Solapur University, Solapur

Faculty of Science

B.Sc.Part- II

General Structure as per

Credit and Grading System

(June, 2015)

Solapur University, Solapur

Faculty of Science

Credit and Grading System

(W.e.f. June, 2015)

- **Title of the Course:**B.Sc.- Part II
- **Subject :** ____Botany_____
- **The Credit and Grading System :**
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With the view to ensure worldwide recognition, acceptability, horizontal as well as vertical mobility for students completing under graduate degree,Solapur University has implemented Credit and grading system of Evaluation at Undergraduate level.

Credit is a numerical value that indicates student's work load (Lectures, Lab work, Seminars, Tutorials, Field work, etc.) to complete a course unit. In most of the universities 15 contact hours constitute one credit. The contact hours are transformed into Credits. As per present norms, there are 4 contact hours per paper (subject) per week which works out to be 60 contact hours per paper (subject) per semester.

In Solapur University, for B. Sc.-II, there are 3 optional subjects and Environmental Studies. For B. Sc.-II, there are 6 contact hours per paper (subject) per week for each optional subject. Therefore, total contact hours per week are 18. Each subject has 90 contact hours, which are transformed into 6credits. As there are 4 contact hours per week forEnvironmental Studies, 4 credits shall be assigned forEnvironmental Studies.

Moreover, the grading system of evaluation is introduced for B. Sc. course, wherein process of Continuous Internal Evaluation is ensured. The candidate has to appear for Internal Evaluation of 30 marks and University Evaluation for 70 marks. It is 70 + 30 pattern of evaluation. It is applicable for theory and practical as well. The details regarding this evaluation system are as under.

- **Conversion of marks into Grades :**

A table for the conversion of the marks obtained by a student in each paper (out of 100) to grade and grade points is given below.

Sr. No	Range of Marks	Grade	Grade Point
1.	80-100	O	10
2.	70-79	A+	9
3.	60-69	A	8
4.	55-59	B+	7
5.	50-54	B	6
6.	45-49	C+	5
7.	40-44	C	4
8.	<39	FC	0 (Failed in Term Exam)
9.	<39	FR	0 (Failed in Internal Assesment)

1. **Grade Point Average at the end of the Semester (SGPA**)

$(G_1xC_1)+ (G_2xC_2)$ +……

$$SGPA = \frac{\Sigma Ci}{\text{---------- }}$$

(ΣCi- The total number of credits offered by the student during a semester)

2. Cumulative Grade Point Average (CGPA)

$$CGPA = \frac{(G_1xC_1)+ (G_2xC_2) +\ldots\ldots}{\Sigma Ci}$$

Σ Ci - the total number of credits offered by the student upto and including the semester for which CGPA is calculated.)

3. **Final Grade Point Average (FGPA)** will be calculated in the similar manner for the total number of credits offered for completion of the said course.

Where: Ci: Credits allocated for the ith course

Gi: Grade point scored in ithpaper (Subject)

4. Conversion of average grade points into grades:

SGPA/CGPA/FGPA	Letter Grade
9.5 - 10	O
8.5 -9.49	A+
7.5 – 8. 49	A
6.5 – 7.49	B+
5.5 – 6. 49	B
4.5 – 5. 49	C+
4.0 – 4. 49	C
< 3.99	FC /F
	FR

Solapur University, Solapur
Faculty of Science
Credit System Structure for B.Sc.II Semester III

Class	Sem	Subject	No. of Papers/ practicals	Hrs/Week			Paper Marks	UA	CA	Credits	Total credits
				L	T	P					
B.Sc.II	III										
		Subject 1	Paper III	3	-	-	100	70	30	3	
			Paper IV	3			100	70	30	3	6
		Subject 2	Paper III	3	-	-	100	70	30	3	
			Paper IV	3			100	70	30	3	6
		Subject 3	Paper III	3	-	-	100	70	30	3	
			Paper IV	3			100	70	30	3	6
Total				18			600			18	18
Grand Total				**18**			**600**			**18**	**18**

Abbreviations: L: lectures, T: Tutorials, P: Practicals; UA: University Assessment by End Semester Examination; CA: College assessment by Internal Continuous Examination

UA (University Assessment): University Theory paper shall be of 70 marks for 3.0hrs duration

CA (College Assessment): The internal examination for Theory and Practical course.

Solapur University, Solapur
Faculty of Science
Credit SystemStructureforB.Sc.II Semester IV

Class	Sem	Subject	No. of Papers/ practicals	Hrs/Week			Paper Marks			Practical			Credits
				L	T	P		UA	CA	Marks	UA	CA	
B.Sc. II	IV	Environmental Studies	(compulsory)	4	-	-	100	70	30				4
		Subject 1	Paper V	3	-	-	100	70	30				3
			PaperVI	3			100	70	30				3
		Subject 2	Paper V	3	-	-	100	70	30				3
			PaperVI	3			100	70	30				3
		Subject 3	Paper V	3	-	-	100	70	30				3
			PaperVI	3			100	70	30				3
Total Theory				**22**			**700**						**22**
		Practical 1		-	-	8				200	140	60	4
		Practical 2		-	-	8				200	140	60	4
		Practical 3		-	-	8				200	140	60	4
TotalPract.						**24**				**600**			**12**
Grand Total										**1300**			**34 18**
B.Sc. Part II										**1900**			**52**

Abbreviations: L: lectures, T: Tutorials, P: Practicals; UA: University Assessment by End Semester Examination; CA: College assessment by Internal Continuous Examination

UA (University Assessment): University Theory paper shall be of 70 marks for 3.0hrs duration

CA (College Assessment): The internal examination for theory and Practical course.

General Guidelines for Credit and Grading System
B.Sc.II

1. The University follows Semester system
2. An academic year shall consist of two semesters
3. Each B.Sc. course shall consist of three years i.e. six semesters
4. Environmental Studies paper shall remain compulsory for B.Sc.Part- II students inIV^{th} Sem.
4. B.Sc.Part-II shall consist of two semesters: Semester III and Semester IV.

In semester –III, there will be two theory papers of 100 marks for each subject. There shall be three optional science subjects. Similarly, in semester –IV there will be two theory papers of 100 marks for each subject. There shall be three optional science subjects and Environmental Studiespapercompulsory for every student in semester IV.

The scheme of evaluation of performance of candidates shall be based on University assessment as well as College internal assessment as given below.ForB.Sc.PartII SemIII&IV the internal assessment will be based on Unit tests, Home assignment,viva,practicals, Project Worketc as givenbelow.Practical course examination of 200 marks for each subject shall be conducted at the end of IV^{th}semester. The practical examination of 200 marks shall also consist of 140 marks for University practical assessment and 60 marks for college internal assessment.

The process of evaluation for Environmental Studies shall be based on University theory examination of 70 marks and 30 marks internal assessment. The internal assessment for environmental studies shall be based on internal test/ home assignment/tutorial of 10 marks and project work for 20 marks.

For University practical examination out of two examiners, one examiner will be internal and another examiner will be External. Both examiners will be appointed by the University. The internal practical assessment shall be done as per scheme given below.

5. **Scheme of evaluation:**

As per the norms of the grading system of evaluation, out of 100 Marks, the candidate has toappear for College internal assessment of 30 marks and external evaluation (University Assessment) of 70 marks.The respective B.O.S. may decide the nature of College internal Assessment after referring to the scheme given below or may be used as it is.

Semester -III:

Theory : (100 marks)

University Examination (70 Marks): No. of Theory papers: 2 Papers/Subject (Total 6 Papers)

Internal Continuous Assessment (30 Marks):

Scheme of Marking: 20 Marks: Internal Test

10 Marks: Home assignment/Tutorials/Seminars/ Group discussion/ Viva/Field visit/Industry visit.

Semester -IV:(100 marks)

Theory:

University Examination (70 Marks): No of Theory papers: 2 Papers/Subject (Total 6+1Papers)

Internal Continuous Assessment (30 Marks):

Scheme of Marking: 20 Marks: Internal Test

10 Marks: Home assignment/Tutorials/ Seminars/ Group discussion/ Viva/ Field visit/Industry visit.

Practical Examination:

University Examination (140 Marks**)**: No of Practicals: 1 Practical /Subject (Total 3Practicals)

Internal Continuous Assessment (60 Marks):

Scheme of Marking: 40 Marks: Internal Test on any fourpracticals, 20 Marks: Lab Journal/viva, attendance, attitudeetc.
For Environmental Studies there shall be theory examination of 70 marks (UA) and 30 marks (CA) internal assessment. The internal assessment for environmental studies shall be based on internal test/ home assignment/tutorial of 10 marks and project work and report of 20 marks.

6.**Passing Standard**

The student has to secure a minimum of 4.0 grade points (Grade C) in each paper. A student who secures less than 4.0 grade point (39% or less marks, Grade FC/FR) will be declared fail in that paper (subject) and shall be required to reappear for respective paper. A student who failed in University Examination (Theory) & passed in internal assessment of a same paper (subject) shall be given FC Grade. Such student will have to appear for University Examination only. A student who fails in Internal Assessment and passed in University examination (Theory) shall be given FR Grade. Such student will have to appear for both University examination as well as internal assessment. In case of Annual Pattern/Old Semester Pattern Students/candidates from the mark scheme the candidates shall appear for the same 70 marks paper of the external examination and his performance shall be scaled to 100 marks

- **ATKT**

Candidate passed in all the papers except 4 (four) papers combined together of the semester I and Semester II of B.Sc. Part I examination shall be permitted to enter upon the course of Semester III of B.Sc.Part II

SOLAPURUNIVERSITY, SOLAPUR

B.Sc. Part – II (Botany)

w.e.f.- JUNE, 2015

Semester – III

Paper – III: Structural Botany & Taxonomy of Angiosperms (45 Periods)

Unit- 1:Meristems: 07

1.1 Introduction and Classification of meristems

1.2- Functions of meristems

1.3 Theories of structural development –

a) The Apical cell theory

b) Histogen Theory

c) Tunica corpus theory

Unit-2: Permanent tissues 07

2.1 Structure and functions of simple tissues.

2.2 Structure and functions of Complex tissues-

2.3 Types of vascular bundles

Unit-3:Tissuesystems and their functions: 07

3.1 Epidermal Tissue System

3.2 Secretory Tissue System

3.3 Mechanical Tissue System

Unit-4:Primarystructure of plant organs **06**

4.1 Primary structure of monocot root and stem- (Maize)

4.2 Primary Structure of dicot root and stem-(Sunflower)

Unit-5: Secondary body of the plant **10**

5.1 Normal Secondary growth in Dicot root and stem.

5.2 Periderm, Lenticels and Annual rings.

5.3 Basic structure of wood and its types.-

5.4 Anomalous secondary growth in ***Bignonia*** and ***Dracaena***stem

Unit-6: Taxonomy of Angiosperms **08**

Study of Angiosperm families with respect to classification,morphology of vegetative and reproductive parts, floral formula, floral diagram, diagnostic features and economic importance.

a) Combretaceae b) Asclepiadaceaec) Amaranthaceaed) Liliaceae.

References Book:-

Paper:III Structural Botany and Taxonomy of Angiosperms

1. P.C.Vashista. Plant Anatomy.Pradip Publications, Opposite Sitlamandir, Jalandhar- 144008.
2. B.P.Pandey ,Plant Anatomy. S.Chand&Company,LTD. Ram Nagar, New Delhi.110055.
3. A.C.Datta. Botany For Deree students. Press-Delhi, Bombay, Madrass.S
4. Carlquist, S. 1998. Comparative Wood Anatomy: Systematic, Ecological and Evolutionary Aspects of dicotyledonous Wood. Springer – Verlag, Berlin.
5. Culter, E.G. 1969. PartI. Cells and Tissues. Edward Arnold, London.
6. Culter, E.G. 1971. Plant Anatomy: Experiment and Interpretation. Part II Organs. Edward Arnold, London.
7. Esau, K. 1977. Anatomy of Seed Plants, 2nd edition, John Wifey and Sons, New York.
8. Fahn, A. 1974. Plant Anatomy, 2nd edition. Pergamon Press, Oxford.
9. Lyndon, R.F. 1990. Plant Development: The Cellular Basis. Unwin Hyman, London.
10. Mauseth, J.D. 1988. Plant Anatomy. The Bonjamin/Cummings Publishing Company Inc., Metro Park, California, USA.
11. Nair, M.N.B. 1998. Wood Anatomy and Major Uses of Wood. Faculty of Forestry, Universiti Putra Malaysia, 43400 Serdang, Selangor D.E., Malaysia.
12. Rahvan, V. 2000. Developmental Biology of Flowering Plants. Springer-verlag, New York.
13. Raven, P.H., Evert, R.F. and Eichhorn, S.E. 1999. Biology of Plants. 5th edition. W.H., Freeman and Co., Worth Publishers, New York.

14. Steeves, T.A. and Sussex, I.M. 1989. Patterns in Plant Development, 2nd edition. CambridgeUniversity, Press, Cambridge.
15. Thomas, P. 2000. Trees: Their Natural History. CambridgeUniversity Press, Cambridge
16. Morphology of Angiosperms, J M Coulter and C J Chamberlain, Pointer Publishers, Jaipur.
17. Taxonomy of Angiosperm R Pandey, S Chand and Co. Ltd, Ramnagar New Delhi.110055
18. An Introduction to Taxonomy of Angiosperms-PritishShukla, Shital P Mishra, Vikas Publishing House, Pvt.Ltd.Gaziabad, UP.
19. A Text Book of Angiosperms-B P Pandey, S Chand and Co Ltd.ramnagar, New Delhi.110055
20. A Text Book of Botany -'Angiosperm,'V Singh C Pande, D K Jain, Rastogi Publication, Shivaji Road Meerut.250002
21. Taxonomy of Angiosperm, NeeruMathur, Sonali Publications, New Delhi, 110002.
22. Angiosperms-G L Chopra, Pradeep Publications, Jalandhar, 144008.

Paper-IV: PLANT ECOLOGY

(45 Periods)

Unit-1: Introduction **06**

1.1)Climatic factors**.**

1.2)Edaphic factors

Unit-2:Community Ecology- **08**

2.1) Form and structure of communities

2.2) Classification and Physiognomy.

2.3) Community characteristics

Unit-3: Ecosystem **11**

3.1) Concept and types

3.2) Components and Organization of ecosystem

3.3) Ecological pyramids, Food chains and food webs.

3.4) Energy flow in ecosystem.

3.5) Biogeochemical cycles – Nitrogen, Oxygen, Carbon,

Unit-4: Ecological Succession **06**

4.1) Concept and process

4.2) Primary and Secondary succession

4.3) Hydrosere and xerosere

Unit-5:Ecological adaptations **08**

5.1) Introduction

5.2) Xeric, Hydric and Mesic adaptations

Unit-6:Pollution: **06**

6.1) Introduction

6.2) Air pollution-Definition,Sources of air pollutants, their effects and control measures.

6.3) Water pollution-Definition,Sources of water pollutants, their effects and Controlmeasures.

References Book:-

Paper-IV-Plant Ecology

1. Odum, E.P. Ecology. Oxford&F.B.h.PublishingCo.pvt.LTD-New Delhi..
2. Barbour, M.G., Burk, J.H. and Pitts, W.D. 1987. Terrestrial Plant Ecology. Benjamin / Cummings Publication Co., California.
3. Kormondy, E.J. 1996. Concepts of Ecology, Prentice-Hall of India Pvt. Ltd., New Delhi.
4. Hill, M.K. 1997. Understanding Environmental Pollution. CambridgeUniversity Press.
5. Mackenzie, A. et al. 1999. Instant Notes in Ecology. Viva Books Pvt. Ltd., New Delhi.
6. Ashok Bendre / Ashok Kumar Economic Botany RastogiPublications Shivaji Road, Meerut – 250002 India.
7. Prof. M.A. Khan – Environment, Biodiversity and Couservation S-B Nangia, A.P.H. Publishing Corporation, 5, Ansari Road, Daryaganj New Delhi – 110002.
8. B.P. Pandey – Modern Practical Botany Vol – I / II Chand & Company Ltd. Ramnagar New Delhi – 110055.
9. B.P. Pandey – Economic Botany Vol – I / II Chand & Company Ltd. Ramnagar New Delhi – 110055.
10. Pavas Divan – Environ Protection – Deep & Deep Publications D-I 124, RajouriGarden, New Delhi – 110027.
11. P.S. Verma / V.K. Agrawal – Concept of Ecology, S. Chand &Lonpan Ltd. Ramnagar, New Delhi – 110055.
12. Eug Warming – Ecology of Plants, Ambey Publications Delhi (India)
13. Evgene P Odum – Ecology Oxford & IBH Publishing Co. Pvt. Ltd. Culcutta, New Delhi.

14. IshwarPrakash. Desert Ecology. Scientific Publications, Ratandas Road,Jodhpur.-342001-India.
15. T.W. Woodhead. Plant Ecology. SonaliPublications.New Delhi.110002.
16. Eug. Warming. Ecology of Plant. Ambey Publications Delhi.
17. Jonathan Silvertown. Introduction To Population Plant Ecology. Longman Singapure .Publisher, LTD.
18. R.S. Shukla& P.S. Chandel. Plant Ecology. S.Chand& Company LTD. Ram Nagar, New Delhi.110055.

SEMESTER- IV

Paper –V: Plant Physiology and Cytogenetics

(45 periods)

Unit-1: Photosynthesis: 12

1.1 Introduction and significance

1.2 Photosynthetic apparatus

1.3 Photosynthetic pigments, accessory pigments,Photosystems – reaction center complexes

1.4 Light reaction – cyclic and non-cyclic

1.5 Dark reactions - Calvin cycle, C4 cycle, CAM (NADP – ME type)

Unit-2: Transport of organic substances (Phloem Transport) 06

2.1 Definition and types of transport (Symplastic and apoplastic)

2.2 Phloem loading and unloading

2.3 Mechanism of translocation in phloem -Mass flow hypothesis,

Unit-3: Nitrogen metabolism 08

3.1 Introduction

3.2 Nitrogen cycle

3.3 Biological N_2 fixation – Definition, types & organisms involved

3.4 Mechanism of Biological Nitrogen fixation (Symbiotic and non symbiotic)

3.5 Significance of Biological Nitrogen fixation.

Unit-4:Physical basis of inheritance: - 07

4.1) Chromosome- Definition, types of chromosomes.

4.2)Study of Meiotic cell division and its significance.

Unit-5: **Classical genetics** **12**

5.1) Linkage-Definition, Kinds ofLinkage-complete, incomplete and linkage groups, Significance of linkage.

5.2)Crossing over-Definition, Mechanism of crossing over, 'Break and exchange' theory, (Stern and Hotta, 1969), Signifcance of crossing over.

References Book:-

Paper-V-Plant Physiology and Cytogenetics

1. Hopkins, W. G. 1995. Introduction to Plant Physiology. John Wiley & Sons, Inc., New York, USA.
2. Moore, T. C. 1989. Biochemistry and Physiology of Plant Hormones (2nd edition). Springer – Verlag, New York, USA.
3. Salisburry, F.B. and Ross, C.W. 1992. Plant Physiology (4th edition). Wadsworth Publishing Co., California, USA.
4. Taiz, L. and Zeiger, E. 1998. Plant Physiology (2nd edition) Sinauer Associates, Inc., Publishers, Massachusetts, USA.
5. R.C. Grewal – Plant Physiology Campus Brokes International 483/24, Prahiad street Ansari Road, Darya ganj, New Delhi – 110002.
6. V.K. Jain – Fundamentals of Plant Physiology, S. Chand & Company Ltd. Ramnagar, New Delhi – 110055.
7. Salisbury Ross – Plant Physiology CBS, Publishers & Distributions 485/ Jain Bhawan, BholeNath Nagar, Shahdara, New Delhi – 110032.
8. Devlin & Witham – Plant Physiology CBS Publishers & Distributors 485, Jain Bhavan, BholeNath Nagar, Shahdara, New Delhi – 110032.
9. G. Ray Noggle / G. Fritz Introductory Plant Physiology Prentice Hall of India Ltd. New Delhi – 110001.
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11. V.I. Paladin. Plant Physiology. Arihant Publishers. Jaypur, (India)
12. Dr. S. Sundararajan. Physiology Of Transport In Plants. Anmol Publications, Pvt. LTD. New Delhi.110002.

13. D.O.hall& K.K. Rao. Photosyntheis. Edward Arnold, East Street, Baltimore, Maryland-21202,U.S.A.
14. P.S Verma,V.KAgarwal,CellBiology,Genetics,Evolution and Ecology,S.Chand and Co.Pvt.Ltd.,Ramnagar,New Delhi,110055
15. W.R.Singleton, Elements of Genetics, VanNostrand, ReinholdCo.melborne, AffiliatedeastwestPress, pvt.ltd. newdelhi.
16. A.M Winchester,Genetics,Oxford and IBH,PublishingCo.New Delhi-110055.
17. P.S Verma, V K Agarwal;Genetics,S Chand and Co.Ramnagar,New Delhi-110055
18. Dr (Mrs.) Veer BalaRastogi,A text Book of Genetics,KedarnathRamnath road,Meerut-250001.
19. H.S Bhamrah,KavitaJuneja,Genetics and Evolution,AnmolPublication,Pvt.ltd.New delhi-110002.

Paper-VI: Utilization of Plant

(45 Periods)

Unit-1: Botanical names, Morphology, Source and Economic importance of the followings **10**

1.1) Legumes-Pulse crops-Chickpeaand Red gram, Fodder legumes - Lucerne and *Sesbania*

1.2) Plant Fibers-Cotton and Coir

Unit-2: Vegetable oil sources **05**

2.1. Botanical name, source and economic importance of – Groundnut, Soybean.

2.2 Brief account of cultural practices of Ground nut and Soybean.

Unit -3:- Medicinal plants **10**

A brief account of plant drugs and their chief constituents used in Indigenous and allopathic systems in –

A) Rhizome – *Zingiberofficinale*
B) Root –*Withaniasomnifera*
C) Stem – *Tinosporacordifolia*
D) *Leaf –Adhatodazeylanica.*
E) Floral bud – *Syzigiumaromaticum*
F) Fruit – *Emblicaofficinalis*

Unit-4:- Natural Products **12**

4.1)**Rubber** – Introduction, properties of rubber, source (*Heveabrasilensis*), morphologicl characters ,extraction method and economic importance

4.2)**Botanical pesticides-**

Introduction- Botanical name, morphological characters, source and importance ofNeem, Tobacco, Custard apple.

4.3) PlantDyes - Botanical name, sourceand economic importance.

a) Wood-Log wood,Kutch.

b) Bark-Oak,Teak.

c) Root and rhizome -Manjista,Turmeric,

d) Leaves- Indigo, Henna.

e) Flowers-Saffron,Palas.

Unit 5:Ornamental Plants:-Botanical name and ornamental value of following plants. **04**

5.1) Seasonals - ***Celosia, Chrysanthemum sp.***

5.2) Perennials – ***Acalypha,Crossandra, sp.***

5.3)Cacti and succulents – ***Opuntia and Bryophyllum***

5.4) Climbers – ***Bougainvillea, Quisqualis sp.***

Unit 6: Plants perfumes and cosmetics **04**

6.1. Introduction, Botanical name, source and economic importance of Citronella,

Jasmine, Rose, Aloe

References Book:-

Paper-VI: Utilization of Plant

1. R.C. Grewal – Medicinal plants, Campus Books International 4831/24, Prahiad street, Ansari Road, Darya Ganj, New Delhi – 110002. Fax : 91-011-3257835.

2. F.O. Bower – Plants and Man Ariana Publishing House, New Delhi – 110012.

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7. Tippo, O. and Stern, W.L. 1977. Humanistic Botany. W.W. Norton, New York.

8. B.P.Pandey Economic Botany. S.Chand& Company pvt. LTD. Ram Nagar New Delhi. 110055.

9. Bentley &Trimen. Medicinal Plants. Asiatic Publishing house, 181 D.J. Extension, Laxmi Nagar. Delhi. 110092.

10. Robert Brentley& Henry Trimen. Medicinal Plants. Londan J &AChureldill.NewRulington Street.

11. He nery Kraemer Applied Economic Botany Ambey Publications, New Delhi.

12. A Textbook of economic Botany (EDN 1989)

By SAMBA MURTY & N S Subramanyam. Publ.WileyEsternLTD.New Delhi .

13. A Text book of Medicinal plants .Prajkta, Purohit, Sharma, Kumar (2007)

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Solapur University, Solapur

PRACTICALS IN BOTANY AT B.Sc. Part – II

(w.e.f.- June 2015)

Botanical excursions – One teacher along with a batch not more than sixteen students be taken for Botanical excursions to places of botanical interest, one in each term. If there are female students in a batch of sixteen, one additional lady teacher is permissible for excursion. Each excursion will not be more than 5 days during college working days. T.A. and D.A. for teachers and non teaching staff participating in the excursions should be paid as per the rules. The tour report duly certified by the concerned teacher and the head of the department should be submitted at the time of practical examination.

Practical – I and II are to be covered in 25 practicals each. These practicals are to be performed by the students. Each practical is to be supplemented by permanent slides, preserved / fresh specimens / materials, charts, herbarium sheets, wherever necessary.

Every candidate must produce a certificate from Head of the Department in his / her college stating that he / she has completed practical course in a satisfactory manner as per the lines laid down by academic council on the recommendations of Board of Studies in Botany. The student should record his / her observations and report of each experiment should be written in the Journal.

The Journal is to be signed periodically by teacher in charge and certified by Head of the Department at the end of the year. Candidates have to produce their certified journal and tour reports at the time of practical examination. A candidate will not be allowed to appear for the practical examination without a certified journal, otherwise a candidate must produce a separate certificate of his / her regular attendance for practical course and completion of the same signed by the concerned teacher and Head of the Department.

Distribution of Marks:

Practical – I ---------- 70 Marks

Sr. No.	Particulars	
1)	Structural Botany and Taxonomy of Angiosperms.	25Marks
2.)	Plant Ecology	25Marks
3.)	Journal	10 Marks
4.)	Tour report	10 Marks

Practical – II ---------- 70 Marks

1)	Plant Physiology and Cytogenetics	25 Marks
2.)	Utilization of Plant	25 Marks
3.)	Journal	10Marks
4.)	Horticultural Term Paper	10Marks

Each practical examination (Practical I and II) should be of maximum. 5 hours duration and shall test a candidate in respect of following –

i. Identification and preparation of temporary and permanent slides.
ii. Practical study of external and internal structures of different plants as per the syllabus.
iii. Identification of the angiosperm specimen and assigning to its family with FF and FD
iv. Understanding of principles of the experiments.
v. Identification and setting of ecological experiments.
vi. Identification and setting of Physiological experiments.

vii. Solving problems based on linkage and crossing over

viii. Recording of observations and conclusions.

ix. Identification of the plant specimen ,mounting (reproductive structures) and classification

x. Identification and understanding of the practicals conducted with respect to development of plants and their utilization.

xi. Spotting of the specimens as per the syllabus.

x. Submission of the tour report and Horticultural term paper.

B.Sc. Part – II (Botany)

Practicals (Laboratory Exercise)

Practical No. I (Based on Paper – III&IV)

1) Study of organization in.shoot tips of V S of- ***Hydrilla*** /***Bryophyllum*** (w.m.).

2) Study oforganization in root tips of V.S –ofOnion / Aerial roots of ***Ficus*** (w.m)

3) Study of primary structure of root and stem of monocot plant using hand sections Or permanent slides (Maize)

4) Study of primary structure of root and stem of dicot plant using hand sections Or permanent slides (Sunflower)

5)Secondary growth in dicot stem and root.(Sunflower)

6)Anomalous secondary growth in ***Bignonia*** stem by using permanent double stained technique

7) Anomalous secondary growth in ***Dracaena*** stem by using Permanent double stained technique.

8)Maceration technique

9)Study of Epidermal tissue system.

10) Study of Mechanical tissue system.

11) Study of Secretory tissue system..

12) Study of anatomy of porous (ring porous & diffused porous) and non porous wood

13-16) Study of Angiosperm families as per syllabus.

17) Study of the working and use of meteorological instruments.(Any three)

18) Study of soil pH and water holding capacity (any two soil samples)

19) Determination of density & frequency of different plant species by quadrat method.

20) To prepare a report on any ecosystem from nearby locality. (Supplimentary)

21) Ecological adaptations in morphology and anatomy of hydrophytes –

1) Submerged-(*Hydrilla*) 2) Floating, (*Eicchornia*) 3) Amphibious (*Typha*)

22) Ecological adaptation of xerophytes (***Nerium***&***Aloe***).

23) Ecological adaptations of Epiphyte (orchid) and parasite (***Cuscuta***)

24) Detection of Sulphate, Chloride From polluted water sample(Demo.)

25) Tour report (To be written separately and submitted)

Practical No. II -(Based on Paper V & VI)

1) Separation of photosynthetic pigments by ascendingPaper chromatography.

2) To study the effect of CO_2 concentration on the rate of photosynthesis.

3) To study C_3 and C_4 plants by Kranz anatomy.

4) Estimation of TAN.

5) Study of Osmosis.

6) To study the permeability of plasma membrane.

7) Study of root nodules in any legume crop.

8) Study of meiosis (Smear preparation) using onion buds.

9-10) Problems on linkage and crossing over

11) Study of Vegetative, Floral morphology and pod in Chickpea, Red gram.

12) Study of fodder legumes- Source and uses- *Sesbania* and Lucern

13) Study of structure of oil storing tissues in sectioned seeds of Groundnut, and Coconut endosperm using micro chemical tests.

14) Study of vegetative, Floral and Fruit morphology of Cotton. Microscopic structure Cotton fiber,

15-18) Study of plants (live or herbarium) used as resource of drugs as per theory.

19) Study of plant pesticides(as per theory)

20) Study of dyes -source and uses (as per theory)

21-22) Study of ornamental plants, seasons of flowering plants, botanical name morphology and uses. (as per theory)

23) Study of plant perfumes and cosmetics (as per theory)

24-25)Horticultural term Paper-Based on – Seasonals/ perennials/ Climbers/ cacti/ succulents/ bonsai/ indoor plants and cut flowers etc.

Solapur University, Solapur

B.Sc. Part – II Practical Examination, March / April 201--

BOTANY PRACTICAL – I

Centre: **Total Marks: 70**

Date: **Time: 11.00 a.m. onwards**

N.B.: 1. Draw near labeled sketches whenever necessary.

2. Do not write about theoretical points, unless asked specifically.

3. Record your observations carefully and neatly wherever asked.

Q. 1 Make a double stained permanent micro preparation of a T.S. of Specimen A and show it to the examiner (No written answer) 08

Q. 2 Macerate the given material 'B' and prepare the slide from it. Show the slide to the examiner (No written answer) 05

Q-3 Assign the specimen 'C' to its respective family on the basis of characters observed by you in it. Give important vegetative and floral characters. Draw the floral diagram / write the floral formula of it (Written answer). 08

Q. 4 Prepare the list quadrat of the marked area and find out the percentage Frequency / Density of different species there in. 10

Q-5- Set up the ecological experiment 'D' assigned to you & show it to the examiner 09

Or

Describe the ecological adaptation in the given specimen. 'D'

Q. 6 Identifications

a) Identify and describe (Anatomy) 02

b) Identify and describe (Anatomy) 02

c) Identify and describe (Ecology) 02

d) Identify and comment – (Ecology) 02

e) Identify and comment – (Ecology) 02

Q. 7 a) Journal 10

b) Excursion report. 10

70

Solapur University, Solapur.

B.Sc. Part – II Practical Examination, March / April 201....

BOTANY PRACTICAL – II

Centre: **Total Marks: 70**

Date: **Time: 11.00 am onwards**

N.B. : 1. Draw near labeled sketches wherever necessary.

2. Do not write about theoretical points, unless asked specifically.

3. Record your observations carefully and neatly wherever asked.

Q. 1) Set up the physiological experiment assigned to you and record your observation, submit the report to the examiner (Written answer). 09

Q. 2) Arrangethe physiological experiment given to you and show it to the examiner.

(No written answer). 06

Q-3) Solve the genetic problem based on linkage and crossing over.(Written answer). 08

Q-4) Identify, give the botanical name,source and economic importance of Specimen 'A'

(Written answer). 09

Q. 5)Identify, give the botanical name, and uses of Specimen 'B' & 'C'.(written answer). 08

Q. 5) Identifications:

a) Identify and comment – (Cytogenetics)	02
b) Identify and comment – (Plant utilization)	02
c) Identify and comment – (Plant utilization)	02
d) Identify and comment (Plant utilization)	02
e) Identify and comment (Plant utilization)	02
Q. 6) a) Journal	10
b) Horticultural term paper	10

	70

Solapur University, Solapur

Nature of Question Paper forCredit-Grading Semester Pattern

• Faculty of Science

B.Sc.II

(w.e.f. June 2015)

Time: - 3.0hrs. Total Marks- 70

Q. No.1) Multiple choice questions. (10)

1) ----------

a) b) c) d)

2)

3)

4)

5)

6)

7)

8)

9)

10)

Q.No.2) Answer any five (out of seven)of the following.(15)

i)

ii)

iii)

iv)

v)

vi)

vii)

Q.No.3) Answer any three(outof four) of the following. (15)

i)

ii)

iii)

iv)

Q.No.4) Answer any three(out of four) of the following. (15)

i)

ii)

iii)

iv)

Q.No.5) Write short notes on any**three(out of four) of the following.** (15)

i)

ii)

iii)

iv)