# The Kelkar Education Trust's

# V. G. Vaze College of Arts, Science and Commerce

## (Autonomous)

## Syllabus for F. Y. B. Sc

## (June 2020 Onwards)

## Program: B.Sc.

## Semester II

## Course Title: BOTANY

| Course Code | Paper Title | Credit |
|---|---|---|
| SBO201 | PLANT DIVERSITY I | 2.0 |
| SBO202 | FORM AND FUNCTION I | 2.0 |
| SBOP201 | PRACTICALS (201 &202) | 2.0 |

1. Syllabus as per Choice Based Credit System

| | | | |
|---|---|---|---|
| i. | Name oftheProgramme | : | BOTANY |
| ii. | Course Code | : | SBO201 |
| iii. | CourseTitle | : | PLANT DIVERSITY-I |
| iv. | Semester-wiseCourseContents | : | Copy of the syllabus enclosed |
| v. | References andAdditional References | : | Enclosed in the syllabus |
| vi. | CreditStructure | | |
| | No. of Creditsper Semester | : | 02 + 01 = 03 |
| vii. | No. of lecturesperUnit | : | 15 |
| viii. | No. of lectures per week | : | 03 |
| ix. | No. of practical per week | : | 02 (per batch) |
| 2. | Scheme of Examination | : | 60 Marks External assessment<br>40 Marks Internal Assessment |
| 3. | Special notes, if any | : | No |
| 4. | Eligibility, if any | : | As laid down in the college Admission brochure / website |
| 5. | Fee structure | : | As per College fee structure specifications |
| 6. | Special ordinances / Resolutions, if any | : | No |

**Programme:** FYBSc **Semester**: II

**Course:** Plant Diversity I **Course code**: SBO201

| Teaching Scheme (Hrs/Week) | | | | Continuous Internal Assessment (CIA) 40 marks | | | | | End Semester Examination | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **C** | **CIA-1** | **CIA-2** | **CIA-3** | **CIA-4** | **Lab** | **Written** | |
| 3 | - | 1 | 2 | 20 | 15 | 05 | | - | 60 | 100 |
| **Max. Time, End Semester Exam (Theory) -2Hrs.** | | | | | | | | | | |

| **Course Objectives** |
|---|
| To understand the classification and life cycle of Pteridophytes andGymnosperms. |
| To recognize the morphology, structure and functions of various partsof flowers, |

| COURSE CONTENT | | | |
|---|---|---|---|
| **Unit No.** | **Module no.** | **Content** | **Lectures** |
| | | **Paper I: Plant Diversity I** | |
| **1** | | **PTERIDOPHYTES** | **15** |
| | I | Classification of PteridophytaUpto Classes as per G.M. Smith Structure life cycle, systematic position and alternation of generations in *Nephrolepis* | |
| | II | Types of stele in Pteridophyta. | |
| **2** | | **GYMNOSPERMS** | **15** |
| | I | **Classification of Gymnosperms upto classes** (Chamberlain's system of classification) | |
| | II | ***Cycas* :** systematic position, Structure, life cycle and alternation of generations | |
| | III | **Economic importance of Cycadophyta** | |
| **3** | | **ANGIOSPERMS** | **15** |
| | I | Morphology of flower – All Parts of Flower | |
| | II | Inflorescence: Racemose: simple raceme, spike, catkin, spadix, panicle. Cymose: monochasial, dichasial, polychasial. Compound: corymb, umbel, cyathium, capitulum, verticellaster, hypanthodium. | |
| | III | Study of following families:<br>• Malvaceae<br>• Caesalpinoideae<br>• Apocynaceae<br>• Amaryllidaceae | |

| Course outcome |
|---|
| After the completion of the course, students will able to |
| **CO1** To understand the salient features and economic importance of Pteridophytes and Gymnosperms, their life cycle pattern with a suitable example |
| **CO2** Identify morphology of different flower parts and identification of four families of flowering plants based on characteristics learned. |

**Recommended Resources**

**Text Books**

1. Golatkar V.V., Patel B.B., Tutakne N.S. A New Course in Botany, FYBSc, Semester I & II, Sheth Publications, Mumbai.
2. Botany-I, Plant Diversity II, F.Y.B.Sc., Semester II.Tech-Max Publications, Pune.

**Reference Books**

1. Rashid, A. (1978) - An introduction otPeridophytes
2. Vashishta, B.R. (1996) - Botany for degree students – Pteridophytes
3. Parihar, N.S. (1959) - An Introduction to Pteridophyta
4. Chamberlein, C.J. (1966) - Gymnosperms, Structure and Evolution
5. Ramanujan, C.G.K. (1979) - Indian Gymnosperms in Time and Space
6. Vashistha, P.C. (1976) - The Gymnosperms
7. Bhatnagar, S.P. and Moitra Alok (1996)- The Gymnosperms.
8. Pandey and Misra Taxonomy of Angiosperms, Ane's Student Edition
9. Gurcharan Singh. 2004. Plant Systematics : Theory and practice Oxford and YBH Publishing Co. Pvt. Ltd., New Delhi.
10. Lawrence George H. M. 1951. Taxonomy of vascular plants. Oxford and IBH Publ. Co. Pvt. Ltd., New Delhi
11. Naik, V. N. 1984. Taxonomy of Angiosperms Tata McGrow-Hill Publication Com. Ltd., New Delhi.

1. Syllabus as per Choice Based Credit System

| | | | |
|---|---|---|---|
| i. | Name oftheProgramme | : | BOTANY |
| ii. | Course Code | : | SBO202 |
| iii. | CourseTitle | : | FORM AND FUNCTION-I |
| iv. | Semester-wiseCourseContents | : | Copy of the syllabus enclosed |
| v. | References andAdditionalReferences | : | Enclosed in the syllabus |
| vi. | CreditStructure | | |
| | No. of Creditsper Semester | : | 02 + 01 = 03 |
| vii. | No. of lecturesperUnit | : | 15 |
| viii. | No. of lecturesperweek | : | 03 |
| ix. | No. of practicalperweek | : | 02 (perbatch) |
| 2. | SchemeofExamination | : | 60 Marks External assessment<br>40 Marks Internal Assessment |
| 3. | Special notes, if any | : | No |
| 4. | Eligibility, if any | : | As laid down in the college Admission brochure / website |
| 5. | Fee structure | : | As per College fee structure specifications |
| 6. | Special ordinances / Resolutions, if any | : | No |

The Kelkar Education Trust's

# V G Vaze College of Arts, Science and Commerce

## (Autonomous)

**Programmme:**F.Y.B.Sc. **Semester**:II

**Course:** FORM AND FUNCTION I **Course code**: SBO 202

| Teaching Scheme (Hrs/Week) | | | | Continuous Internal Assessment (CIA) 40 marks | | | | | End Semester Examination | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **C** | **CIA-1** | **CIA-2** | **CIA-3** | **CIA-4** | **Lab** | **Written** | |
| 2 | - | 1 | 3 | 20 | 15 | 05 | | - | 60 | 100 |
| **Max. Time, End Semester Exam (Theory) -2Hrs.** | | | | | | | | | | |

| **Course Objectives** |
|---|
| To understand the structure and functions of different plant tissues, types of vascular bundles and anatomical structure and functions of varioustissues |
| To understand the importance of photosynthesis and its role in the process of light and dark reactions ofphotosynthesis |
| To understand the importance of different secondary metabolites. The application of different drugs from grandmas pouch as a source of medicines in curing various diseases |

| COURSE CONTENT | | | |
|---|---|---|---|
| **Unit No.** | **Module no.** | **Content** | **Lectures** |
| | | **Paper II-Course 4**<br>**Form and Function II** | |
| **1** | | **ANATOMY** | **15** |
| | I | Simple tissues, complex tissues | |
| | II | Primary structure of dicot and monocot root, stem. | |
| | III | Epidermal tissue system: types of hair, monocot and dicot stomata | |
| | IV | Types of Vascular Bundles | |
| **2** | | **PHYSIOLOGY** | **15** |
| | I | Photosynthesis: Light reactions, Photolysis of water,<br>Photophosphorylation (cyclic and non-cyclic), | |
| | II | Carbon fixation phase (C3, C4 and CAM pathways) | |
| | III | Photorespiration | |
| **3** | | **MEDICINAL BOTANY** | **15** |
| | I | Concept of primary and secondary metabolites, difference between primary and secondarymetabolites. | |
| | II | **Plants of Grandma's pouch**: Following plants have to be studied with respect to botanical source,partoftheplantused,activeconstituentspresentandmedicinal uses:<br>• *Ocimum sanctum* (Tulsi),<br>• *Adhatoda vasica* (Adulsa),<br>• *Zingiber officinale*(Ginger),<br>• *Curcuma longa* (Haldi),<br>• *Santalum album* (Chandan),<br>• *Aloe vera*. | |

| Course outcome |
|---|
| After the completion of the course, students will able to |
| **CO1** UnderstandAnatomical differences between dicots andmonocots |
| **CO2** Mechanism of light reactions of photosynthesis, Diversity of $CO_2$ fixation in plants as peradaptations |
| **CO3** Identification of medicinal plants and their application in various ailments and disaeases |

| Recommended Resources | |
|---|---|
| **Text Books** | 1. Golatkar V.V., Patel B.B., Tutakne N.S. A New Course in Botany, FYBSc, Semester I & II, Sheth Publications, Mumbai.<br>2. Botany-I, Plant Diversity, F.Y.B.Sc., Semester I.Tech-Max Publications, Pune. |
| **Reference Books** | 1. ACutter, E G 1971 Plant Anatomy<br>2. Emmes, E J. and M C Danials, 1947: An introduction to plant anatomy.<br>3. Easau, K. 1962: Plant anatomy –anatomy of seed plants.<br>4. Fahn, A.1969: Secretary Tissue system<br>5. Foster, A S 1942: Practical plant anatomy<br>6. Masueth, J D. 1936 : Plant anatomy<br>7. Metcalfe, C R and L Chalk, 1950: Anatomy of the dicotyledons<br>8. Noggle, G.R. and Fritz, G. J. (1976): Introductory Plant Physiology<br>9. Salisbury, F. B. and Ross, C.W.(1992): Plant Physiology IV ed.<br>10. Taiz, L. and Ziegler, F. (1998): The Plant Physiolog<br>11. Govindjee, H. (1982): Photosynthesis Vol. I & II.<br>12. Hopkins, W. C. (1995): Introduction to Plant Physiology. |

| Practical I PLANT DIVERSITY I | SBOP201 |
|---|---|
| **Sr. No.** | **Description** |
| **1.** | i. Study of stages in the life cycle of *Nephrolepis*: Mounting of ramentum, hydathode, Sporangium.<br>ii. T.S. of rachis.<br>iii. T.S. of pinna of *Nephrolepis* passing through sorus. |
| **2.** | Stelar evolution with the help of permanent slides:<br>Protostele:haplostele, actinostele, plectostele, mixed protostele,<br>siphonostele: ectophloic, amphiphloic, dictyostele, eustele andatactostele |
| **3.** | Study of stages in the lifecycle of *Cycas:*<br>i. T.S of leaflet (*Cycas* pinna),<br>ii. Megasporophyll, Microsporophyll, coralloid root, microspore, L.S. of ovule of *Cycas* – all specimens to be shown. |
| **4.** | Economic importance of Cycadophyta: *Cycas, Zamia, Macrozamia* |
| **5.** | **Leaf morphology:**<br>i. Leaf: simple leaf and types<br>ii. Types of compound leaves,<br>iii. Incisions of leaf<br>iv. Leaf venation<br>v. Phyllotaxy<br>vi. Types of stipules<br>vii. Leaf apex<br>viii. Leaf margin<br>ix. Leaf shapes. |
| **6.** | Types of inflorescence: as per theory |
| **7.** | Flower Morphology : As per theory |
| **8.** | Study of Angiosperm families :<br>i. Malvaceae<br>ii. Caesalpinaceae<br>iii. Apocynaceae<br>iv. Amaryllidaceae |

| | Practical II (FORM AND FUNCTION I) SBOP201 |
|---|---|
| **Sr. No.** | **Description** |
| **1** | Primary structure of dicot and monocot root. |
| **2** | Primary structure of dicot and monocot stem. |
| **3** | Types of Vascular bundles with the help of permanent slides or photomicrographs |
| **4** | Study of dicot and monocot stomata |
| **5** | Epidermal outgrowths: with the help of mountings<br>i. Unicellular:*Gossypium*(Cotton) /Radish<br>ii. Multicellular: *Lantana*/Sunflower<br>iii. Glandular: *Drosera*and Stinging: *Urtica*– only identification with the help of permanent slides.<br>*iv*. Peltate: *Thespesia*<br>*v*. Stellate: *Erythrina*/*Sida*/*Solanum*/*Helecteris*<br>**vi.** T-shaped: *Avicennia* |
| **6** | Separation of chlorophyll pigments by strip paper chromatography. |
| **7** | Separation of amino acids by paper chromatography. |
| **8** | Change in color because of change in pH: Anthocyanin: black grapes/Purplecabbage |
| **9** | Test for tannins: tea powder/catechu. |
| **10** | Identification of plants or plant parts for grandma's pouch as per theory. |

Dr. Aparna Saraf
(VC Nominee)

| Syllabus Prepared by: |
|---|
| 1. Dr. M. A. Deodhar: Chairperson, Syllabus Committee<br>Head, Dept of Botany,<br>V G Vaze College,<br>Mulund East,<br>Mumbai |
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