Minutes

of the ordinary meeting of the Board of Studies of the Department of Botany held on Tuesday, 07th June, 2016 at 12:30 p.m. in the Conference Hall of the department. The following were present:

1. Prof. Mohammad Anis
2. Prof. Nafees Ahmad Khan
3. Prof. Irshad Mahmood
4. Prof. (Mrs.) Ghazala Parveen
5. Prof. Mansoor A. Siddiqui
6. Prof. M. Badruzzaman Siddiqui
7. Prof. Abrar A. Khan
8. Prof. Hisamuddin
9. Prof. Tabreiz Ahmad Khan
10. Prof. Samiullah Khan
11. Prof. Zaki A. Siddiqui
12. Prof. Shamsul Hayat
13. Prof. Fareed A. Khan
14. Prof. (Mrs.) Razia Khatoon Zaidi
15. Prof. (Mrs.) Sheila Shahab
16. Prof. Altaf Ahmad
17. Dr. (Mrs.) Kiran Lata Chauhan
18. Dr. Athar A. Khan
19. Dr. Qazi Fariduddin
20. Dr. (Mrs.) Shahla Faizan
21. Dr. Anwar Shahzad
22. Dr. (Mrs.) Fauzia Naushin
23. Dr. Asim Masood
24. Dr. Tariq Aftab
25. Prof. M. Yunus Khalil Ansari (In the Chair)

The following items were considered and approved:

Item No. 1

i. Item No.02 of the minutes of the meeting of BOS held on 09.09.2015 was confirmed as it was agreed upon to formulate course -13 of M.Sc. II Semester "Plant Physiology and Metabolism of 04 credits by merging 02 credits each of course -13 Plant Physiology of M.Sc. II Semester and course -19 Plant Metabolism of M.Sc. III Semester.

ii. Course IX Plant Resource Utilization and Conservation of M.Sc. II Semester will be of 02 credits.
iii. In M.Sc. III Semester course-19 ‘Environmental Sciences’ of 02 credits was introduced.

iv. Minutes of the meeting of BOS held on 22.12.2015 was confirmed and the matter was resolved in the meeting of the Hon’ble Vice Chancellor, Dean, Faculty of Life Sciences and Chairman, Department of Botany held on 30.04.2016 as mentioned in the minutes communicated by the Dean vide D. No.1946/FLS dated 02.05.2016. The provision of RA and JRF under DST-PURSE II Programme was as follows:

   (i) RA – 1
   (ii) JRF - 2

v. The minutes of the meetings of BOS held on 18.04.2016 was confirmed after the item No.03 and 04 regarding research labs, Room No.39 and 63 respectively, the decision taken in the meeting of BOS was replaced by the decision made in the meeting of the Hon’ble Vice Chancellor, Dean, Faculty of Life Sciences and Chairman, Department of Botany held on 30.04.2016 in the Vice Chancellor’s Office and communicated by the Dean vide D. No.1946/FLS dated 02.05.2016. The decision taken regarding these items as “There will be no alteration in allotment of research labs in the Department of Botany. The status quo of these labs as or before 25.02.2016 will continue” till Hon’ble Vice Chancellor speaks to teachers of Botany Department.

Item No. 2
The Board approved to offer following five elective papers of specialization at M.Sc. Final in the session 2016-17.
1. Plant Pathology
2. Advanced Plant Physiology
3. Cytogenetics and Plant Breeding
4. Environmental Botany
5. Plant Biotechnology

Item No. 3
The Teaching allocation for Under-graduate and Post-graduate courses for the session 2016-2017 was considered and approved. (Annexure I)

Item No. 4
The board considered and approved revision of papers and syllabi according to CBC System 2016-17: (Annexure II)
Item No. 5  Matter related to research:

The board considered and recommended minor changes (specifications)/ major changes in the title of Ph.D. programme of the following students.

(a) Minor changes/specifications

1. Ms. Farha Ashfaque (D.O.R:06.05.2014, En. No.GG-2908) - Ph.D.
   
   **New Topic**
   “Physio-morphological studies, absorption and distribution of Cd, Cr and Pb grown under combination of NPK, flyash and vermicompost in mustard (*Brassica juncea* L.)”

   **Old Topic**
   “Absorption and distribution of Cd, Cr and Pb grown under combination of NPK, flyash and vermicompost in mustard (*Brassica juncea* L.)”

   
   **New Topic**
   “Response of Some Medicinal Plants to Smoke-Saturated Water and Karrikin (KAR1)”

   **Old Topic**
   “Study of Smoke Saturated Water and Karrikin (KAR1)-Mediated Changes on Seed Germination of Some Medicinal Plants”

(b) Major changes/specifications (As per CASR minutes held on 24.05.2016)

   
   **New Topic**
   Bioavailability of cadmium, nickel and lead in a plant-aphid-ladybird food chain

   **Old Topic**
   Occurrence, uptake, accumulation and biomagnification of metals in ecosystem and their consequences

(c) Change of supervisor/ Appointment of Co-supervisor

As per directive of CASR minutes, dated 24.05.2016, it was decided that Prof. A. Hamid Wani, Department of Botany, Kashmir University, Srinagar will be the Co-supervisor and the Chairman, Department of Botany, AMU will be the Supervisor of Mr. Afaan Fazili since Mr. Afaan Fazili has completed 15 months on the given topic so the same topic may be continued for his research.
(d) For Special leave to reside outside the Aligarh

i. The board considered and recommended 06 months leave as a special case for Ms. Afseehn Shahid to visit Germany under DAAD Sandwich Model Scheme.

ii. The board considered and recommended 12 months leave w.e.f. 20.06.2016 as a special case for Mr. Razzak Hussain working under the supervision of Prof T. A. Khan to go to CUHP Dharamshala, Himachal Pradesh for his research work under Co-supervisor Dr. Yusuf Akhtar.

Item No. 6: Any other item(s).

The board considered and screened the names of panel of experts for the evaluation/assessment of work done by Dr. Anwar Shahzad for promotion to the post of Associate Professor under Career Advancement Scheme (CAS). The panel of experts was drawn and approved (under sealed cover).

(M. Yunus Khalil Ansari)
Professor & Chairman

Copy to:
1. All members of Board of Studies.
2. Dean, Faculty of Life Sciences.
3. Deputy Registrar (Councils).

(M. Yunus Khalil Ansari)
Professor & Chairman
Department of Botany
Ordinary Meeting of B.O.S
Held on 07.06.2016

ALLEOATION OF TEACHING WORK
FOR THE SESSION 2016-2017

B.Sc. (Hons) I Semester

Course – 1: Cell Biology and Basic Biochemistry
Section – I: BTB, BCB, ZYB (Mains)
1. Dr. Qazi Fariduddin
2. Dr. Tariq Aftab
   Lab. – I: BTB, BCB, ZYB (One register)

Section – II: CHB (Mains)
1. Prof. Hisamuddin
2. Prof. Altaf Ahmad
   Lab – I: CHB (One register)

B.Sc. (Hons) II Semester

Course – 3: Diversity and Classification of Plant Kingdom
Section – I: BTB, BCB, ZYB (Mains)

Bryophytes - Prof. Mansoor A. Siddiqui
Fungi - Prof. Zaki Anwar Siddiqui
Angiosperms - Dr. Athar A. Khan
Algae - Dr. Qazi Fariduddin
Pteridophytes - Dr. Anwar Shahzad
Gymnosperms - Dr. Anwar Shahzad
   Lab. - II: BTB, BCB, ZYB (Mains) - One register

Section-II : CHB (Mains)

Fungi - Prof. Mansoor A. Siddiqui
Bryophytes - Prof. Mansoor A. Siddiqui
Angiosperms - Dr. Athar A. Khan
Algae - Dr. Tariq Aftab
Pteridophytes - Dr. Tariq Aftab
Gymnosperms - Dr. Tariq Aftab
   Lab. – II: CHB (Mains) - One register
B.Sc. (Hons) III Semester

Course – 5: Plant Physiology and Ecology
Section – I: BTB, BCB, ZYB (Mains)
   1. Prof. Firoz Mohammad
   2. Dr. Qazi Fariduddin
   3. Dr. Tariq Aftab
   Lab-III: BTB, BCB, ZYB (Mains) - One register

Section – II: CHB (Mains)
   1. Prof. Zaki A. Siddiqui
   2. Prof. Shamsul Hayat
   3. Dr. Tariq Aftab
   Lab – III: CHB (Mains) - One register

Course – 7: Methods of Environmental Analysis (Skill Enhancement Elective 1)
   1. Prof. Fareed A. Khan
   2. Dr. Athar A. Khan

Course – 8: Techniques in Plant Breeding (Skill Enhancement Elective 2)
   1. Prof. Shamsul Hayat
   2. Prof. Fareed A. Khan
   3. Prof. Altaf Ahmad
   4. Dr. Athar A. Khan

B.Sc. (Hons) IV Semester

Course - 9: Diversity of Plants and their Utilization
Section – I: BTB, BCB, ZYB (Mains)
   1. Prof. Zaki A. Siddiqui
   2. Prof. Fareed A. Khan
   3. Dr. Tariq Aftab
   Lab – IV: BTB, BCB, ZYB (Mains) - One register

Section – II: CHB (Mains)
   1. Prof. Fareed A. Khan
   2. Dr. Qazi Fariduddin
   3. Dr. Asim Masood
   Lab – IV: CHB (Mains) - One register
Department of Botany
Ordinary Meeting of B.O.S
Held on 07.06.2016

Course – 11: **Experiments in Cytology and Genetics** (Skill Enhancement Elective 1)
1. Prof. Firoz Mohammad
2. Prof. Nafees A. Khan
3. Dr. Asim Masood

Course – 12: **Study of Plant Diseases and their Management** (Skill Enhancement Elective 2)
1. Prof. Irshad Mahmood
2. Prof. Hisamuddin
3. Prof. Tabreiz A. Khan

Course – 13: **Basic Concepts in Botany** (Open Elective)
1. Dr. Anwar Shahzad
2. Dr. Asim Masood

**B.Sc. (Hons.) V Semester**

Course – V: **Biology of Cryptogams**
1. Prof. Irshad Mahmood
2. Prof. Mansoor A. Siddiqui
3. Prof. Shamsul Hayat
4. Dr. (Mrs.) Shahla Faizan
   
   **Lab – V: Course V** - One register

Course – VI: **Biology of Seed Plants**
1. Prof. Mansoor A. Siddiqui
2. Prof. Abrar A. Khan
3. Dr. (Mrs.) Shahla Faizan
   
   **Lab – VI: Course VI** - One register

Course – VII: **Microbiology and Plant Pathology**
1. Prof. Tabreiz A. Khan
2. Prof. Zaki A. Siddiqui
3. Dr. (Mrs.) Shahla Faizan
   
   **Lab – VII: Course VII** - One register

**B.Sc. (Hons.) VI Semester**

Course – VIII: **Genetics and Plant Breeding**
1. Prof. Altaf Ahmad
2. Dr. Asim Masood
   
   **Lab – VIII: Course VIII** - One register
Course – IX: **Biochemistry, Molecular Biology and Biotechnology**

1. Prof. Nafees A. Khan
2. Prof. Shamsul Hayat
3. Dr. Qazi Fariduddin
4. Dr. (Mrs.) Shahla Faizan

**Lab – IX: Course IX**  - One register

Course – X: **Systematics of Angiosperms and Environmental Botany**

1. Prof. M. B. Siddiqui
2. Dr. Athar A. Khan
3. Dr. (Mrs.) Shahla Faizan

**Lab – X: Course X**  - One register
M. Sc. I Semester

Course – 1: Diversity of Microbes (Viruses, Bacteria, Fungi, Nematodes)
1. Prof. Irshad Mahmood
2. Prof. Hisamuddin
3. Prof. Tabreiz A. Khan

Course – 2: Plant Pathology
1. Prof. Irshad Mahmood
2. Prof. Abrar A. Khan
3. Prof. Hisamuddin
4. Prof. Tabreiz A. Khan

Course – 3: Algae and Bryophytes
1. Prof. Firoz Mohammad
2. Prof. Mansoor A. Siddiqui

Course – 4: Pteridophytes and Gymnosperms
1. Prof. Tabreiz A. Khan
2. Prof. Shamsul Hayat
3. Dr. (Mrs.) Shahla Faizan
4. Dr. Asim Masood

Course – 5: Taxonomy and Angiosperms
1. Prof. M. B. Siddiqui
2. Dr. Athar A. Khan

C-6 Lab – I: Course 1 & 2 (One register)
C-7 Lab – II: Course 3 & 4 (One register)
C-8 Lab – III: Course 5 (One register)

M.Sc. II Semester

Course – 9: Plant Resource Utilization and Conservation
1. Prof. Irshad Mahmood
2. Prof. M. B. Siddiqui
3. Prof. Tabreiz A. Khan

Course – 10: Reproduction in Flowering Plant
1. Prof. Samiullah Khan
2. Dr. Tariq Aftab
Course – 11:  **Plant Development**
1. Prof. Fareed A. Khan
2. Dr. Tariq Aftab

Course – 12:  **Cell and Molecular Biology**
1. Prof. Mohammad Anis
2. Prof. M. Y. K. Ansari
3. Prof. Altaf Ahmad
4. Dr. Anwar Shahzad

Course – 13:  **Plant Physiology & Metabolism**
1. Prof. Firoz Mohammad
2. Prof. Nafees A. Khan
3. Prof. Shamsul Hayat

C-14  Lab – IV: Course 9, 10 & 12  (One register)
C-15  Lab – V: Course 11 & 13  (One register)
C-16  Seminar  (Ability Enhancement Discipline Centric)

**M.Sc. III Semester**

Course – 17:  **Genetics and Cytogenetics**
1. Prof. Mohammad Anis
2. Prof. Samiullah Khan
3. Prof. Altaf Ahmad
4. Dr. Anwar Shahzad

Course – 18:  **Plant Biotechnology**
1. Prof. Mohammad Anis
2. Prof. Hisamuddin
3. Prof. Altaf Ahmad
4. Dr. Anwar Shahzad

Course – 19:  **Environmental Sciences**
1. Prof. M. B. Siddiqui
2. Prof. Abrar A. Khan
3. Dr. (Mrs.) Shahla Faizan
Course – 20: Ecology
1. Prof. Zaki A. Siddiqui
2. Prof. Fareed A. Khan
3. Dr. Athar A. Khan
4. Dr. Qazi Fariduddin

Course – 21: General Botany (CBC)
1. Prof. Mohammad Anis
2. Prof. Zaki A. Siddiqui
3. Dr. Anwar Shahzad
4. Dr. (Mrs.) Shahla Faizan

C-22 Lab - VI: Course 17 & 18 (One register)
C-23 Lab - VII: Course 19 & 20 (One register)
C-24 Seminar (Ability Enhancement Discipline Centric)

M.Sc. IV Semester

Course – 25: Communication Skill / Viva-voce
All teachers involved in respective elective papers (Course 27 & 28)

Course – 26: Field Work
All teachers involved in respective elective papers (Course 27 & 28)

Elective Papers I & II (Specialization)

<table>
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<th>Course – 27 &amp; 28:</th>
<th>Plant Pathology</th>
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<td>Prof. Irshad Mahmood</td>
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<td>Prof. Zaki A. Siddiqui</td>
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Course – 27 & 28:  **Advanced Plant Physiology**
1. Prof. Firoz Mohammad  
2. Prof. Nafees A. Khan  
3. Prof. Shamsul Hayat  
4. Dr. Qazi Fariduddin

**Course – 27 & 28: Cytogenetics and Plant Breeding**
1. Prof. Mohammad Anis  
2. Prof. M. Y. K. Ansari  
3. Dr. Samiullah Khan

**Course – 27 & 28: Environmental Botany**
1. Prof. M.B. Siddiqui  
2. Prof. Abrar A. Khan  
3. Dr. (Mrs.) Shahla Faizan

**Course – 27 & 28: Plant Biotechnology**
1. Prof. Mohammad Anis  
2. Prof. M. Y. K. Ansari  
3. Prof. Samiullah Khan  
4. Prof. Altaf Ahmad  
5. Dr. Anwar Shahzad

Teachers associated with the aforesaid course will also supervise project work.

C-29  **Lab - VIII: Course 27 & 28**

(For all five elective papers separately)
1. Plant Pathology  
2. Advanced Plant Physiology  
3. Cytogenetics and Plant Breeding  
4. Environmental Botany  
5. Plant Biotechnology

**Note:** The CBCS open elective course will be run when a minimum 05 and maximum 30 students are enrolled.
TEACHING ALLOCATON
OF WOMAN’S COLLEGE FOR THE ACADEMIC SESSION 2016-17
(B.Sc. I Year, II Year and III Year)

B.Sc. (Hons) I Semester

Course – 1: Cell Biology and Basic Biochemistry
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. Moinuddin
3. Prof. (Mrs.) Akhtar Inam
4. Prof. (Mrs.) Sheila Shahab
5. Dr. (Mrs.) Kiran Lata Chauhan
6. Dr. (Mrs.) Fauzia Naushin

B.Sc. (Hons) II Semester

Course – 3: Diversity and Classification of the Plant Kingdom
1. Prof. Moinuddin
2. Prof. (Mrs.) Razia K. Zaidi
3. Prof. (Mrs.) Sheila Shahab
4. Dr. (Mrs.) Kiran Lata Chauhan
5. Dr. Mrs.) Fauzia Naushin

Lab-I: Course-I & II (BTB, BCB, ZYB & CHB)

B.Sc. (Hons) III Semester

Course – 5: Plant Physiology and Ecology
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. Moinuddin
3. Prof. (Mrs.) Akhtar Inam
4. Dr. (Mrs.) Kiran Lata Chauhan

Course – 7: Methods of Environmental Analysis (Skill Enhancement Elective 1)
1. Prof. Moinuddin
2. Prof. (Mrs.) Akhtar Inam
3. Dr. (Mrs.) Kiran Lata Chauhan

Course – 8: Techniques in Plant Breeding (Skill Enhancement Elective 2)
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. Moinuddin
3. Dr. (Mrs.) Fauzia Naushin
B.Sc. (Hons) IV Semester

Course – 9: Diversity of Plants and their Utilization
1. Prof. (Mrs.) Razia K. Zaidi
2. Prof. (Mrs.) Sheila Shahab
3. Dr. (Mrs.) Fauzia Naushin

Lab- II: Course-III & IV (BTB, BCB, ZYB & CHB)

Course – 11: Experiments in Cytology and Genetics (Skill Enhancement Elective 1)
1. Prof. (Mrs.) Sheila Shahab
2. Dr. (Mrs.) Kiran Lata Chauhan
3. Dr. (Mrs.) Fauzia Naushin

Course – 12: Study of Plant Diseases and their Management (Skill Enhancement Elective 2)
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. (Mrs.) Razia K. Zaidi
3. Prof. (Mrs.) Sheila Shahab

Course – 13: Basic Concepts in Botany (Open Elective)
1. Prof. (Mrs.) Akhtar Inam
2. Prof. (Mrs.) Razia K. Zaidi
3. Prof. (Mrs.) Sheila Shahab
4. Dr. (Mrs.) Kiran Lata Chauhan
B.Sc. (Hons) V Semester

Course – V: Biology of Cryptogams
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. (Mrs.) Akhtar Inam
3. Prof. (Mrs.) Sheila Shahab
4. Dr. (Mrs.) Kiran Lata Chauhan
5. Dr. (Mrs.) Fauzia Naushin

Lab-V: Course- V

Course – VI: Biology of Seed Plants
1. Prof. (Mrs.) Razia K. Zaidi
2. Prof. (Mrs.) Sheila Shahab

Lab-VI: Course- VI

Course – VII: Microbiology and Plant Pathology
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. (Mrs.) Razia K. Zaidi
3. Prof. (Mrs.) Sheila Shahab

Lab-VII: Course- VII

B.Sc. (Hons) VI Semester

Course – VIII: Genetics and Plant Breeding
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. Moinuddin
3. Dr. (Mrs.) Kiran Lata Chauhan
4. Dr. (Mrs.) Fauzia Naushin

Lab-VIII: Course- VIII

Course – IX: Biochemistry, Molecular Biology and Biotechnology
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. Moinuddin
3. Prof. (Mrs.) Akhtar Inam
4. Dr. (Mrs.) Kiran Lata Chauhan

Lab-IX: Course- IX

Course – X: Systematics of Angiosperms and Environmental Biology
1. Prof. (Mrs.) Ghazala Parveen
2. Prof. Moinuddin
3. Prof. (Mrs.) Akhtar Inam
4. Dr. (Mrs.) Kiran Lata Chauhan

Lab-X: Course- X
B.Sc. III Semester (Skill Enhancement Elective)

Course – 07: Methods of Environmental Analysis Credit: 02

Unit I Techniques in Environmental Analysis: Cell fractionation (homogenization and centrifugation), paper chromatography and spectrophotometry.

Unit II Water Pollution Analysis: Colour, conductivity, temperature, odour, turbidity, hardness, determination of calcium, carbonate, dissolved oxygen and biological oxygen demand.

Unit III Air Pollution Analysis: Analysis of aerosol, sulphur dioxide, hydrogen sulphide and ozone.

Unit IV Soil Pollution: Colour, moisture, temperature, pH, electrical conductivity, determination of magnesium, chloride, biological preparation and inoculation of culture media.
B.Sc. III Semester (Skill Enhancement Elective)

Course – 08: Techniques in Plant Breeding Credit: 02

Unit I  **Hybridization:** Hybridization programme and procedure choice of parents, Evaluation of parents, Emasculation (Hand Emasculation, Suction Method, Hot water Emasculation, Alcohol treatment, Cold treatment), Bagging, Tagging, Pollination, Harvesting of F₁ seeds, Raising the F₂ generation.

Unit II  **Procedure for Mutation Breeding:** Objectives of the programme physical and chemical mutagens, Selection of the variety for Mutagen treatment, parts of the plant to be treated, Doses of the Mutagen, Giving Mutagenic treatment, Handling of the Mutagen – treated population, Gamma Garden.

Unit III  **Polyploidy:** Origin and production of Auto polyploidy – Spontaneous mutation, Physical & chemical agents, Regeneration *in vitro*, Colchicines treatment: Seed treatment, Seedlings, Growing Shoot apices, other chemical agents.

Unit IV  **Field plot techniques in plant Breeding:** Principiles of Experimental Designs - Replication Randomization, Complete Block & Split Plot Designs.
B.Sc. IV Semester (Skill Enhancement Elective)

Course – 11: Experiments in Cytology and Genetics        Credit: 02

Unit I   Chromosome Morphology: To study generalised plant cell, cell division (Meiosis and Mitosis) (polytene chromosomes, Sex chromosomes).

Unit II  Chromosome Methodologies: Prefixation, Fixation, Staining, Preparation of slide for mitotic study, Preparation of slide for meiotic study, Preparation of permanent slide.

Unit III General Schedule for Double Staining Technique: Selection of the Material Tissues, Pre treatment and fixation and fixing chemical (formaldehyde), Section cutting, Double staining, Dehydration and Mounting.

Unit IV  Monohybrid cross, Dihybrid cross, Floral biology and Floral morphology, Intervarietal hybridization in self pollinated cross, Effect of chemical / physical mutagens on seed germination and seedling growth.
B.Sc. IV Semester (Skill Enhancement Elective)

Course – 12: Study of Plant Diseases and Their Management          Credit: 02

Unit- I
A. Plant Viruses – Structure of Viruses, Viral Parasitism and Morphological Symptoms

B. Disease caused by Viruses and their Management:
   a. Yellow Vein Mosaic of Okra
   b. Leaf Roll of Potato

Unit- II
A. Plant Pathogenic Bacteria – Structure of Bacterium, Mode of Infection, Symptoms of Bacterial Diseases

B. Bacterial Diseases of Plant and their Management:
   a. Citrus Canker
   b. Scab of Potato

Unit- III
A. Plant Pathogenic Fungi – Structure of Fungal Cell, Mode of Infection, Symptoms of Fungal Diseases

B. Fungal Diseases of Plant and their Management:
   a. Stripe Rust of Wheat
   b. Early Blight of Potato

Unit- IV
A. Plant Parasitic Nematodes – Structure of Nematode, Mode of Infection, Symptoms Caused by Nematodes

B. Nematodes Diseases of Plant and Their Management:
   a. Root Knot Disease of Tomato
   b. Molya Disease of Wheat
B.Sc. IV Semester (Open Elective Course)

Course – 13: Basic Concept in Botany

Credit: 04

Unit I  Plant Kingdom, Classification; Bentham & Hooker Diagnostic features and economic importance of Solanaceae & Poaceae.

Unit II  Economic importance of cereals (Wheat), oils (Mustard), Pulse (Pea), Fibres (Cotton) and medicinal plants (Opium poppy).

Unit III Characterization of algae bryophyte pteridophytes and Gymnosperms Eukaryotic cell structure, chemical composition or protoplasm, cell wall, plasma membrane, Mendel’s laws of Inheritance.

Unit IV Environmental and Plant Physiology: Pollution (Air, Water, Soil, Noise & Radioactive), elementary concept of photosynthesis respiration.
M.Sc. III Semester

Course – 19: Environmental Sciences
Credit: 02

Unit – I: Environment and Pollution:
(a) Introduction, Brief idea of hydrosphere, lithosphere, biosphere and atmosphere (troposphere, stratosphere, mesosphere, ionosphere and exosphere).

(b) Kinds of pollution, Brief account of air pollution, water pollution, land pollution, thermal pollution and noise pollution.

Unit – II: Environmental Changes:
(a) Global warming, greenhouse gases, consequences of global warming (sea level rise, human health, effect on agriculture and temperature rise).

(b) Ozone depletion (Ozone hole), Chlorofloro carbon cycle, consequences of ozone depletion, Check on global warming.

Unit – III: Natural Resources:
(a) Different types of natural resources: Renewable natural resources and Non-renewable natural resources, Forest resources, Wildlife resources, Water resources.

(b) Food and agriculture resources (Shifting and Sedentary cultivations), Energy resources (Energy plantation, Petro plants).

Unit – IV: Environmental Management:
(a) Control of air pollution, water pollution, soil pollution, noise pollution and thermal pollution.

(b) Enforcement of legal provision in India, wildlife management (conservation of habitats, species preservation, introduction of exotic species).

LABORATORY: Exercises corresponding to the theory courses.
M.Sc. II Semester

Course – 13: Plant Physiology & Metabolism  Credit: 04

Unit-I:  (a) Mineral nutrition: Essential and beneficial elements, Criteria of essentiality, Role of nitrogen and sulphur; Water absorption by roots, Root pressure, Cohesion-Tension theory


Unit-II:  (a) Photosynthesis: Light harvesting complexes of higher plants, light reactions of photosynthesis, photosynthetic carbon reduction pathways. Hatch-Slack pathway

(b) Respiration: Glycolysis, TCA cycle, mitochondrial electron transport and oxidative phosphorylation, Fermentation

Unit-III:  (a) Nitrogen metabolism: Nitrate assimilation, Ammonia assimilation, Biological nitrogen fixation

(b) Lipid metabolism: General account of storage (triacyl glycerol and waxes) and structural (glycerophospholipids and sterols) lipids, fatty acids and triacylglycerol-their structure, synthesis and degradation-alpha and beta oxidation and glyoxylate cycle.

Unit-IV:  (a) Growth regulators: Physiological role and mechanism of action of plant growth hormones (Auxins, Gibberellins, Cytokinins, Ethylene, abscisic acid, Brassinosteroids), hormone receptors and signal transduction.

(b) Sensory photobiology: Photochemical and biochemical properties of phytochromes, cryptochromes and phototropins
REVISED SYLLABUS FOR Ph.D. COURSE WORK PROGRAMME
(One semester starting w.e.f. date of admission)

Course I  Marks - 100

Unit – I:  Research Methodology and Ethics: Preparation of stains, fixatives, stock solutions, MS medium, DNA isolation, Protein analysis/ estimation, soil and water culture, Autoradiography, population dynamics, protoplast isolation and somatic hybridization, synthetic seed technology, genetic transformation methods, techniques of haploid and double haploid production, Immuno techniques. Plagiarism: Etymology and concept, Legal aspects, In academia and journalism, Self plagiarism, Code of ethics.


Unit – III:  Basic Computer application and Statistics.
   I. Micro soft office 2010 (MS word, Excel, Power Point)
   II. Correlations analysis: Positive and negative correlations; Linear and non-linear correlations – by using Sigma plot 12.0
   III. Regression analysis: Meaning, types regressions lines, equations – by using Sigma plot 12.0
   IV. SPSS II (Chicago, USA)
      ● One – way ANOVA
      ● Two – way ANOVA
      ● TMRT (Tuquies Multiple Range Test)
   V. Mean, Median, Mode, t- test, Chi- square test, LSD test.

Unit – IV:  Tools and Equipments, their principles & working: Balances, Compound and light microscope, BOD Incubator, laminar flow, microwave oven, magnetic stirrer, spectrophotometer, Atomic absorption spectrophotometer, Electron microscopy (TEM, SEM), PCR technique, electrophoresis, blotting techniques, chromatography, Autoclave, Centrifuge, Colorimeter, Deionizer, Distillation apparatus, Incubator & Furnace, hot plate, waterbath, microtome, pH meter, Shakers, Plant growth chamber.
Submission of critical and comprehensive review article based on assigned problem to each research scholar, which will be observed for-

   a. Quality of review
   b. Presentation before the committee consisting of- 1. Supervisor, 2. One senior person from the area of research and 3. Chairman.
   c. Viva voce based on review
      With weightage of 50%, 25%, 25% respectively for a, b and c.