



Syllabus

For B.Sc 2nd Semester Courses in

Botany

(June 2020 onwards)

- Contents:
- Theory Syllabus for Courses:
 - SBOT0201 – Plant Physiology
 - SBOT0202 – Cytology and Ecology

- Practical Course Syllabus for: SBOT02PR
- Evaluation and Assessment guidelines.

F.Y. B.Sc. Botany

Course code: SBOT0201

Course Title: PLANT PHYSIOLOGY

Learning Objectives:

1. To understand the transport mechanism in plants and its physiological process.
2. To learn and understand the mechanism of enzyme actions.
3. To know the major classes of organic compounds, their synthesis and breakdown.

Number of lectures: 45

Unit 1

(15 lectures)

Water Relations

Water: plant constituent, functions, molecular structure, physical and chemical properties. Imbibition and osmosis, water potential and its components, role of turgor pressure in plant cells, Transpiration: Water loss by transpiration, measurements of transpiration rates, plant anti-transpirants, stomatal movements, movement of water across roots and through leaves.

Unit 2

(15 lectures)

Transport Processes

Transport processes: movement of solutes in plants, passive transport, protoplasmic membrane, active transport across membranes and its mechanism, shuttle systems, electroosmosis and pinocytosis, transcellular transport. Anatomy of sieve tubes, mechanism of sieve tube translocation.

Unit 3

(15 lectures)

Plant Biochemistry

Enzymes: nomenclature, properties, classification, specificity, apoenzyme, prosthetic group, mode of action, kinetics (no derivation), enzyme inhibition, isozymes. Major cellular compounds: carbohydrates, lipids and proteins, their classification and functions in plants; biosynthesis and degradation of Fats.

List of Recommended Reference Books

1. Noggle, Ray G.;Fritz, George J.; Introductory plant physiology; 2nd edition; New Delhi : Prentice-Hall Of India Private Limited , 1991.
2. Sinha, B.K.;Pandey, S.N.; Plant Physiology; 1st edition; New Delhi : Vikas Publishing House Pvt. Ltd. , 1981.
3. Salisbury, Frank B.;Ross, Cleon W.; Plant physiology; 3rd edition, Reprint; New Delhi : CBS Publishers & Distributors , 1986(2001).
4. Devlin, Robert M.;Witham, Francis H.; Plant Physiology; 4th edition, Indian reprint; Delhi : CBS Publishers & Distributors , 1986(2001).
5. Kochhar, P.L.; A textbook of Plant Physiology; 7th edition; Delhi :Atma Ram & Sons , 1964.
6. Verma S. K. Textbook of Plant physiology and Biochemistry ; 4th editon; S. Chand & Company Ltd, 2003

Practical: SBOTPR0201

- I) Study of activity of amylase.
- II) Determination of solute potential by plasmolytic method.
- III) To demonstrate ascent of sap using a dye.
- IV) Determination of stomatal index.
- V) Qualitative analysis for detection of carbohydrates.
- VI) Tests for detection of proteins and amino acids.

F.Y. B.Sc. Botany

Course code: SBOT0202

Course Title: CYTOLOGY AND ECOLOGY

Learning Objectives:

To understand the structure and functions of various cell organelles.

To learn and understand the phenomenon of inheritance.

To recognize the interactions taking place in the ecosystem and flow of Energy.

Number of lectures: 45

Unit 1

(15 lectures)

Cytology:

Ultra-structure and functions of the following: Cell wall, plasma membrane (unit membrane and fluid mosaic model), mitochondrion, chloroplast. Nucleus: chromosomes, mitosis.

Unit 2

(15 lectures)

Genetics:

Mendel's laws, allelic and non-allelic interaction, epistatic interactions, sex determination in plants.

Unit 3

(15 lectures)

Ecology:

Concept of ecosystem: components and their interactions, food chains and food web; ecological pyramids; ecological adaptations of plants belonging to following ecological groups: hydrophytes, xerophytes and halophytes.

List of Recommended Reference Books

1. Gupta, P.K.; Genetics : A textbook for University students; 3rd edition; Meerut : Rastogi Publications, 2007.
 2. Gardner, Eldon J.; Snustad, Peter D.; Principles of genetics; 7th edition; New York : John Wiley & Sons , 1984.
 3. De Robertis, E.D.P.; Nowinski, Wiktor W.; Saez, Francisco A.; Cell Biology; Philadelphia : W.B. Saunders Company , 1970.
 4. Powar, C.B.; Daginawala, H.F.; General microbiology; vol.I-II; 2nd edition, reprint; Bombay : Himalaya Publishing House , 1986(1993)
 5. Subrahmanyam, N.S.; Sambamurty, A.V.S.S.; Ecology; 1st edition; New Delhi : Narosa Publishing House , 2000.
 6. Sharma, P.D.; Ecology and Environment; 7th edition; Meerut: Rastogi Publishers, 1998.
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Practical: SBOTPR0202

- I) Examining various stages of mitosis in root tip cells.
- II) Study of external and internal structures of *Hydrilla*, *Nymphaea*, *Nerium*, *Opuntia* and *Avicennia*.
- III) Study of pond, terrestrial and estuarine ecosystem.
- IV) Problems on mendelian genetics- mono hybrid and dihybrid ratios, allelic and non-allelic interactions, epistatic interactions

Evaluation and Assessment: SBOT0201 and SBOT0202 courses

Evaluation (Theory): Total marks per course - 100.

CIA- 40 marks

CIA 1: Written test -20 marks

CIA 2: Written Test / Assignment / Field Trip & Report -20 marks

End Semester Examination – 60 marks

One question from each unit for 20 marks, with internal choice. Total marks per question with choice -28 to 30.

Evaluation of SBOT2PR (Practical) Total marks per Practical course - 100.

End Semester Practical Examination – (SBOTPR0201- 50 marks and SBOTPR0202- 50 marks)

Template for SBOT0201 Course End Semester Examination in Semester 2

| UNITS | KNOWLEDGE | UNDERSTANDING | APPLICATION and ANALYSES | TOTAL MARKS- Per unit |
|-----------------------------------|------------------|----------------------|---|--------------------------------------|
| 1 | 10 | 06 | 04 | 20 |
| 2 | 10 | 06 | 04 | 20 |
| 3 | 10 | 06 | 04 | 20 |
| -TOTAL - Per objective | 30 | 18 | 12 | 60 |
| % WEIGHTAGE | 50 | 30 | 20 | 100% |

Template for SBOT0202 Course End Semester Examination in Semester 2

| UNITS | KNOWLEDGE | UNDERSTANDING | APPLICATION and ANALYSES | TOTAL MARKS- Per unit |
|-----------------------------------|------------------|----------------------|---|--------------------------------------|
| 1 | 10 | 05 | 05 | 20 |
| 2 | 10 | 05 | 05 | 20 |
| 3 | 10 | 05 | 05 | 20 |
| -TOTAL - Per objective | 30 | 15 | 15 | 60 |
| % WEIGHTAGE | 50 | 25 | 25 | 100% |

St. Xavier's College, Mumbai.
ASSESSMENT OF WRITTEN ASSIGNMENT- TYPE - I

Dept. of Botany; Course Code _____ Date _____ Roll No _____

Name of student: _____ UIDNo _____ Marks _____ / 20

Title of Assignment: _____

Assessment Grid : Place one tick in each appropriate row. Overall mark should reflect the positions of ticks in the individual rows. In boxes that have more than one set of marks, cancel out the marks that are not applicable and circle the correct marks.

Assessment of Written Assignment: 20 Marks

| 100% | ASSIGNMENT | 80-100% (17-20 Marks) | 60-80% (13-16 Marks) | 40- 60% (9-12 Marks) | 20-40% (5-8 Marks) | 0-20% (0-4 Marks) |
|------|---|--|---|--|---|--|
| 60 % | Content Impression of wide reading (research), good knowledge and comprehensive understanding. Evidence of thoughtful input. Ability to critique, Bibliography mentioned ----- Marks ----- | Excellent 12 / 11 / 10 | Good 9 / 8 | Satisfactory 7 / 6 | Poor 5 / 4 | Very Poor 3 / 2 / 1 |
| 30 % | Organization Effective presentation, logical format, clear statement of ideas, relevant details, sequence of information and ideas could be easily followed, references / footnotes / endnotes ----- Marks ----- | Effective organization 6 | Few problems 5 | Many problems 4 | Inadequate presentation. Ineffective format, communication of ideas, lack of relevant details – but an attempt 3 | No attempt to organize 2 |
| 5% | Vocabulary ----- Marks ----- | Richness of vocabulary 1 | Very good range of vocabulary with some errors 1 | Good range of vocabulary with some errors 0.5 | Small range of vocabulary with errors 0.5 | Little of no effort to demonstrate vocabulary knowledge 0 |
| 5% | Grammar, spellings, mechanics ----- Marks ----- | Grammar, spellings punctuations correct 1 | Very few errors 1 | Some errors 0.5 | Many errors 0.5 | No effort 0 |

Comments:

Name and Signature of Faculty _____.

St. Xavier's College, Mumbai.
ASSESSMENT OF WRITTEN ASSIGNMENT- TYPE - II

Dept. of Botany; Course Code _____ Date _____ Roll No _____

Name of student: _____ UIDNo _____ Marks _____ / 20

Title of Assignment: _____

Assessment Grid : Place one tick in each appropriate row. Overall mark should reflect the positions of ticks in the individual rows. In boxes that have more than one set of marks, cancel out the marks that are not applicable and circle the correct marks.

Assessment of Written Assignment: 20 Marks

| 100% | ASSIGNMENT | 80-100% (17-20 Marks) | 60-80% (13-16 Marks) | 40- 60% (9-12 Marks) | 20-40% (5-8 Marks) | 0-20% (0-4 Marks) |
|------|---|--|---|--|---|--|
| 50 % | Content Impression of wide reading (research), good knowledge and comprehensive understanding. Evidence of thoughtful input. Ability to critique, Bibliography mentioned ----- Marks ----- | Excellent 10 / 9 | Good 8 / 7 | Satisfactory 6 / 5 | Poor 4 / 3 | Very Poor 2 / 1 |
| 30 % | Organization Effective presentation, logical format, clear statement of ideas, relevant details, sequence of information and ideas could be easily followed, references / footnotes / endnotes ----- Marks ----- | Effective organization 6 / 5 | Few problems 4 | Many problems 3 | Inadequate presentation. Ineffective format, communication of ideas, lack of relevant details – but an attempt 2 | No attempt to organize 1 |
| 10% | Vocabulary ----- Marks ----- | Richness of vocabulary 2 | Very good range of vocabulary with some errors 1.5 | Good range of vocabulary with some errors 1 | Small range of vocabulary with errors 1 | Little of no effort to demonstrate vocabulary knowledge 0.5 |
| 10% | Grammar, spellings, mechanics ----- Marks ----- | Grammar, spellings punctuations correct 2 | Very few errors 1.5 | Some errors 1 | Many errors 1 | No effort 0.5 |

Comments:

Name and Signature of Faculty _____.

St. Xavier's College, Mumbai.

ASSESSMENT OF WRITTEN ASSIGNMENT

Dept. of _____ Course Code _____ Date _____

UIDNo _____ Roll No _____ Marks _____/20

Name of student: _____

Title of Assignment: _____

Assessment Grid : Place one tick in each appropriate row. Overall mark should reflect the positions of ticks in the individual rows. In boxes that have more than one set of marks, cancel out the marks that are not applicable and circle the correct marks.

| REPORT (Parameters) | Marks | 80 – 100% Excellent | 60 -80% Good | 40 – 60% Satisfactory | 20 – 40% Poor | 0 – 20% Very Poor |
|--|--------------|--------------------------------|-------------------------|----------------------------------|--------------------------|----------------------------------|
| Reference Papers reviewed | 10 | 10 / 9 | 8 / 7 | 6 / 5 | 4 / 3 | 3 / 2 |
| Any other parameters based on which evaluation is done | 10 | 10 / 9 | 8 / 7 | 6 / 5 | 4 / 3 | 3 / 2 |

Comments:

Name of the Faculty _____.

Signature of the Faculty _____

St. Xavier's College, Mumbai.
ASSESSMENT OF BOTANY FIELD TRIP REPORT

Dept. of Botany; Course Code _____ Date _____ Roll No _____

Name of student: _____ UIDNo _____ Marks _____ / 20

Place of visit _____

Assessment Grid : Place one tick in each appropriate row. Overall mark should reflect the positions of ticks in the individual rows

| (20) | Field Trip and Report | 80-100% 17-20 Marks | 60-80% 13-16 Marks | 40-60% 09-12 Marks | 20-40% 05-08 Marks | 0-20% 0-04 Marks |
|-----------------|--|--|--|--|---|-------------------------------------|
| 30% (06) | Organization of report ----Marks---- | Introduction about the location, vegetation, Botanical Names, Family, Local name, Description using Botanical Term, reporting all the species seen, Handwritten or typed. 6 | Few mistakes, few species missing from the report 5 | Many mistakes 4 | Inadequate presentation, ineffective format, lack or relevant detail, but an attempt 3 | No attempt to organize 2 |
| 50% (10) | Content ----Marks---- | Excellent reporting of all the species observed in the field, ecological and morphological data, 10 / 9 | Good reporting, species observed in the field but few of them missing in the list 8 | Satisfactory, many species or relevant data missing from the report 6 | Poor, inadequate and insufficient data or just a list of the species without any data. 5 | Very poor, no data 4 / 3 |
| 10% (02) | Conclusion ----Marks---- | Excellent conclusion based on self observation. Type of forest and vegetation 2 | Good conclusion, comments not independent 2 / 1 | Satisfactory, but insufficient 1 / 0.5 | Poor, irrelevant conclusion 0.5 | Very poor, no conclusion 0.5 |
| 5% (01) | References ----Marks---- | Proper references, in required format 1 | Proper references but no format 1 | Few references 0.5 | Irrelevant references 0 | No references 0 |
| 5% (01) | Attendance / participation ----Marks---- | Attended and participated actively 1 | Attended and participated 1 | Infrequent Participation 0.5 | No participation 0 | Absent 0 |

Comments:

Name and Signature of Faculty _____