give requisition.

The students are to pay Tk. 100.00 as Transport Development Fee once at the time of admission, and Tk 60.00 per term (subject to change by the authority) at the time of enrolment for availing the Shuttle service. Saloon service and Friday service during the ensuing term. They shall have to pay bus rent as usual for any other service. If a transport or Ambulance is needed for the student (s), the Provost/Assistant Provost shall submit the requisition on the students' behalf to the Transport Coordinator.

17. FINANCIAL ASSISTANCE

All newly admitted undergraduate students get general stipend @ Tk. 200.00-300.00 per month on basis of GPA. The continuing student can also get merit scholarship from 2nd term on-ward. The merit scholarship is given to the student on competitive basis, based on academic performance in the previous term. For this, the students have to submit their application in prescribed Form. A number of undergraduate students covering all batches are given merit scholarship. The rest of the enrolled students, who maintain the minimum GPA 2.5 get general stipend. For the General stipend also the students shall have to submit application in prescribed Form to the Dean, Faculty of Agriculture.

18. STUDENTS' WELFARE SERVICE

The Students' Welfare Service is headed by a Director (Students' Welfare) appointed by the University on a two-year term from amongst the Professors. The Students' Welfare Service aims at assisting students in matters other than academics. The service mostly aims at assisting students in sorting out their difficulties and dilemmas in an environment where they can talk freely and in confidence about any matter which is troubling them. Students seek counseling for a variety of reasons, such as difficulties in adjusting to campus life, problems in relationship, being shy, feeling lonely, anxious, depressed, confused, unmotivated, inferiority, having difficulties with coping academic pressures and competition, worries about the future, low self-confidence, problems related to their facilities etc. The Director (Students Welfare) keeps constant touch with the students and monitors their problems. He/she assists the students to resolve any problem (s) in their campus life. He/she provides and/or organizes all facilities related to students programs on any special occasions. He/she is the only officially assigned authority in the University to look after overall welfare of the students.

19. CO-CURRICULAR ACTIVITIES

The University campus is located in an isolated area, long away from Dhaka City and far from Gazipur district head quarter. Thus there is limited opportunity of students for co-curricular pursuits outside the University. However, there is a provision of socio-cultural and other facilities like physical education, cultural club, debating club, indoor and outdoor sports in the University.

20. CAFETERIA

There is a central cafeteria and a private restaurant at the Essential Service Centre of the University.

21. MEDICAL FACILITIES

The University has a medical centre centrally situated in the campus. The medical centre is headed by a Senior Medical Officer assisted by one Male Medical Officer, one Female Medical Officer, Senior Compounder, one Dresser and one Technician. It provides facilities for primary health care and minor treatment with supply of simple medicines. The Medical Centre remains open from 9.00 a.m. till 5.00 p.m. The students at their ailment visit the doctors at the centre. In case of emergency, the doctors also visit the ailing student (s) at the Hall/Dormitory. It has a Pathology Lab. providing facilities for blood, urine and stool examination. The Medical Centre has an Ambulance for 24 hours service. For major treatments or complicated problems, the students are referred to the District Hospital at Joydebpur or to any Government Hospital in Dhaka. If the students prefer to have treatments at private clinic/hospital, they are allowed to do so. In all these cases, the Medical Centre provides them Ambulance service at University's cost.

22. ESSENTIAL SERVICE CENTRE

The University has established an essential service centre for enabling all the residents including the students of the University to buy their essential items within the campus. The essential service centre has all utility shops including bookshops, stationery shops and confectionary shops etc. which run privately.

23. SOLUTION OF UNSPECIFIED PROBLEMS

Anything not covered in this catalogue will be referred to and decided by the Academic Council.

24. ACADEMIC CALENDAR

At beginning of each academic year, detailed calendar of all academic activities is provided to the student.

25. COURSE CURRICULA AND FACILITIES OF DIFFERENT DEPARTMENT.

DEPARTMENT OF AGRICULTURAL ECONOMICS

The Department offers undergraduate (BS) courses as well as confers graduate programs leading to M.S. and Ph. D degree in Agricultural Economics. Research facilities are available for field studies in the BSMRAU social laboratory. Major areas of emphasis are economics of crop production, socioeconomic and environmental impact assessment of technology adoption, agribusiness, marketing, policy analysis and analysis of farm household economy.

Course Title : Agricultural Economics
Course Code : AEC 135
Course Credit : 03+0

Some basic concepts of economics, theory of demand and supply, elasticity of demand and supply, utility analysis, indifference curve analysis, markets and market structure, theory of production, definition and functions of central bank, commercial bank and specialized banks, role of agriculture in economic development.

Course Title : Agricultural Marketing and Finance.

Course Code : AEC 365
Course Credit: 03+0

Agricultural marketing- definition and scope, agricultural marketing and economic

development, marketing functions, marketing agencies, institutions and channels, costs, margins and price spread, agriculture and emergence of agribusiness, Problems agricultural marketing in Bangladesh, Importance of agricultural finance, structure of rural financial market, sources of capital and their role, micro-credit and poverty, farm investment analysis, risk in farming, inflation and public finance.

FACULTIES

Dr. M. Kamruzzaman

Professor & Head

Mr. Mohammad Ismail Khan

Associate Professor (Study leave)

Mr. Kazi Tamim Rahman

Assistant Professor

Dr. Asif Reza Anik

Assistant Professor

Mr. Md. Abdus Salam

Lecturer

Ms. Jaba Rani Sarker

Lecturer

DEPARTMENT OF AGRICULTURAL EXTENSION AND RURAL DEVELOPMENT

The Department offers both Undergraduate (BS) and Graduate (MS & Ph.D) programs. Research facilities are available for field studies in extension and rural education using the farmers' situation as a social laboratory. Major research thrusts are identification of constraints to agro-rural development; development of alternative extension methods, strategies and approaches; and extension teaching methods & techniques; adoption and diffusion of new agricultural innovations and their socio-cultural barriers and development of feedback mechanism on farmers' reactions on new technologies.

**Course Title : Fundamentals of
Agricultural Extension
and Rural Development**

Course Code : AER 165

Course Credit : 03+1.5

Theory: (Credits-3.0)

1. **Agricultural Extension:** Concept and evolution of agricultural extension, major thrust of extension activities in different decades, scope and objectives of agricultural extension; principles and philosophies of agricultural extension; history and development of agricultural extension work in Bangladesh and other countries; integrated functions of agricultural education, research and extension services.
2. **Education and Learning:** Definition and meaning of education; objectives of education; types of education; formal, non-formal, informal education, adult education; definition of learning; types of learning, teaching-learning process; principles, laws and theories of learning; criteria for effective learning.
3. **Motivation:** Concept of motivation; motivation cycle; role of motivation in job performance; motivation of the village people and extension workers; theories of motivation- concept and meaning of need, types of need, Maslow's need theory and its implication in extension work.
4. **Rural Development:** Concept of rural development; scope of rural development; history of rural development in Bangladesh; rural problems, role of BARD, RDA and BRDB in rural development; NGO interventions for rural

development; Rural poverty; poverty trap: causes and solutions; role of GOs and NGOs in rural poverty mitigation; involvement of rural youth, women and landless farmers in rural development activities of Bangladesh. Rural development tourism, biases of outsiders for contacting rural people, sustainable and participatory rural development, sustainable livelihood and asset pentagon

Practical: (Credits-1.5)

1. Understanding basic facts of Bangladesh agriculture, population, education, administration, exports and import of agricultural products.
2. Introduction to different organizations related to agricultural development and their main objectives and activities-DAE, DLS, DOF, BADC, national and international NGOs with special emphasis on BRAC, TMSS and ACI and other related organizations.
3. Introduction to important development organizations & institutions with their main objectives and activities: BRDB, BARD and RDA.
4. Visit to GOs (BRDB/BARD/RDA) and NGOs (BRAC, ACI and other related organizations).
5. Lecture and its practice in the laboratory and in the farmers' situation.
6. Preparation and use of some teaching aids: poster, flashcards, OHP and multimedia.

**Course Title : Rural Sociology and
Educational Psychology**

Course Code : AER 265

Course Credit : 03+1.5

Theory: (Credits-3.0)

1. **Rural Sociology:** Definition, meaning, nature, scope, importance, limitations and elements of rural sociology; origin and development of rural sociology; society: characteristics of rural society; rural-urban differences; culture, norms, values and beliefs; rural sociology and other social sciences, anthropology: concept and types
2. **Social Institutions:** Family: concept and meaning, types, functions, importance, group: concept and meaning, types, characteristics, preconditions of group formation, comparison of different types of groups; religion; marriage: divorce and separation; social mobility, community and its characteristics; migration: causes & consequences
3. **Psychology:** Concept of psychology; education and educational psychology; methods of obtaining information in psychology; scope of psychology; educational psychology as applied to extension education; objectives and contribution of psychology; aims of educational psychology
4. **Biological Basis of Human Behavior:** Concept and meaning of socialization, socialization process; social stratification; personality-concept and meaning, characteristics of personality, elements of personality, factors affecting personality development; frustration-concept and meaning, causes of farmer's frustration, adjustment to frustration, social stratification

Practical (Credits-1.5)

1. Identification of social institutions
2. Introduction to the methods of data collection
3. PRA techniques: social/physical mapping, wealth ranking, trend analysis, seasonal diagram etc.
4. Conduction of social survey and presentation of its report
5. Visit to one ethnic group of minority community and preparation of report on their socio-economic status

Course Title : Management of Agricultural Extension Organizations

Course Code : AER 301

Course Credit : 03+1.5

Theory: (Credits-3.0)

1. **Extension Organization:** Concept and meaning of organization, basic elements of an organization, purposes of organization, principles of organization, DAE- its mission, role of DAE, organizational structure of DAE, new agricultural extension policy (NAEP), duties and responsibilities of different categories of personnel in DAE, problems of extension work in Bangladesh, different approaches and models of agricultural extension work.
2. **Management, Administration and Supervision:** Concept of management, objectives of management, management functions, management by objectives (MBO), management information system (MIS), concept of administration, elements of administration, characteristics of administration, principles for increasing efficiency in extension administration, concept and principles of supervision, coordination, decision making process.

3. **Extension Program Planning and Development:** Meaning and definition of program planning, importance and principles of program planning; procedure of extension program planning; characteristics of a good program; people's participation in extension program planning; reasons for failure of an extension program.
4. **Group Dynamics and Leadership:** Concept, meaning and definition of group dynamics; external and internal forces of group dynamics; types of leaderships with their salient features; importance of leadership in extension work; qualities of a good leader; task and relationship oriented leadership, selection, training and recognition of local leaders.
5. **Monitoring and Evaluation:** Meaning and definition of monitoring and evaluation; importance and objectives of program evaluation; types of evaluation; principles and procedures of extension program evaluation, `difference between monitoring and evaluation, impact evaluation.

Practical: (Credits-1.5)

1. Different organizations related to agricultural development in Bangladesh.
2. Preparation of plan of work and calendar of work.
3. Procedure for project development.
4. Preparation and practicing of a training program.
5. Planning of an agricultural extension program: identification of problem, analysis of stakeholder, analysis of objectives and alternatives and development of logical framework (log-frame) on some projects

6. Office management procedures: record keeping, noting/filing, methods of official correspondence.

Course Title : Communication and Technology Transfer

Course Code : AER 425

Course Credit : 03+1.5

Theory: (Credits-3)

1. **Extension Communication:** Concept of communication and its problems, scope, functions and importance of communication; models of communication; types of communication; elements of communication process; barriers and noise in communication, feedback of communication; communication pattern and networking
2. **Extension Teaching Methods;** Meaning of extension teaching methods; steps in teaching; planning of extension teaching; classification of extension teaching methods; factors to be considered in selecting extension teaching methods; advantages and limitations of different extension teaching methods; selection and combination of extension teaching methods for greater effectiveness
3. **Extension Teaching Aids;** Meaning of extension teaching aids; classification of extension teaching aids; audio-aids, visual-aids, audio-visual aids; benefits and choice of extension teaching aids; advantage and limitations of different extension aids; criteria for selection and evaluation of extension teaching aids
4. **Transfer of technologies:** Meaning and definition of technology; types of innovation, adoption and diffusion of agricultural technologies; adoption and diffusion process, innovation- decision process, types of innovation, attributes of an innovation; innovativeness and adopter categories; diffusion curve, barriers to adoption and diffusion of innovations; factors affecting the transfer of agricultural technologies in Bangladesh

Practical: (Credit-1.5)

1. Conduction of seminar, symposium, workshop and conference
2. Preparation of printed materials: folder, leaflet, bulletin, handout etc.
3. Preparation of radio talks and its practice
4. Data collection instruments; preparation of interview schedule and procedure of interviewing
5. Case study and preparation of its report
6. Preparation and presentation of survey report
7. Identification of important technologies in the field of agriculture
8. Use of ICT in agricultural related activities
9. Extension field trip and preparation of its report.

The Laboratory is provided with the following equipments:

1. Multimedia projector
2. DVD player
3. Television
4. Digital video camera

FACULTIES

Dr. Md. Enamul Haque
Professor & Head

Dr. Md. Safiul Islam Afrad
Associate Professor

Mr. Md. Mofakharul Islam Shah
Assistant Professor (Study leave)

Mr. Shaikh Shamim Hasan
Assistant Professor

Ms. Farhana Yeasmin
Assistant Professor

Mr. Mohammed Rokonuzzaman
Assistant Professor

Mr. Muhammad Ziaul Haque
Lecturer

DEPARTMENT OF AGROFORESTRY AND ENVIRONMENT

The Department of Agroforestry and Environment has been functioning since 1996 to produce quality graduates in the field of Agroforestry and Environment and offering BS, MS and Ph.D Programs. It has modern research facilities. The department gives emphasis on impact study, resource use and livelihood for students' research work. Besides its academic research, the department has good reputation of conducting contract research programmes funded by other organizations, particularly international organizations. Since its inception, the Department had successfully completed several research projects funded by BARC, World Bank, UNESCO, FAO, EC and USDA. The Department has wide scope and facilities for undertaking research. The Department has well managed experimental field of 2.5 ha, with well equipped laboratory facilities. The Department is acting as liaison office of the International Centre for Research in Agroforestry (ICRAF) in Bangladesh since 2003. The Department is actively involved in the Man and Biosphere Research in Bangladesh, and Asia-Pacific Network for Global Change Research (APN) as Scientific Planning Group Member since 2005. The Department has been providing technical services to the National and International organizations working in the country in relevant fields (Agroforestry, Environment, rural development, food security, land use etc) through attending the program planning, mid term evaluation and program ending meetings/workshops.

Course Title : Introduction to Agroforestry and Environmental Science

Course Code : AFE 301

Course Credit : 3+1.5

Concepts and definition of Agroforestry, characteristics and components of Agroforestry. Status of forest in major forest ecosystems of Bangladesh. Overview of world forest. Need and perspective areas of

Agroforestry in Bangladesh. Benefits of Agroforestry. Social forestry and Community forestry. Hypothesis in Agroforestry. Classification of Agroforestry, Multipurpose tree species of Agroforestry. Brief description of major Agroforestry systems in Bangladesh.

Concepts and major components of Environment. Description of different layers of atmosphere. Brief description of hydrosphere, lithosphere, and biosphere. Environmental pollution: Air pollution, water pollution, noise pollution. Arsenic contamination of ground in Bangladesh. Green house gases and global warming.

Course Title : Silviculture
Course Code : AFE 350
Course Credit : 3+1.5

Concepts and scope of Silvicultural practices, some related terminology. Sources of seed, characteristic of mother trees and their management. Seed collection - area, time, method, time of maturity, and equipment for seed collection. Seed extraction and processing. Nursery: concept, type, site selection, infrastructure, preparation of seed bed, cultural and management practices. Types of nursery stocks, tending and protection of planting stocks. Planting survey, planting plan, site preparation, planting geometry, spacing, transporting of planting materials and method of planting. Tending operation: watering, mulching, weed control, vacancy filling, fertilizer application, pruning, thinning. Estimation of the volume of log. Silvicultural systems used in homestead and forest plantation.

FACULTIES

Dr. Md. Giashuddin Miah
Professor

Dr. Md. Main Uddin Miah
Associate Professor

Mr. Tofayel Ahmed
Associate Professor & Head

Dr. Md. Abiar Rahman
Associate Professor

Dr. Satta Ranjan Shaha
Associate Professor

Ms. Noor Shaila Sarmin
Assistant Professor

Dr. Shohana Pervin
Assistant Professor

Mr. Minhaz Ahmed
Lecturer

DEPARTMENT OF AGRONOMY

The department offers courses for BS, MS & Ph.D Programs. Research facilities are available for field and laboratory works in most areas of stand establishment, crop physiology, Eco physiology, crop management, weed science and seed science aspects of crop production.

Course Title : Fundamentals of Agronomy
Course Code : AGR 101
Course Credit : 3+1.5

Theory (3.0 Cr. hr.): Concept, importance, opportunities, constraints and branches of agriculture; concept and basic principles of agronomy; concept of crops and classification of field crops; principles of crop growth and development; cropping seasons of Bangladesh; definition, classification and characteristics of quality seeds; weather and climate, weather elements and crop growth; definition, importance and classification of tillage; concept of tilth and plough pan formation and their impact on crop production; sowing and transplanting; seedling establishment and plant population density; intercultural operations: weeding, thinning, earthingup, irrigation and drainage; basic concept of crop nutrition, functions of nutrient elements, fertilizer and manure; crop geography of Bangladesh.

Practical (1.5 Cr. hr.):

Identification and classification of field crops; identification of crop growth stages; identification and utilization of tillage, intertillage and other agricultural implements; observation of agro-meteorological instruments; observation of plough pan formation; seed bed preparation; seed identification; practicing intercultural operation; identification of manures and fertilizers, calculation of fertilizer dose.

Course Title : Fundamentals of Cereal Crop Production

Course Code : AGR 175

Course Credit : 3+1.5

Theory (3.0 Cr. hr):

Scope, limitation and strategies of cereal crop production; origin of rice; distinguished features between *indica*, *japonica* and *javanica* rice; growth stages of rice plant; rice ecology, classification of rice culture, ratoon rice; upland rice culture; transplanted and deep water rice culture; characteristics of HYVs developed in Bangladesh; origin and classification of wheat; growth stages of wheat; distinguished characteristics between new and old wheat; climate, and cultural practices for wheat production; quality factors in wheat; origin and classification of maize; growth stages of maize; climate and cultural practices for maize production; origin and classification of barley, plant morphology and growth stages of barley, cultural practices for barley production; origin, classification and growth stages of minor cereals; cultural practices for minor cereals.

Practical (1.5 Cr. hr.):

Identification of growth stages of different cereals; cereal production under different tillage conditions; cereal production under different levels of fertilizers; cereal production under different levels of moistures.

Course Title : Weed Science

Course Code : AGR 205

Course Credit : 3+1.5

Theory (3.0 Cr hr):

Introduction: concept, definition, characteristics and harmful and beneficial effects of weed; weed biology & ecology: classification of weeds; propagation, dispersal and distribution of weed; persistence of weeds; major weeds of Bangladesh; morphology of major weeds; crop-weed interference: critical period of crop-weed competition; degree of weed infestation; competitive ability of crops against weeds; allelopathy, allelopathic effects of weeds on crop and vice-versa; weed management: components of weed management, weed management in major crops; methods of weed control; chemical weed control; classification of herbicides; herbicide formulation; mode of action of herbicide; herbicide selectivity; behavior of herbicide in plant and soil; rice herbicides in Bangladesh; herbicidal weed control in major crops; integrated weed management.

Practical (1.5 Cr. hr.):

Identification of major weeds from upland and lowland habitat; study on the life cycle and morphology of major rice weeds; identification, description and use of weeding implements; field exercise on mechanical weed control; identification, description and use of chemical weed control equipment; herbicide dose calculation and herbicide sprayer calibration; study on the effect of weed infestation on the growth and development of rice plants.

Course Title : Agro-climatology

Course Code : AGR 255

Course Credit : 3+1.5

Theory (3.0 Cr. hr.):

Climate and weather terms; elements of climate and weather, meteorology and climatology; agro-meteorology and agro-climatology and Earth's climatic history; climate, agricultural production and food security; biosphere, characteristics of atmospheric layers; atmospheric composition; atmospheric energy, warming the earth and the atmosphere, heat

transferring in the earth-atmosphere system; radiation and temperature; Wien's law, Stefan-Boltzmann law; absorption, emission and equilibrium; atmospheric moisture; air pressure and humidity; water cycle; ozone layer; atmospheric pressure; causes of air movement; the general circulation of the atmosphere and the ocean; earth rotation; causes of earth season; cloud: types characteristics and formation; classification of world climatic; agro-climate of Bangladesh: delineation of climatic regions; agro-ecological zone (AEZ); global climate change; application of agro-climatology knowledge on crop production.

Practical (1.5 Cr. Hr.):

Air temperature and its measurement; measurement of relative humidity; measuring precipitation by rain gauge; estimation of wind velocity and wind direction; measurement of photo-synthetically active radiation in the crop canopy; study of agro-climatic zones of Bangladesh ; observation of crop plants grown under different light and moisture conditions.

Course Title : Seed Science and Technology

Course Code : AGR 325

Course Credit : 3+1.5

Theory (3.0 Cr. hr.):

Introduction to seed: definition, role, use and classification; physiology of seed formation and development; seed growth, maturation; chemical composition of seed; seed and seedling morphology; seed dormancy, biological significance, types and breaking of seed dormancy; seed quality attributes: genetical purity; analytical purity; seed moisture content; seed germination; seed health; seed and field standard of seed quality. seed production: factors influencing quality seed production; agro-ecological requirements, crop and variety selection, crop alteration, isolation, land selection, land preparation, planting, fertilization, irrigation, weed control, roguing, plant protection and harvesting; hybrid seed production; seed processing: principles of seed processing;

drying, cleaning, grading, treating, packaging; seed storing: physiology of seed ageing, factors influencing storage life, types of storage; seed certification: quality control, legislation, seed marketing.

Practical (1.5 Cr. hr.):

Seed identification and preparation of seed album; structures of monocotyledonous and dicotyledonous seeds; seed sampling for laboratory tests; purity analysis of seed; determination of seed moisture; seed germination test; seed vigor test; calculation of seed rate of different field crops; practicing seed treatment; field inspection of seed crops.

Course Title : Production of Pulses, Oil-seeds and Industrial Crops

Course Code : AGR 375

Course Credit : 3+1.5

Theory (3.0 Cr. hr.):

Origin, distribution, classification, morpho-physiology, climate and soil requirements, characteristics of species, crop varieties, production technology, post-harvest operations and basis of yield improvement of pulse, oilseed and industrial crops i.e. grasspea, lentil, mungbean, blackgram, chickpea, cowpea, pigeonpea, rapeseeds, mustards, sesame, groundnut, soybean, sunflower, safflower, linseed, jute, kenaf, cotton and sugarcane.

Practical (1.5 Cr. hr.): Conducting simple experiments to study the effect of agronomic practices on crop production and preparation of a project paper; study on the distinguishing characteristics of different species and crop varieties; identification of different crops and varieties; evaluation of the effect of planting density, sowing method, water regimes, fertilizer application and intercultural operations on crop growth and productivity, practicing different planting methods of sugarcane.

Course Title : Irrigation and Farm Management

Course Code : AGR 475

Course Credit : 3+1.5

Theory (3.0 Cr. hr.):

Irrigation: definition and background; importance of irrigation; soil physical properties in relation to irrigation practices; irrigation water requirement; time of application of irrigation; conveyance, distribution and field application systems; methods of irrigation, their advantages and disadvantages; measurement of irrigation water loss; present status of irrigation in Bangladesh; common problems in irrigated agriculture and their remedies; drainage of agricultural lands.

Farm management: Concept and definition; principles of farm management; consideration for establishment of a farm; farm types, structure and farm layout; crop planning, cropping systems, crop rotation, farming systems; farm budgeting and farm planning: partial and enterprise budgets, farm budgeting; resource inventory and management of resources; farm efficiency measures and enterprise diversification; financial management: record keeping, balance sheet and cash book; risk management; personnel management.

Practical (1.5 Cr. hr.)

Identification and use of irrigation machinery; determination of irrigation water requirement; Farm layout preparation, layout of experimental plot, farm records and their maintenance, preparation of cropping scheme, crop rotation schedules, crop calendar; crop cutting experiment; economic analysis of an enterprise, visit to an agricultural farm and preparation and presentation of report.

Lab. Facilities

01. Balance
02. Augur
03. Moisture Meter
04. Oven
05. All types of field equipments
06. PH Meter
07. EC Meter
08. DO Meter
09. Germinator
10. Sunflexptometer

FACULTIES

Dr. M. Abdul Karim
Professor & Head

Dr. Qazi Abdul Khaliq
Professor

Dr. M. Moynul Haque
Professor

Mr. Md. Nasimul Bari
Professor

Dr. Md. Rafiqul Islam
Associate Professor

Dr. Md. Abdul Mannan
Associate Professor

Mr. Md. Moshiul Islam
Assistant Professor (Study leave)

Mr. K.M. Shamsul Haque
Assistant Professor (Study leave)

Mr. Md. Arifur Rahman Khan
Lecturer

Ms. Nurunnahar Akter
Lecturer

**DEPARTMENT OF AGRO
PROCESSING**

The Department offers a graduate program leading to M. S. degree.

The studies in Agro-processing are designed to strengthen the knowledge of students of the relevant engineering, biological, sociological and economic aspects of food processing as well as preservation, storage and marketing of those products. Agro-processing graduate will be equipped with theory & practical knowledge in grasping field problems associated with post production system.

Lab Facilities

The laboratories is equipped with:

01. Spectrophotometer
02. Drying oven
03. Water distillation plant
04. pH meter
05. Electrical balance
06. Muffle furnace
07. Computer
08. Overhead stirrer

FACULTIES

Dr. Safiul Islam Afrad

Associate Professor & Head

Mr. Md. Amdadul Haque

Assistant Professor (Study leave)

Dr. Md. Ahiduzzaman

Assistant Professor

DEPARTMENT OF AGRICULTURAL ENGINEERING

The department of Agricultural Engineering being one of the 19 departments of the faculty of Agriculture of BSMRAU, started functioning since 2005 with a view to disseminating the basic knowledge of Agricultural Engineering among the BS (Agriculture) graduates of this University. It helps engenders knowledge in the field of Farm Power Machinery, Irrigation Water Management, Farm Small Structures and Farm Mechanization as a whole. The department accomplishes its intended function rendering knowledge to the BS (Agriculture) students through a course AEG-180 Farm Mechanics during winter term using two well equipped laboratories e.g. (1) Farm Machinery Laboratory and (2) Irrigation and Drainage Laboratory along with an (3) Engineering Workshop. The department also has a (4) Weather Station to collect meteorological data as well as to demonstrate the BS (Agriculture) students. Along with teaching the department is also involved in some basic and applied research on different aspects of irrigation and water management in the field of agriculture. The

department of Agricultural Engineering is now in a state to offer MS degree on 'Irrigation and Water Management' in near future.

Course Title : Farm Mechanics

Course Code : AGE 180

Course Credit : 3+1.5

Theory:(3.0 Cr. hr.)

Farm Mechanization: Definition, history, scope, importance and limitation of farm mechanization, Different approach of mechanization, Sustainability of agricultural mechanization;

Farm Power: Sources of Farm Power, Engine and its classification, Operating principles of two stroke and four stroke engines and their difference, Engine working systems- fuel, ignition, cooling, lubricating & transmission system, Engine trouble shooting, repair & maintenance;

Farm Implement and Machinery: Definition and classification of farm implements and machinery, Introduction to tillage implements, Pre and post harvest farm machinery, and Plant protection machinery, Selection of farm machinery;

Post Harvest Technology: Definition and importance of post harvest technology (drying and storage of food grains). Principles and methods of drying and storing of food grains, Moisture content of food grains, fruits & spices and its determination;

Engineering Materials: Definition and importance of construction materials, Constituents, classification and uses of Bricks, Sand, Cement, Timber, Steel and other construction materials;

Irrigation and Drainage: Importance and scope of irrigation, Irrigation development in Bangladesh. Methods of irrigation and water requirement of crops, Irrigation pumps and wells, their classification, uses, maintenance and trouble shooting, Drainage and its importance in agriculture in Bangladesh ;

Practical: (1.5 Cr. hr.)

- Identification and uses of common hand tools used in a machinery workshop,
- Identification and explanation of function of different parts of IC engines,
- Identification and description of different farm implements and pre & post harvest machinery,
- Measurement of disc angle and tilt angle of a standard disc plough and their adjustment in the field
- Identification and description of different functional components of a power tiller,
- Identification and description of different functional components of a tractor,
- Identification of functional components of a seed drill machine and its calibration,
- Field operation of power tiller and tractor with different farm implements and measurement of their field performances,
- Identification and uses of different irrigation water pumps/lift, water conveyance and control structure,
- Identification and uses of different irrigation water measuring structures/ equipment and measurement of channel water using current meter, V notch weir and cutthroat flume,
- Visit to farm machinery development workshops of BSRI, BRRI etc.

Lab Facilities of Agricultural Engineering:

The lab facilities in terms of equipments available in two of its laboratories along with an engineering workshop and a weather station are listed below:

(1) Farm Machinery Laboratory

| Sl. No. | Name of machinery /equipment | Quantity |
|---------|------------------------------|----------|
| 1 | Diesel Engine | 2 Set. |
| 2 | Drum seeder | 5 Set. |
| 3 | Power tiller with | 2 Set |
| 4 | Tractor (60 hp, 2WD) | 1 No. |
| 5 | Rotavator | 1 No. |
| 6 | Offset disc harrow | 1 No. |
| 7 | Water Pump | 2 Set. |
| 8 | Country Plough with yoke | 2 Set. |
| 9 | BARI Mould Board Plough | 2 Set |
| 10 | Hand corn sheller | 1 No. |
| 11 | Dry land weeder | 1 No. |
| 12 | Water Pump | 2 Set. |
| 13 | Allen key | 1 Set. |
| 14 | Screw driver | 1 Set |
| 15 | File, (Flat, round, half | 4 Nos. |
| 16 | Hacksaw Frame | 1 No. |
| 17 | Hand Saw (wood cutting) | 1 No. |
| 18 | Shouldering iron | 1 No. |
| 19 | Inside and outside | 1 Set. |
| 20 | Pipe wrench | 1 No. |
| 21 | Micrometer | 1 No. |
| 22 | Wire gauge | 1 No. |
| 23 | Filler gauge | 1 Set. |
| 24 | Center punch | 1 Set. |
| 25 | Number punch | 1 Set. |
| 26 | Ball peen hammer | 1 No. |
| 27 | Cross peen hammer | 1 No. |
| 28 | Claw hammer * | 1 No. |
| 29 | 9 PCS Normal grip screw | 1 Set. |
| 30 | Vernier callipers | 1 No. |
| 31 | Box socket wrench | 1 Set |
| 32 | Top loading balance, 15 | 1 Pc |
| 33 | Combination wrench | 1 Set |
| 34 | Adjustable wrench 10" & | 2 Nos. |
| 35 | Combination pliers 6" & | 2 Nos. |
| 36 | Nose pliers, 6" | 1 No. |

(2) Irrigation and Drainage laboratory

| Sl. No. | Name of machinery /equipment | Quantity |
|---------|---|----------|
| 1 | Digital soil moisture meter | 1 No. |
| 2 | Distillation plant | 1 No. |
| 3 | Automatic leaf area meter | 1 No. |
| 4 | Current flow meter | 2 No. |
| 5 | Cut throat flume | 1 No. |
| 6 | V Notch wear | 1 No. |
| 7 | Irrigation water test kits | 1 Set |
| 8 | 50 mm diameter sand auger with extension | 1 No. |
| 9 | Irrigation display board | 1 Set |
| 10 | Aquater digital soil moisture, Temperature and salinity meter | 1 No. |
| 11 | Tensiometer | 18 No. |
| 12 | Portable dissolved oxygen meter | 1 No. |
| 13 | Portable pH meter | 1 No. |
| 14 | Pocket pH meter | 1 No. |
| 15 | Forced convection oven | 1 No. |
| 16 | Precision balance | 1 No. |
| 17 | Digital magnetic stirrer with accessories | 1 No. |
| 18 | Drip irrigation set | 2 Set. |
| 19 | Double ring infiltrometer | 1 Set. |

(3) Engineering Workshop

| Sl. No. | Name of machinery /equipment | Quantity |
|---------|------------------------------|----------|
| 1 | Lathe machine | 2 No. |
| 2 | Column drill machine | 2 No. |
| 3 | Angle grinder | 1 No. |
| 4 | Air compressor | 1 No. |
| 5 | Hand electric drill machine | 1 No. |
| 6 | Electric hand saw | 1 No. |
| 7 | Electric floor saw | 1 no. |
| 8 | Anvil | 2 Nos. |
| 9 | Hand Hammer (1 kg & 0.5 | 2 Nos. |
| 10 | Cut off machine | 2 Nos. |
| 11 | Sheet cutting machine | 1 No. |
| 12 | ARC welding machine | 1 No. |
| 13 | Table vice | 1 No. |
| 14 | Pedestal grinding machine | 1 No. |

(2) Weather Station

| Sl. No. | Name of machinery /equipment | Quantity |
|---------|---|----------|
| 1 | Class-A Evaporation pan with automatic recorder | 1 Set. |
| 2 | Class-A Evaporation pan (manual recording sys.) | 1 Set. |
| 3 | Rain gauge with automatic recorder | 1 Set. |
| 4 | Rain gauge (manual recording sys.) | 1 Set. |
| 5 | Digital Barometer | 1 No. |
| 6 | Digital Pyrradiometer | 1 No. |
| 7 | Digital Anemometer | 1 No. |
| 8 | Thermograph | 1 No. |
| 9 | Hygrograph | 1 No. |
| 10 | Dry and wet bulb | 2 Nos. |
| 11 | Mercury thermometer | 5 Nos. |
| 12 | Groundwater level | 1 No. |

FACULTIES

Dr. S.M. Iqbal Hossain
Professor & Head

Mr. Md. Moinul Hossain Oliver
Assistant Professor (Study leave)

DEPARTMENT OF BIOCHEMISTRY

The department offers courses for undergraduate and Postgraduate programs.

Course Title : Biochemistry-1

Course Code : BCH 135

Course Credit : 3+1.5

Theory: (3.0 Cr. hr.)

Biochemistry and Biomolecules: Definition and Importance of Biochemistry and Biomolecules.

Carbohydrates: Definition, Occurrence, Functions, Classification, Chemical and Physical Properties, Chemistry of Monosaccharides and Disaccharides.

Composition and Linkages of Polysaccharides with Special Reference to Starch, Cellulose, Glycogen and Cell Wall Polysaccharides.

Protein: Definition, Occurrence, Functions, Classification, Different structures of Proteins, Chemical and Physical Properties, Reactions of Amino acids, Denaturation of Proteins, Peptide Bonds and Proteins, Hydrolysis of Proteins, Acid-Base properties of Amino acids, Isoelectric Point, Globular and Fibrous proteins.

Lipids: Definition, Occurrence, Functions, Classification, Chemical and Physical Properties, Fatty Acid Composition of Fats, Characterization of Fat, Oil and Waxes; Phospholipids with special reference to lecithin and cephalin, Glycolipids and Cholesterol.

Nucleic Acids: Definition, Occurrence, Roles of nucleic acids, Classification, Structural Features, Concept of Central dogma.

Enzymes: Definition, Functions, Classification, Concept of Active Centre, Coenzymes and Prosthetic Groups, Mode of Actions, Factors Affecting Enzymatic Reactions, Inhibition and Regulation of Enzymes. Principle of Enzyme Assay.

Hormones: Definition, Occurrence, Functions, Classification, Physiological and Biochemical Functions.

Micronutrients (Vitamins and Minerals): Classification, Occurrence, Biochemical Functions, Deficiency Symptoms, RDA.

Practical: (1.5 Cr. hr.)

1. Use of Analytical Balance
2. Preparation of standard solution and standardization of HCl.
3. Identification of organic compounds and colour test for biomolecules.
4. Use of a pH meter and determination of pH of a solution.

5. Estimation of glucose by Fehling's method
6. Preparation of buffer solution and demonstration of buffer action
7. Estimation of calcium content by the permanganate method
8. Estimation of copper content of the supplied solution using iodometry method.
9. Determination of phosphorous content of the supplied solution.
10. Estimation of Iron content of Mohr's salt by the dichromate method.

Course Title : Biochemistry-2

Course Code : BCH 265

Course Credit : 3+1.5

Theory: (3.0 Cr. hr.)

Digestion and Absorption of Foods in Animal Body: Digestion and Absorption of Carbohydrates; Digestion and Absorption of Protein; Digestion, Absorption and Secretion of Dietary Lipid.

Carbohydrate Metabolism: Basic Concepts of Metabolism (Definition of Metabolism, Catabolism, Anabolism, Regulation of Metabolism), Glucose Breakdown (Glycolysis), Fructose and Galactose Metabolism, Glycogen breakdown (Glycogenolysis), TCA (Citric Acid Cycle/Krebs Cycle), Electron Transport Chain (ETC), Gluconeogenesis, Pentose Phosphate Pathway (HMP), Biosynthesis of Sucrose and Starch

Protein Metabolism: Transamination, Oxidative Deamination, Decarboxylation, Urea Cycle, Metabolism of Ammonia, Toxicity of Ammonia, Metabolism of carbon skeletons of amino acids, Biosynthesis of non-essential amino acids, Metabolic defects in amino acid metabolism.

Lipid Metabolism: Mobilization of Stored Fats and Beta-Oxidation of Fatty Acids, Cholesterol, Bile Acids, Bile Salts, Plasma Lipoproteins, Lipid Peroxidation, Glyoxalate pathway, Biosynthesis of Fatty Acids.

Bioenergetics: Definition, Free Energy, Enthalpy, Entropy, ATP as a Universal Energy Carrier, Exergonic and Endergonic reactions, ADP-ATP cycle.

Nucleic Acids: Replication, Transcription and Translation (Protein synthesis).

Nutrition: Foods, Nutrients (Macronutrients and Micronutrients), Nutrients Requirements in Humans, RDA, PER, NPU, Biologic Value, Balanced Diets, Dietary Principles, Basal metabolic requirement (BMR), Energy Requirements in Humans, Macronutrients, Dietary fiber, Protein Caloric Malnutrition (Marasmus, Kwashiorkor), Obesity-Cancer and Diets.

Instrumental Methods for Analysis: Principle and Uses of pH Meter, Spectrophotometer, Atomic Absorption Spectrophotometer (AAS), Mass Spectrometry (MS), Chromatography (HPLC, TLC), Colorimetry, Fluorimetry.

Practical: (1.5 Cr. hr.)

1. Preparation of 0.1N Na_2CO_3 and determination of the strength of supplied HCL.
2. Estimation of acetic acid content of supplied vinegar.
3. Estimation of Ascorbic acid content of the supplied solution and Biological samples using Bessel's Titrimetric method.
4. Determination of saponification number of fat or oil.
5. Determination of iodine number of fat or oil.
6. Verification of Beer Lambert law and determination of $-max$
7. Determination of lactose content of milk using Benedicts quantitative solution.
8. Determination of cholesterol content in egg Yolk.
9. Determination of glucose content of commercial juice.
10. Estimation of fish protein by Kjeldahl method.

11. Separation and identification of different amino acids by TLC.
12. Separation of sugar mixtures by Thin Layer Chromatography (TLC).
13. Gram staining of Bacteria.
Estimation of Alpha $-$ amylase.

FACULTIES

Dr. Md. Khurshed Alam Bhuiyan
Professor & Head

Dr. Md. Shahjahan
Associate Visiting Professor

Mr. Mohammad Golam Mostafa
Assistant Professor (Study Leave)

Mr. Mohammad Bodruzzaman
Assistant Professor (Study Leave)

DEPARTMENT OF BIOTECHNOLOGY

The Department of Biotechnology was established in 2003 with a view to disseminating knowledge and train students at undergraduate and graduate levels at BSMRAU. The primary goal of this department is to deliver high class teaching and conduct both basic and applied research in the field of biotechnology.

**Course Title : Introductory
Biotechnology and
Genetic Engineering**

Course Code : BTL 410

Course Credit : 3+1.5

The department offers one core course, *BTL 410 Introductory Biotechnology and Genetic Engineering* in summer term of BS in Agriculture program. The department has got some good equipment and established a laboratory for practical teaching and research. To conduct research, the department has established collaboration with local and international research groups. Any proposal for collaborative research on any of the following topics of is welcome:

- Signal transduction pathways of motility, chemotaxis and differentiation of Peronosporomycete zoospores
- Microbial biopesticides and biofertilizers
- Traditional herbal medicines and their uses in agriculture
- Novel bioactive natural products from plant and microbes and their uses in agriculture
- Adaptation to climate change and food security

Some highly qualified faculty members are responsible for teaching undergraduate students and supervise students to conduct world-class research in biotechnology.

FACULTIES

Dr. Md. Tofazzal Islam
Professor

Dr. Md. Ashraful Haque
Associate Professor & Head

Dr. Md. Mahbubur Rahman
Associate Professor

Mr. Shah Mohammad Naimul Islam
Assistant Professor

DEPARTMENT OF CROP BOTANY

The department offers courses for undergraduate and postgraduate programs. The Department of Crop Botany has major research programs on: various physiological processes under normal and stressful conditions, plant nutrition, ecophysiology of different crops, hormonal regulation of crop growth and development, embryological aspects of fruit development and biochemical and nutritional aspects of fruits and vegetables.

Course Title : Plant Taxonomy & Economic Botany
Course Code : CBT 110
Course Credit : 3+1.5

A. THEORY: (3.0 Cr. hr.)

Plant Taxonomy:

Introduction: Taxonomy, Taxa, Botanical nomenclature etc.

Plant classification: Principles and Systems of classification.

External morphology: Root, stem, leaf, inflorescence, flower, seed and fruit.

Economically important families: Poaceae, Fabaceae, Cucurbitaceae, Tiliaceae, Brassicaceae, Asteraceae, Malvaceae, Areaceae, Rutaceae, Apiaceae, Liliaceae, Convolvulaceae etc.

Economic Botany:

Introduction: Scope and classification of economic plants.

Economic importance of plants and plant products: Beverage, Paper, Rubber, Timber, Oils and fats, Sugar, Spices and Condiments yielding plants and Medicinal plants (Especially emphasis will be given on scientific names, family names, plant part(s) used, plant products and their economic importance).

B. PRACTICAL (1.5 Cr. hr.)

Study on roots, stems, leaves, flowers, inflorescences, fruits and seeds
Family – Important families
Assignment – Herbarium
Visit to National Herbarium and Botanical Garden

Course Title : Plant Anatomy & Embryology

Course Code : CBT 255

Course Credit : 3+1.5

A. THEORY (3.0 Cr. hr)

Plant Anatomy:

Cell: Cell wall and membrane, Cell organelles and their ultra-structures, Meristem: Classification and functions, Tissue and tissue systems: Classification, structure and functions; Primary and secondary structure of monocot and dicot root, stem and leaf; Secondary growth in root and stem; Transition region; Anatomy of

some important crop plants.

Plant Embryology:

Introduction; Microsporangium, Microsporogenesis, and Microgametogenesis; Megasporangium, Megasporogenesis, and Megagametogenesis; Fertilization, seed and fruit development; Apomixis Formation of embryo.

B. PRACTICAL (1.5 (Cr. hr)

Demonstration of microscope and techniques slide preparation; Anatomy of roots, stems and leaves of some important monocot and dicot plants; Study on pollen grain structure and development.

Course Title : Plant Physiology

Course Code : CBT 350

Course Credit : 3+1.5

A. THEORY (3.0 Cr. hr.0

Plant water relationship:

Pathway and driving force of water movement from root to leaf, Mechanism of transpiration from the leaf, factors affecting transpiration process and guard cell movement.

Plant metabolism:

Organization of photosynthetic apparatus and pigment; Outline of biochemical phase and CO₂ reducing pathways of photosynthesis, and their significance; Outline of respiratory pathways (glycolysis and metabolism of glycolytic products), Interconversion and utilization of respiratory products.

Growth and growth regulators:

Concept of growth; Outline of the steps involving in sampling, data gathering, computation, data analysis and interpretation; Outlines and classification of growth regulators, Principles and uses of plant growth regulators in crop production.

Seed development process:

Seed and seedling development; Dormancy; Physiology of germination.

Photoperiodism and vernalization:

Concept of photoperiodism and its impact in crop growth, phytochrome and flowering hormones; Concept of vernalization in flowering process and its importance in agriculture. Ageing and senescence.

Stresses and resistance:

Concept of stress and strain, Resistance through escape, Avoidance and tolerance mechanism. Various kinds of stresses and means of encounter them. photomorphogenesis and phytochrome.

B. PRACTICAL (1.5 Cr. hr)

Study on osmosis, diffusion, transpiration, ascent of sap, respiration, chlorophyll pigments estimation, growth measurement etc.

Course Title : Plant Ecology

Course Code : CBT 465

Course Credit : 3+1.5

A. THEORY (3.0 Cr. hr.)

Introduction:

Concept, history and scope of plant ecology

The environment:

Concept of environment, environmental or ecological factors; Climatic factors- light, temperature, water, wind etc and their effects on crop production; Physiographic factors; Biotic factors, interaction among biotic factors, principles of crop weed association; macro- and micro environment- concept, microclimatic manipulation and improvement of crop production.

Ecosystem and community

Ecosystem: Concept, composition, classification and functioning of ecosystems; Community: Definition, composition and classification, study to plant community structure

Plant succession and Phytogeography:

Plant succession: Definition, causes of

succession, types and process of succession; Phytogeography: Principles governing plant distribution, plant conservation and preservation; causes of depletion of forest in Bangladesh and possible remedies, Plant diversification and biodiversity.

Population ecology:

Definition, characteristics and structure of plant population; interactions among populations, intra- and inter-specific competition

Environmental pollution:

Types, causes, effects and remedies with special reference to plant productivity; Greenhouse effects-causes and remedies.

B. PRACTICAL (1.5 Cr. hr)

Adaptation of plants in different habitats, Anatomy of hydrophytes, mesophytes and xerophytes, Anatomy of C₃, C₄, CAM and epiphytic plants, Field visits of different agro-ecological zones.

FACULTIES

Dr. Tofazzal Hossain

Professor

Dr. Jalal Uddin Ahmed

Professor & Head

Dr. Md. Abdul Baset Mia

Professor

Mr. Mohammad Atikur Rahman

Assistant Professor (Study Leave)

Mr. Totan Kumar Ghosh

Assistant Professor

Mr. Md. Haider Iqbal Khan

Assistant Professor

Mr. Md. Mohi-Ud-Din

Assistant Professor

DEPARTMENT OF ENTOMOLOGY

The department offers Undergraduate (BS Agriculture) courses and Graduate programs leading to MS and Ph.D degree. The Entomology department has a major research thrust on i) ecological and biological studies of insect pests and their natural enemies, their behavior for insect pest suppression, and management, ii) integrated pest management, iii) biological studies of pollinators and their utilization in vegetable seed production and migratory beekeeping for honey production, iv) environmental toxicology of pesticides and v) collection, identification and preservation of insect pests and their natural enemies.

Course Title : Insect Morphology

Course Code : ENT 215

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Introduction and general body form of insect and body wall process, Insect Head and its appendages, thorax and its appendages, abdomen and its appendages, respiratory system, circulatory system, nervous system, division and function of stomodeum, mesenteron and proctodeum of insect alimentary canal, association of centres of brain, sense organ and reproductive system.

Practical (1.5 Cr. hr.)

Studies on the external structure of insect head, antennae, mouthparts, wings and legs including their modification using grasshopper, field cricket, housefly, honeybee and other insects.

Course Title : Insect Taxonomy and Systematics

Course Code : ENT 250

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Introductory to basics of zoogeography; geological age; Arthropoda; short history of Entomology; Evolution of insects; Taxonomic collection and the process of preservation; Definition and terminology of taxonomy and systematics; Hierarchy of

categories

Basics of Insect Orders: Apterygota:
Thysanura, Diplura, Protura, Collembola,

Pterygota: Ephemeroptera, Plecoptera, Grylloblatodae, Orthoptera, Phasmida, Dermaptera, Embioptera, Dictyoptera, Zoraptera, Psocoptera, Mallophaga, Sphingoptera, Odonata, Hemiptera, Isoptera, Thysanoptera, Lepidoptera, Coleoptera, Hymenoptera, Diptera; Theories of classification, Basics of taxonomic characters, Taxonomic Publications, Briefly rules of zoological nomenclature.

Practical (1.5 Cr. hr.)

Insect collection and the process of preservation; Identification and familiarization of insects: Thysanura; Collembola; Odonata; Dermaptera; Dictyoptera; Orthoptera; Thysanoptera; Heteroptera; Homoptera; Diptera; Coleoptera; Lepidoptera; Hymenoptera; Identification and familiarization of insects of beneficial insects.

Course Title : Insect Ecology

Course Code : ENT 265

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Definitions, history and development; Approaches and scope of ecology; Population estimation: absolute and relative methods; Concept and components of ecosystem; Aquatic ecosystem; Terrestrial ecosystem; Ecological energetics: energy flow in the ecosystem-food chain, food web and trophic level; Dispersion and migration; Environmental factors & insect population; Match between organisms and their environment; Community; Ecological successions; Ecological processes; Interaction; Insect pest monitoring :Surveillance and forecasting.

Practical (1.5 Cr. hr.)

Sampling on insect pests and their damages on different crops; Methods of population estimation; Community composition, species richness and diversity of insects.

Course Title : Economic Entomology

Course Code : ENT 370

Course Credit : 3+1.5

Theory (3 Cr. hr.)

Basic concept of Economic Entomology; Types of pests and NE's, Apiculture: kinds, cast determination, life cycle, migratory beekeeping, diseases and pests of honey bees etc; Sericulture: classification, life cycle of different silkworm, larvae rearing, cocoon ripening, harvesting and spinning; Lac culture: Host plant preparation, different strains and rearing process of lac insects, manufacturing shellac, problem and prospect of apiculture, sericulture and lac culture; detail study of the major and minor insect pests of rice, sugarcane, jute, mango, jackfruit, coconut, banana, litchi, citrus, guava, cotton, vegetables mainly potato, tomato, brinjal, cauliflower, cabbage, bean, okra, bitter gourd, sponge gourd, pumpkin, hogplum etc; insect pests of stored grain products, rodent pests and insect pests of seeds emphasizing on life history, nature and extend of damage and management practices of those insects pests; Insect borne disease transmission and their management.

Practical (1.5 Cr. hr.)

study of different insects as vector, migratory beekeeping, study and collection of different products from sericulture and lac culture, study and collection of different insect infested parts (leaves, panicle, leaf sheath, stem and grains) of rice, jute, banana, citrus, jute, guava, cotton, jackfruit, sugarcane mango, summer and winter vegetables, stored grain pests, pesticidal calculation and judicial application in relation to EIL, ET, GEP, ED ; reaction of BRRI varieties of different rice insect pests and management practices.

Course Title : Insect Pest Management

Course Code : ENT 440

Course Credit : 3+1.5

Theory (3 Cr. hr.)

Ecological concepts of pests and Integrated Pest Management (IPM); Types of pests; Computation of economic injury level and

economic threshold, and their utility; History and principles of IPM and important definitions; Monitoring of pests for IPM; Building blocks of IPM : Tactics and tools of IPM; Cultural Practices: Definition, importance and application; Physical, mechanical and legal methods; Biological control: principles, strategies and safe application; Host plant resistance (Definition, importance and application) Chemical Control: Pesticides (Definition, History, Importance, Classification of pesticides); Mode of action of insecticides; Formulations of pesticides; Compatibility of pesticides; Hazards in the use of pesticides; Pesticide poisoning and treatment; IPM compatible insecticides; Bio-rationale Insecticides; IPM practice in Bangladesh (Farmers Field School); IPM in rice, Vegetables, Stored products.

Practical (1.5 Cr. hr.)

Insect monitoring tools; Agro-ecological System Analysis; Scouting of insect pests and damage assessment; Practicing of various cultural/mechanical control methods; Identification of seeds of resistant varieties ; Pesticides formulations and their utility; Usages of various pesticide appliances; Preparation of spray fluids using (EC, WP, botanicals).

FACULTIES

Dr. Md. Zinnatul Alam
Professor

Dr. Md. Mahbubar Rahman
Professor

Dr. Md. Ramiz Uddin Miah
Professor

Dr. Md. Ruhul Amin
Professor

Dr. Md. Mesbah Uddin
Associate Professor

Mr. Md. Ahsanul Haque Swapon
Associate Professor & Head

Mr. Md. Mamunur Rahman
Assistant Professor

Mr. Habibur Rahman
Assistant Professor

Mr. Md. Shamim Hossain
Lecturer

DEPARTMENT OF GENETICS AND PLANT BREEDING

The Department offers courses for Undergraduate program and Postgraduate studies leading to MS and PhD degree. The Genetics and Plant Breeding Department has major research program on the improvement of vegetables, oil seeds and cereal crops through conventional breeding, tissue culture and molecular approaches. The laboratories are fully equipped with modern instruments.

Course Title : Cytology
Course Code : GPB 203
Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Historical review, Cell and its components, Plant and animal cell, Prokaryotic and Eukaryotic cell, Cell organelles related to genetic importance, chromosome morphology, Cell cycle, mitosis and meiosis in diploid organisms, Euchromatin and heterochromatin, Effect of different physical and chemical agents on chromosomes, Banding pattern, Karyotype- characteristics, variation and its role on speciation

Practical (1.5 Cr. hr.)

Techniques in cytological studies-microscopy and staining, Preparation of fixing agents and stains, Mitosis and meiosis study, Preparation of permanent slide

**Course Title : Elementary Genetics,
Evolution and
Biodiversity**
Course Code : GPB 235
Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Historical review, Law of inheritance-law of segregation and law of independent assortment, Modifications of laws- gene interaction and lethality, Multiple allele and pseudo allele, isoallele, test of allilism, Multiple factor hypothesis-concept of hypothesis and example, Penetrance expressivity, pleiotropy, modifier, phenocopy and lethal genes, Linkage-definition, coupling and repulsion phase, types of linkage, detection of linkage, significance of linkage, Crossing over-definition and concept of crossing over, construction of linkage map, interference and coincidence, significance of crossing over, Gene- classical and modern concept, evidence of DNA as genetic material, structure and replication of DNA, genetic code, biological importance of DNA, Microbial genetics- genetics of bacteria, virus, plasmid, transposable genetic elements, Recombinant DNA technology-concept, steps of making recombinant DNA, application, Evolution- concept, theories, evidence, origin of species, Biodiversity-concept, level, threats, significance, conservation.

Practical (1.5 Cr. hr.)

Problems related to mono, di and trihybrid cross, Chi square test, Gene interaction, Measurement of linkage from F_2 and back cross data, Construction of genetic map using linkage test, Problems related to multiple allele

**Course Title : Introductory
Cytogenetics**
Course Code : GPB 310
Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Historical reviews, Ultra structure and composition of chromosome, physical and chemical basis of heredity, Special types of chromosomes- B- chromosome, iso-chromosome, telocentric chromosome, lampbrush chromosome, polytene chromosome sex chromosome and sex linked inheritance, Structural changes of chromosomes-deletion, duplication, translocation and inversion, Numerical changes of chromosomes- euploidy, aneuploidy and meiosis on polyploids, Mutation- definition, types, agents of mutation, mode of action of mutagens, application and limitation, Cytolplasmic inheritance-plastid and mitochondrial DNA, Haploidy- mechanisms of haploid induction and its application in crop improvement

Practical (1.5 Cr. hr.)

Identification of chromosomes, Induction of polyploidy, Study on numerical and structural changes of chromosomes.

**Course Title : Principles of Plant
Breeding**
Course Code : GPB 355
Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Historical review, scope and importance of plant breeding, Crop evolution-hybridization, mutation and polyploidy, Centre of origin and centre of diversity, Domestication- natural and artificial changes of traits under domestication, Pollination

control mechanism in crop plants- incompatibility its cause and significance in crop improvement, male sterility- types, causes and significance in crop improvement, Crop genetic resources- conservation , evaluation and utilization, Consequence of selfing and hybridization, mating system, population structure, combining ability, full sib, half sib, Genetic composition of self and cross pollinated crops-HW law of equilibrium in population, concept and theory of heterosis, inbreeding depression, heritability, genetic advance, inheritance of qualitative and quantitative characters, Apomixis- its types, genetic basis and application in crop improvement.

Practical (1.5 Cr. hr.)

Observation of sporogenesis, gametogenesis and fertilization in crop plants, Assessment of pollen fertility and sterility of crop plants under microscope by staining methods, Study on floral biology of crop plants and sex expression of crop plants, Assessment of heritability and genetic gain, Estimation of heterosis and inbreeding depression in crop plants,

Course Title : Methods of Plant Breeding

Course Code : GPB 465

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Variability and crop improvement, Biometrical approach in plant breeding, Variety and cultivars in plant breeding, Breeding methods for Self pollinated crops- introduction and acclimatization, mass selection and pure line selection, pedigree and bulk, method, modified bulk and SSD

method, back cross breeding for dominant, recessive and polygene, Breeding methods for cross pollinated crops- introduction, intra and inter population improvement, Concept of synthetic and composite variety development, Hybrid variety development, Breeding methods for clonally propagated crops- introduction, hybridization, and clonal selection with special reference to potato and sugarcane, Polyploidy breeding, Mutation breeding, Double haploid production, Breeding techniques in economic crops -rice, maize and sugarcane etc, Distant hybridization- definition, scope, barriers and its need in crop improvement, Introduction to national and international organizations involve in crop improvement, Variety release system in Bangladesh

Practical (1.5 Cr. hr.)

Assessment of variability- mean, standard deviation, variance, PCV, GCV, significant test, LSD and DMRT, Hybridization techniques- procedure of hybridization, floral biology, pollination system and crossing technique in rice, wheat, maize, tomato, peas, mustard, jute and cotton, Recording data on qualitative and quantitative traits in different crop plants, Visit to breeding institute and seed companies

FACULTIES

Dr. M.A. Khaleque Miah
Professor

Dr. Md. Golam Rasul
Professor

Dr. Nasrin Akter Ivy
Associate Professor

Dr. Mohammad Mehruz Hasan Saikat
Associate Professor

Dr. A.K.M. Aminul Islam
Associate Professor & Head

Mr. Umakanta Sarker

Associate Professor

Mohammad Sharif Raihan

Assistant Professor (Study leave)

Rawnaq Nazneen Chowdhury

Assistant Professor

DEPARTMENT OF HORTICULTURE

The Department offers courses for Undergraduate (BS) program and Postgraduate studies leading to MS and PhD degree. The Department of Horticulture offers 05 undergraduate courses and 16 postgraduate courses along with practical oriented laboratory classes. The department has a well facilitated undergraduate laboratory and two post graduate laboratories (1 general + 1 tissue culture laboratory). The department has also a well developed research field in which teachers and students conduct their researches. The department has major research programs on improvement of horticultural crops, production technology, post harvest technology and processing, seed production, biotechnology and marker aided selection of horticultural crops

Course Title : Fundamentals of Horticulture

Course Code : HRT 140

Course Credit : 3+1.5

Course Content: Economic importance and classification of horticultural crops and their culture - nutritive value - area, production exports and imports - fruit and vegetable zones of Bangladesh. Soil and climate - vegetable gardens - kitchen garden and other types of gardens. Planning and layout and management of orchard and planting systems. Horticultural production practices for vegetable crops, nursery techniques and management of vegetable crops - principles and methods of pruning and training of horticultural crops. Water management - weed

management - fertility management in horticultural crops, cropping system. Bearing habits - factors influencing the fruitfulness and unfruitfulness and rejuvenation of horticultural crops - principles of organic farming, hydroponics in vegetable production – harvesting, post harvest handling, processing and marketing and storage of horticultural crops.

Course Title : Vegetable and Spices Production

Course Code : HRT 255

Course Credit : 3+1.5

Course Content: Importance and scope of vegetable production. Classification of vegetables. Vegetable farming. Cropping system. Nursery management and seedling transplanting. Climate, soil and nutrient requirement of vegetables. Production technology of cole crops, root crops. Tuber crops, solanaceous, cucurbits, leguminous and other miscellaneous vegetables. Hydroponics technique in vegetable production. Techniques of vegetable seed production. Post harvest handling, storage and processing of vegetables. Marketing and exports of vegetables.

Scope and importance of spice crops. Classification of spices. Production technology of chilli, onion, garlic, ginger, turmeric, coriander, cumin, black pepper, cinnamon, cardamom, clove and bay leaf and other important spices.

Course Title : Fruits and Plantation Crop Production

Course Code : HRT 280

Course Credit : 3+1.5

Course Content: Status of fruit production in Bangladesh. Production technology of major fruits (Mango, Jackfruit, Litchi, Banana, Ber, Guava, Papaya, Pineapple), Minor fruits (Pomello, Amra, Sapota, Bael & Cothbael, Lotkon, Palmyra Palm, Tamarind, Anonaceous fruit, Bilati Gab & Chalta), Exotic fruits (Apple, Pear, Grape, Passion fruit, Strawberry, Dates, Cashew nut) and plantation crops (Tea, Coffee, Rubber) of Bangladesh.

Course Title : Floriculture and Landscape Horticulture
Course Code : HRT 370
Course Credit : 3+1.5

Course Content: Scope and importance of floriculture. Classification, propagation and pruning. Production techniques of flowering plants like rose, marigold, chrysanthemum, dahlia, tuberose and other bulbous plant, carnation, gladiolus, gerbera, jasmine, house plants, orchid, cacti and other succulents. Importance, cultivation and uses of ornamental trees, climbers, shrubs and hedges. Post harvest technology of cut flowers in respect of commercial flower crops. Landscaping, basic principles and components. Principals of gardening, styles of gardening, lawn making and management, methods of designing rockery, water garden, botanical garden etc. Floral arrangement. Making bonsai.

Course Title : Propagation and Nursery Management
Course Code : HRT 415
Course Credit : 3+1.5

Course Content: Plant propagation, Seed propagation: advantage and disadvantages, Seed germination & Dormancy, Seed formation, Seed development, Vegetative propagation: Methods, advantages & limitation, Propagation by specialized vegetative structures, Propagation by apomictic seedling, Techniques of propagation by cutting, Cutting and its factors, Use of plant growth regulators in rooting of cutting, Layering, Theoretical aspects of grafting & budding, Methods of grafting, Graft incompatibility, Methods of budding, Union between stock & scion, Factors affecting the healing of graft or bud union, Tissue culture and Micropropagation.

FACULTIES

Dr. M. Mofazzal Hossain
Professor

Dr. M. Mizanur Rahman
Professor

Dr. Mohammad Zakaria
Associate Professor & Head

Dr. Md. Azizul Hoque
Associate Professor

Mr. Emrul Kayesh
Assistant Professor (Study Leave)

Mr. Jahidul Hassan
Assistant Professor

Mr. Md. Sanaullah Biswas
Assistant Professor (Study Leave)

Mr. Md. Mijanur Rahman Rajib
Assistant Professor

DEPARTMENT OF PLANT PATHOLOGY

The department of Plant Pathology offers courses for Undergraduate studies and Graduate program leading to M. S. and Ph. D. degrees. The department has major programs on disease management, mycology, nematology, virology, bacteriology and general plant pathology. It has well developed laboratories with modern facilities.

Course Title : Fundamentals of Plant Pathology
Course Code : PLP 212
Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

1. Introduction

- (i) Definition of Plant Pathology
- (ii) What is plant disease? (Concept of plant disease.
- (iii) Objective of plant pathology.
- (iv) Significance of plant disease.
- (v) Important diseases occurred in Bangladesh.
- (vi) Causal agents of plant diseases

- a. Animate causes (infectious disease)
Fungi, Bacteria, viruses, nematodes, rickettsia like organism, phytoplasmids & spiroplasma, algae and phanerogamic parasite

- b. Inanimate causes (non-infectious diseases): Abnormal temperature, humidity, rainfall, air flow, light, inadequate oxygen, air pollution, deficiency or excess supply of nutrients, soil minerals, toxic to plants, pesticide injuries, improper cultural practices.

(vii) Brief history of plant pathology

2. Fungi

- (i) General characteristics of fungi
- (ii) Vegetative structures: Fungal cell structure, thallus, modifications of fungal hyphae (plectenchyma: prosenchyma, pseudoparenchyma), rhizomorph, sclerotium, chlamydospore, haustoria, mycorrhiza (ectomycorrhiza, endomycorrhiza, ectomycorrhiza)
- (iii) Reproduction in fungi: vegetative, asexual and Sexual.
- (iv) Classification of fungi : Mastigomycotina and Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina.
- (v) Study on the characteristic features of class, order and family of the following genera:
Synchytrium, Phythium, phytophthora, paonospora, Albuga, Rhizopus, Saccharomyces, penicillium, Aspergillus, Erysiphae, Claviceps, Puccinia, Uslagi & Agaricus.

3. Bacteria

- (i) General characteristic
- (ii) Morphology: Cell size, cell shape, cell rigidity & flexibility, cell boundary layers : membrane and cell wall.
- (iii) Cell arrangement, flagellation and locomotion
- (iv) Capsule and other surface structure.
- (v) Bacterial nucleus and other intracellular organelles
- (vi) Cell division and reproduction and Variability in bacteria.

(vii) Genera of plant

pathoge.....*Clavibacter* (*Corynebacterium*), *Ewinia* (*pantoea*), *Pseudomonas*, *Ralstonia*, *Streptomyces*, *Xanthomonas*, *Syllela*.

(viii) Phytoplasma & Spiroplasma: Characteristics.

4. Nematodes

- (i) General characteristics
- (ii) Morphology and anatomy : Body colour, body symmetry, body shape, body size, body wall
- (iii) Lip or cephalic or head region: oral aperture or prestoma, stoma, buccal cavity or stomata cavity.
- (iv) Tail.
- (v) Digestive systems: Stylet, esophagus, intestine, rectum, and anus.
- (vi) Reproductive system: Female reproductive system – ovary, uterus, oviduct, vagina, spermatheca; and male reproductive system: testis, seminal vesicle, and vasdeferens.

5. Viruses and Viroid

- (i) What is virus and viroid?
- (ii) Characteristic of plant viruses: Morphology, viral structure
- (iii) Composition and structure of viruses
- (iv) Infection Virus infection
- (v) Grouping of viruses.

6. Algae

- (i) Characters of algal parasite
- (ii) Example of and algal disease: Red rust of mango, guava and citrus caused by algae.

7. Parasitic flowering plants

- (i) Parasitism: Epiphytes, Hemi-parasites, Holoparasite.
- (ii) Classification of the parasitic flowering plants: Stem parasites (Semi-parasites: Dendrophthoe or Loranthus, Holoparasites: Cuscuta, Root parasites: Holoparasites (Orobanchae), Semi-parasites (Striga).

Practical (1.5 Cr. hr.)

1. Laboratory Methods
 - (i) Lab equipment and instruments
 - (ii) Microscopy.
 - (iii) Nutrition of fungi (metallic element, non-metallic, macro elements, micro elements)
 - (iv) Culture of plant pathogenic microorganisms in the laboratory
2. Study on symptoms of plant diseases.
3. Preparation of specimens of plant pathogens and observation under a compound microscope.
4. General characters of fungi
5. General characteristics of nematode
6. Culture of fungi in the laboratory
7. Study on Zygomycetous fungi
8. Study on Ascomycetous fungi.
9. Study on Imperfect fungi
10. Study on parasitic higher plants.

Course Title : Principles of Plant Pathology

Course Code : PLP 315

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

1. Introduction to Principles of Plant Pathology: Some historical and Present examples of losses caused by plant diseases, plant disease and world crop production.
2. Pathogenesis: Parasitism and pathogenicity, chain of events in disease development; disease cycle; Role of toxins in disease development; Effect of pathogens on plant physiology.
3. Ecology, survival and mode of spread of plant pathogens-fungi, bacteria, viruses and nematodes.
4. Epidemiology of plant disease and disease triangle; Factors of epiphytotic development of plant disease; Inoculum potential and Disease potential; Disease severity.
5. Introduction to Molecular Plant Pathology.

6. Disease surveillance, assessment of disease intensity, disease forecasting and yield loss assessment.
7. Principles of plant disease management: Exclusion, eradication protection, legislative, immunization and resistance.
 - (i) Quarantine: Domestic, international, embargo and phytosanitary certificate, Eradication- Eradicants, Physical, chemical and cultural methods of eradication.
 - (ii) Protection: Cultural, Biological and chemical; classification of fungicides-protections, eradicants, therapeutants; copper, sulfur, mercury, heterocyclic nitrogenous compounds, systemic fungicides and antibiotics; characteristics of ideal fungicides; formulation of fungicides; methods of application of fungicides-seed, soil and foliar applications, special methods; compatibility with other pesticides; phytotoxicity of fungicides, shelf life of fungicides; precautions and safety measures during handling fungicides.
 - (iii) Host resistance: Type of resistance-vertical and horizontal resistance: Variation in plant pathogens, genetics of host parasitic interaction, mechanisms of resistance, mechanical and chemical, pre-infectional and post-infectional defense mechanism.
 - (iv) Biological control of plant diseases: Antagonistic fungi, bacteria, mycorrhizal fungi, bacteriophages, plant products and antiviral principles.
 - (v) Biotechnological approaches to control plant diseases: Production of virus free plants

by meristem culture, somaclonal variation, Genetic engineering-plant clinic, organization and their role in disease management.

8. Integrated approach to control crop diseases.

Practical (1.5 Cr. hr.)

1. Inoculation techniques of fungi, bacteria, viruses and nematodes
2. Practice of Koch's Postulate
3. Formulation of fungicides, calculation of dosage and preparation of fungicidal suspensions.

4.

Appliances for application of fungicides and nematicides.

5. Demonstration of methods of application of fungicides- seed treatments, soil and foliar application, laboratory and field evaluation of fungicides.
6. Multiplication and application of biocontrol agents for disease control.
7. Study of phytotoxicity.
8. Visit to Plant Quarantine Station
9. Each of the students is required to submit a comprehensive report on the prepared herbarium, spray experiment and field excursion.

Course Title : Diseases of field crops

Course Code : PLP 340

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Etiology, symptoms, mode of spread, survival of pathogen, epidemiology, disease cycle and management of diseases of different field crops:

- (i) Diseases of cereals: Rice, wheat, maize, sorghum, barley, millets.
- (ii) Diseases of fibre crops: Jute, kanaf, mesta, cotton.

- (iii) Disease of oil seeds: Mustard, sesame, sunflower, groundnut, soybean,
- (iv) Disease of Pulses: Blackgram, mungbean, greengram, peas, lentil, chickpea, cowpea.
- (v) Diseases of sugar crops: Sugarcane, sugarbeet.

Practical (1.5 Cr. hr.)

1. Collection and preservation of disease specimens.
2. Study of symptoms and causal agents of the major diseases of rice, wheat, maize, jute, sugarcane and pulse and oil seeds.
3. Visit to fields for observation and collection of disease specimens.
4. Each student needs to submit a herbarium having at least 50 disease specimens.

Course Title : Diseases of Horticultural and Plantation Crops

Course Code : PLP 440

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Etiology, symptoms, mode of spread, survival of pathogen, epidemiology, disease cycle and management of diseases of different horticultural crops.

- (i) Disease of jFruits- Mango, Banana, Grapes, Citrus, Guava, Papaya, Coconut, Pineapple, Jackfruit, Water Melon & Muskmelon.
- (ii) Disease of Vegetables- Brinjal, Tomato, Cauliflower, Cabbage, Radish, Potato, Sweet potato, Okra, Beans & Cucurbirs.
- (iii) Diseases of Spices: Chilies, Turmeric, Ginger, Onion, Garlic, & black pepper.
- (iv) Diseases of Flowers: Rose, Chrysanthemum, Marigold, Dahlia & Tuberose.
- (v) Disease of seedlings in the nursery and seedbed.
- (vi) Diseases of agro-forestry trees.

- (vii) Disease of narcotic and beverage crops: Tea, tobacco, betelnut, betelvine.
- (viii) Disease of important medicinal plants.

Practical (1.5 Cr. hr.)

1. Study on symptoms and causal agents of the major diseases of the important fruit, vegetable, spices and narcotics & beverage crops.
2. Study on symptoms and causal agents of the major disease of the nursery.
3. Visit to fields for observation and collection of disease specimens.
4. Each student needs to submit a herbarium of 50 disease specimens.

Course Title : Post Harvest Pathology

Course Code : PLP 480

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Seed Pathology

1. Introduction to seed Pathology: Seed-borne diseases of crops and their significance in crop production, list of major seed-borne diseases of major crops of Bangladesh.
2. Mechanism of seed transmission of pathogens.
3. Seed health test.
4. Production of disease free seeds of major crops grown in Bangladesh.
5. Deterioration of seeds in storage.

Post harvest Pathology:

6. Concepts of post harvest loss of vegetables, fruits, tuber & root crops and spices of perishables: Transit, storage and market loss; Extent of post harvest loss and its
 - (i) Harvesting of produce- Concept of maturity, maturity indices, considerations during harvesting, pre-harvest treatment of produce-

trimming, cleaning, water elimination, curing, waxing and grading.

- (ii) Packing house preparation- purpose and function of packing house, packaging and transport of produce- Functions of packaging, damage caused during packaging, types of packages, manual packing, improving package performance.
- (iii) Transportation-Bulk transport condition.
- (iv) Storage and marketing- Storage and market environment and duration.

7. Post harvest disease: Types of diseases, sources of infection, factors affecting disease development.
8. Management of post harvest diseases.

Practical (1.5 Cr. hr.)

1. Demonstration of the methods on seed health testing-dry inspection, incubation method, growing on test.
2. Seed treatment against seed-borne pathogen.
3. Seed treatment against seed-borne pathogen.
4. Visit to the market to collect post harvest diseases and loss assessment.

FACULTIES

Dr. Md. Ismail Hossain Miah
Professor

Dr. Md. Abdul Mannan Akanda
Professor

Dr. Md. Khurshed Alam Bhuiyan
Professor

Dr. Md. Abu Ashraf Khan
Professor & Head

Dr. Md. Motaher Hossain

Assistant Professor (Study leave)

Ms. Farhana Begum

Assistant Professor

Mr. Md. Mahidul Islam Masum

Assistant Professor (Study leave)

Mr. Md. Abdullahil Baki Bhuiyan

Assistant Professor (Study leave)

Dr. Rayhanur Zannat

Assistant Professor

DEPARTMENT OF SOIL SCIENCE

The department offers courses for Undergraduate program as well as graduate programs leading to M. S. and Ph.D. degrees. Soil Science department has major programs in physical, chemical and biological aspects of soil management. The laboratories are enriched with sophisticated analytical instruments such as atomic absorption spectrophotometer, gas-chromatograph, aggregate analyzer, pressure plate apparatus etc. for advanced research works and practical classes.

Course Title : Soil Chemistry

Course Code : SSC 165

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Concept of soil; Rocks and minerals: their classification and properties; Weathering processes; Soil forming factors and processes; Soil profile; Soil P^H : causes of soil acidity and alkalinity, buffering capacity, effects on nutrient availability; Liming: liming materials, effects on soil properties; Silicate clays: classification and characteristics; Ion exchange: sources of negative charges on soil colloids, cation and anion exchange phenomena. Concept of environmental pollution; Heavy metals: contamination in soils, water and crops; Arsenic poisoning in Bangladesh.

Practical (1.5 Cr. hr.)

Precautions to be taken in the laboratory; Collection and preparation of soil samples; Identification of rocks and minerals; Determination of soil p^H Determination of electrical conductivity and cation exchange capacity.

Course Title : Soil Physics

Course Code : SSC 225

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Major components of soil; Soil separates; Soil texture; Soil structure; Particle density; Bulk density; Soil porosity; Soil color; Soil water; Soil air; Particle size analysis; Stokes law; Soil consistency: plastic limits, forms of soil consistency; plough pan; Soil water constants; soil water potentials; Water movement in soil: Infiltration, Hydraulic conductivity, Darcy's law; Evapotranspiration and Consumptive use of water; Irrigation scheduling of crops; Thermal properties of soil. Soil temperature, heat capacity, thermal conductivity.

Practical (1.5 Cr. hr.)

Moisture content; Particle size analysis and textural class; Maximum water holding capacity; Bulk density; Particle density; Soil porosity; Soil water tension; Saturated hydraulic conductivity; Soil consistency.

Course Title : Soil Fertility and Management

Course Code : SSC 355

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Concept of soil fertility and productivity; Plant nutrients: essential elements, criteria of essentiality, macro and micronutrients, available forms; physiological roles and deficiency symptoms of plant nutrient; Nitrogen: nitrogen cycle, mineralization, denitrification, volatilization, nitrogen fixation, fate of nitrogen; Phosphorus: fixation and availability; Potassium: occurrence, fixation and availability; Sulfur: S-cycle, S-oxidation and reduction; Zinc: occurrence and availability; Boron:

occurrence and availability; Organic matter: source, function, C:N ratio; depletion and maintenance of organic matter; Integrated nutrient management; Manure and fertilizer; Time and methods of fertilizer application; Methods of fertility/evaluation; Fertilizer recommendation; Soil fertility problem, problem soils and management in Bangladesh.

Practical (1.5 Cr.hr.)

Determination of total N in soil; Determination of available P, exchangeable K, available S; Determination of P and K in plant; Lime requirement of soil.

Course Title : Soil Microbiology

Course Code : SSC 365

Course Credit : 3+1.5

Theory (3.0 Cr. hr.) Classification of soil organisms; macro and micro-organisms, concept of protista, Haeckel's and Whittaker's classification, classification of bacteria and algae; Role of microorganisms in soil fertility; Biological nitrogen fixation (BNF): symbiotic and non-symbiotic nitrogen fixation; *Rhizobium*-Legume symbiosis; *Azolla-Anabaena* symbiosis; phosphorus solubilizing bacteria; Uses of biofertilizers in agriculture; classification and functions of mycorrhiza; Rhizosphere effects on microorganisms and soil fertility; Microbial decomposition of organic matter; Biodegradation of pesticides in soil.

Practical (1.5 Cr. hr.)

Sterilization techniques; Preparation of bacterial media; Culturing of bacteria; Motility test; Gram staining; Collection of nodules, isolation and authentication of *Rhizobium* from legume root nodules; Isolation of *Azotobacter* from soil; Identification of heterocyst us and non-heterocyst us blue-green algae (BGA) from soil; Preparation of bacterial and Blue-green algal biofertilizers; Total count of bacteria/BGA in inoculants.

Course Title : Soil Conservation, Survey and Classification

Course Code : SSC 401

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Concept on soil conservation; Soil erosion: classification, factors affecting soil erosion, universal soil loss equation (USLE), methods of controlling soil erosion.

Concept on soil survey and classification; Purposes and types of soil survey; Soil Mapping, Base materials of soil survey, Soil correlation and interpretation, report preparation; GIS and remote sensing; Land capability and crop suitability classification, USDA soil taxonomy: Bangladesh soils; Soil differentiating criteria; Soil categories; Physiographic units of Bangladesh soils; Principles of AEZ classification; Crop productivity potential and constraints of different AEZs.

Practical (1.5 Cr. hr.)

Determination of soil organic carbon; Determination of aggregate stability of soil (water stable aggregate); Determination of infiltration characteristics of soil. Approximation of soil texture by finger feel method; Determination of soil color by Munsell's color chart; study of soil profile; Identification of soil series.

Course Title : Agricultural and Agro-Industrial Chemistry

Course Code : SSC 440

Course Credit : 3+1.5

Theory (3.0 Cr. hr.)

Fertilizer: properties, quality control; Fate of fertilizers in soil: nitrogenous, phosphatic and potashic fertilizers; Pesticides: classification, mode of action and effects on environment. Fertilizer chemistry: manufacturing process of urea, ordinary super phosphate and triple super phosphate; Types and composition of potash ores; 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 byproducts; Tea: Ideal condition for tea cultivation manufacturing process and change of chemical composition in tea leaves, aroma, tea infusion. Liquoring quality tea.

Practical (1.5 Cr. hr.)

Manure and fertilizer analysis: cow dung, poultry manure, urea, triple super phosphate (TSP), muriate of potash (MP), gypsum, zinc sulfate, borax; Pesticide residues analysis.

FACULTIES

Dr. A.J.M. Sirajul Karim

Professor

Dr. A.R.M. Solaiman

Professor

Dr. G.K.M. Mustafizur Rahman

Professor

Dr. Md. Shafiqul Islam

Professor

Dr. Md. Younus Miah

Associate Professor

Dr. Md. Mizanur Rahman

Associate Professor & Head

Mr. Mohammed Zia Uddin Kamal

Assistant Professor (Study leave)

Mr. Mohammad Saiful Alam

Assistant Professor (Study leave)

programs. It has a computer lab. having facilities for statistical analyses for the students.

Course Title : Basic Statistics

Course Code : STT 270

Course Credit : 3+1.5

Theory (3.0 Cr. hr.) & Practical (1.5 cr.)

Definition and scope of statistics, Statistical data and their presentation (grouped and ungrouped data), Variables (qualitative and quantitative, continuous and discrete), Summarization of data (frequency distribution), Presentation of data (tabular and graphical), Statistical measures (central tendency and dispersion) and their uses, Population and sample, the importance of sample in biological inferences, Probability and Probability distribution (continuous and discrete), Introduction to regression and Correlation, Basic principles of statistical inference, hypothesis assumption and test of significance, Introduction to independence of attributes and chi-square test, z, t and F tests.

FACULTIES

Dr. Khandoker Saif Uddin

Professor (Lien)

Prof. Md. Mujibur Rahman

Visiting Professor

Dr. Md. Roshidul Hasan

Associate Professor & Head

Mr. Mohammad Nazmol Hasan

Assistant Professor

Nasrin Sultana

Lecturer (maternity leave)

Keya Rani Das

Lecturer

DEPARTMENT OF STATISTICS

This is a supporting department offering courses for Undergraduate and Graduate

**DEPARTMENT OF COMPUTER
SCIENCE & INFORMATION
TECHNOLOGY**

This is a newly developed supporting department offering courses for Undergraduate and Graduate programs. It has a computer laboratory.

**Course Title : Fundamentals of
Computer Science**

Course Code : CST 101

Course Credit : 3+1.5

Theory (3 Cr. hr.) & Practical (1.5 Cr. hr.)

Computer concept, Generation of computer, Classification of computer, Organization of computer, Input and output devices, Memory units (primary and secondary memory), Function of computer, Computer system (hardware, software, human-ware, firmware), Software classification, Introduction to data, Information, and files, Application of computer in agriculture (offline and online database), Data representation (Decimal, Binary, Octal, and Hexadecimal), Data conversion, Operating system, Working with operating system (Windows Environment), Word Processing, Working with Word processing software (Microsoft word), Spread sheet Analysis, Working with Spread sheet software (Microsoft Excel).

**Course Title : Information and
Communication
Technology for
Agricultural
Development**

Course Code : CST 405

Course Credit : 3+1.5

Theory (3 Cr. hr.) & Practical (1.5 Cr. hr.)

Introduction to ICT, use of ICT in agriculture, ICT infrastructure, Basic networking concepts and components, Types of Network, Architecture of network, Working with LAN, Basic concepts of Internet, Classification of Internet, Use of Internet for agricultural Information access and dissemination process, Using social media for agricultural communication.

Data and Information, Data processing activities, Data structure (Stack, and Queue), Concept of database, Database management systems (DBMS), and relational Database management systems (RDMS), Creating, storing and retrieving database.

Introduction to Geographical Information Systems (GIS), Components of GIS, Application of GIS in Agriculture, use of GIS tools in Agriculture.

FACULTIES.

Dr. Md. Roshidul Hasan
Associate Professor & Head

Mr. Gonesh Chandra Saha
Lecturer