

**GONDWANA UNIVERSITY**  
**GADCHIROLI**

**SEMESTER SYSTEM PATTERN SYLLABUS**

for

**B.Sc.**

**BOTANY**

(With effect from : 2012-13)

# GONDWANA UNIVERSITY

## GADCHIROLI

### SEMESTER SYSTEM PATTERN SYLLABUS FOR **B.Sc. BOTANY** (With effect from : 2012-13)

#### B.Sc.

<b>SEMESTER – I :</b>	Paper – I	: Diversity of Microbes and Algae	50 marks
	Paper – II	: Diversity of Fungi, Lichens, Bryophytes and Plant pathology	50 marks
	Practical – I	: Based on Paper – I & II Of Semester – I	30 marks
	Internal Assessment	: Based on Assignment/Seminar & Unit Test	20 marks

<b>SEMESTER – II :</b>	Paper – I	: Pteridophyta, Palaeobotany and Gymnosperms	50 marks
	Paper – II	: Angiosperm : Morphology & Anatomy	50 marks
	Practical – II	: Based on Paper – I & II Of Semester – II	30 marks
	Internal Assessment	: Based on Assignment/Seminar & Unit Test	20 marks

# GONDWANA UNIVERSITY

## GADCHIROLI

### SEMESTER SYSTEM PATTERN SYLLABUS FOR B.Sc. BOTANY

#### SEMESTERWISE DISTRIBUTION OF MARKS

Sr.No.	Class	Semester	Theory Paper Marks		Internal Assessment	Practical Marks	Total Marks
			Paper I	Paper II			
1	B.Sc. Part I	I	50	50	20	30 (assess internally)	150
2		II	50	50	20	30 (assess externally)	150
3	B.Sc. Part II	III	50	50	20	30 (assess internally)	150
4		IV	50	50	20	30 (assess externally)	150
5	B.Sc. Part III	V	50	50	20	30 (assess internally)	150
6		VI	50	50	20	30 (assess externally)	150
			<b>300</b>	<b>300</b>	<b>120</b>	<b>180</b>	<b>900</b>

#### SEMESTERWISE WORKLOAD:

CLASS	SEMESTER	PAPER	WORKLOAD/WEEK	
			Theory	Practical
B.Sc. I	I	I	3	6
		II	3	
	II	I	3	6
		II	3	
B.Sc. II	III	I	3	6
		II	3	
	IV	I	3	6
		II	3	
B.Sc. III	V	I	3	6
		II	3	
	VI	I	3	6
		II	3	

## **PATTERN OF EXAMINATION**

### **Theory :**

Two theory papers of 50 marks each and of three hours duration will be conducted at the end of each semester.

### **Practicals :**

1. One Practical examination of 30 marks and of five hours for each semester will be conducted at the end of the same semester.
2. Practical examination of semesters I, III and V will be conducted by Internal examiner only.
3. Practical examination of semesters II, IV and VI will be conducted by Internal & external examiners both.
4. Internal assessment of the student will be done on the basis of evaluation report from the concerned teacher and will be done at the end of each semester.
5. Distribution of 20 marks for internal assessment is as under –

Assignment/Seminar	10 marks
Unit Test	10 marks

### **Botanical Excursion :**

Botanical Excursion is compulsory for B.Sc. I, II & III year students. One long excursion in or out of state and as many as short field visits to the places of Botanical interest, one in each term are compulsory.

One teacher and one non-teaching staff for 20 students are taken for Botanical Excursion. If there are female students in a batch of twenty students, one additional lady teacher is permissible for excursion. T.A. and D.A. for teacher and non-teaching staff participating in excursions should be paid as per university rules. Tour report duly certified by teacher concerned and Head of the Department should be submitted at the time of practical examination.

### **Practical Course :**

Botany practical course is to be covered in 26 practicals of 3 periods each as per the given schedule. These practicals are to be performed by the students. Each practical is to be supplemented by permanent slides/preserved or fresh specimens / materials / charts / herbarium sheet wherever necessary.

## **Details of Practical Examination :**

A) Every student must produce a certificate from Head of the Department of his/her college, saying that he/she has completed practical course in satisfactory manner. The student should record his/her observations and report of each experiment in the journal. The journal is to be signed periodically by teacher-in-charge & certified by Head of the Department at the end of the semester. Students have to submit their certified journal and tour report at the time of practical examination. Practical Examination should be of five hours duration and shall test a candidate in the following respect.

1. Practical study of external & internal structure of different plant types and their classification
2. Making temporary or permanent stained preparations and identification
3. Study of plant families as per syllabus
4. Study of Anatomical material with temporary or double stained preparation
5. Spotting of the specimens/ slides as per syllabus
6. Physiology experiments as per syllabus
7. Ecology experiments as per syllabus
8. Identification and setting of biochemical experiments

**GONDWANA UNIVERSITY**  
**GADCHIROLI**

SEMESTER SYSTEM PATTERN

**BOTANY**

**Question Paper Pattern**

Time : 03 hrs.

Total Marks : 50

Question 1. Write notes on :

02 x 05 = 10  
OR 01 x 10 = 10

- A) Unit I                      OR            A) Unit II  
B) Unit I                      B) Unit II

Question 2. Write notes on :

02 x 05 = 10  
OR 01 x 10 = 10

- C) Unit III                    OR            C) Unit IV  
D) Unit III                    D) Unit IV

Question 3. Write notes on :

04 x 2 ½ = 10

- a. Unit I                      OR            e. Unit I  
b. Unit II                      f. Unit II  
c. Unit III                      g. Unit III  
d. Unit IV                      h. Unit IV

Question 4. Write notes on :

04 x 2 ½ = 10

- a. Unit I                      OR            e. Unit I  
b. Unit II                      f. Unit II  
c. Unit III                      g. Unit III  
d. Unit IV                      h. Unit IV

Question 5. Write any ten questions in one or two lines only  
(Diagrams are NOT necessary)

01 x 10 = 10

- a. Unit I                      g. Unit III  
b. Unit I                      h. Unit III  
c. Unit I                      i. Unit III  
d. Unit II                      j. Unit IV  
e. Unit II                      k. Unit IV  
f. Unit II                      l. Unit IV

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SEMESTER SYSTEM PATTERN SYLLABUS  
FOR  
**B.Sc.**  
**BOTANY**  
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### DETAILS OF THE SYLLABUS

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# GONDWANA UNIVERSITY

## GADCHIROLI

SEMESTER SYSTEM PATTERN SYLLABUS

FOR

B.Sc. BOTANY

**B.Sc.**

**SEMESTER – I**

Paper – I

### Diversity of Microbes and Algae

- UNIT – I** :
1. General characteristics of life
  2. Viruses :
    - i. General characteristics & nature of viruses
    - ii. Classification of viruses based on host
    - iii. Modes of transmission of viruses
    - iv. Structure and multiplication (Lytic & Lysogenic cycle) of T<sub>4</sub>-Bacteriophage.
    - v. Ultra structure of TMV
    - vi. Economic importance
  3. Mycoplasma : Structure, characteristics & pathogenicity
- UNIT – II** :
1. Bacteria :
    - i. Morphology of Bacteria (size and shape)
    - ii. Cell structure
    - iii. Classification (on the basis of Gram Staining)
    - iv. Reproduction (Asexual and Sexual)
    - v. Economic importance
  2. Cyanobacteria :
    - i. General character (unicellular and filamentous)  
Chroococaceae eg. *Gloeocapsa*, Nostacaceae eg. *Nostoc*
    - ii. Ultrastructure
    - iii. Reproduction
    - iv. Economic importance
- UNIT – III** :
1. Concept of plant kingdom – Cryptogams and Phanerogams
  2. Algae :
    - i. General characters
    - ii. Classification (G.M. Smith, 1955)
    - iii. Economic importance
    - iv. Life history of – Chlorophyceae eg. *Chlamydomonas*  
eg. *Oedogonium*
- UNIT – IV** :
1. Life history of – Charophyceae eg. *Chara*  
Xanthophyceae eg. *Vaucheria*  
Phaeophyceae eg. *Ectocarpus*  
Rhodophyceae eg. *Batrachospermum*

Note : Developmental stages not expected.



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**SEMESTER – I**

Paper – II

### Diversity of Fungi, Lichens, Bryophyta and Plant Pathology

- UNIT – I :**
1. Fungi :
    - i. General characteristics
    - ii. Classification (G. C. Ainsworth, 1971)
    - iii. Life history of – Mastigomycotina eg. *Albugo*  
Zygomycotina eg. *Mucor*
- UNIT – II :**
1. Fungi :
    - i. Life history of – Ascomycotina eg. *Penicillium*  
Basidiomycotina eg. *Puccinia*  
Deuteromycotina eg. *Cercospora*
    - ii. Economic importance
  2. Lichens :
    - i. General characteristics
    - ii. Types ( Crustose, Foliose, Fruticose)
    - iii. Economic importance
- UNIT – III :**
1. Bryophyta :
    - i. General characteristics
    - ii. Classification (Smith)
    - iii. Economic importance
    - iv. Life history of – Hepaticopsida eg. *Riccia*  
Anthocerotopsida eg. *Anthoceros*  
Bryopsida eg. *Funaria*
- UNIT – IV :**
1. Plant Pathology :
    - i. Classification of plant diseases (Viral, Bacterial, Fungal)
    - ii. Study of following diseases with respect to host pathology, symptoms, management and control measures.
      - a) Viral Disease : Mosaic of Tobacco (TMV)
      - b) Fungal Disease : Red rot of Sugarcane  
(*Colletotrichum fulcatum*)  
: Brown spot of rice  
(*Helminthosporium oryzae*)  
: Loose smut of wheat  
(*Ustilago hordei*)
      - c) Bacterial disease : Bacterial Blight of Cotton  
(*Xanthomonas compestris*)

Note : Developmental stages not expected.

# B.Sc. (BOTANY)

## SEMESTER – I

### REFERENCE BOOKS

- 1 Smith, K. M. : Plant Viruses [1992] 6<sup>th</sup> Ed. (University Book Stall, New Delhi)
- 2 Tortora, G.E.B.R.Funke, C. L. Case [1997] : Microbiology, An Introduction, 6<sup>th</sup> Ed. (Addison Neslley Logman, Inc.)
- 3 Dubey, RC, DK Maheshwari [1999] : Text Book of Microbiology (S. Chand & Co.)
- 4 Sharma, P.D. [1993] : Microbiology and plant pathology (Rastogi & Co.)
- 5 Clifotn, A [1958] : Introduction to the Bacteria (McGraw Hill & Co. N.Y.)
- 6 Carr, N. J. and B. A. Whitton [1973] : The Biology of Blue Green Algae (Univ. of California press, Berkeley)
- 7 Fogg, G.E.W.D. P. Stewart, P. Ray and A.E. Walsby [1973] : The Blue – Green Algae (Academic Press, London)
- 8 Bold, H.C.C.J Alexopoulos and T Delevoryas [1980] : Morphology of Plants and Fungi (Harper and Row Publishers, N.Y.)
- 9 Singh, V.P. C. Pande, D. K. Jain [1995] : A Text Book of Botany (Rastogi & Co. Meerut)
- 10 Ganguly, Kar : College Botany, Vol II (New Central Book Agency, Calcutta)
- 11 Bold, H. C. and M. J. Wynne [1978] : Introduction of Algae : Structure and Reproduction (Prentice Hall of India, Pvt. Ltd.)
- 12 Chapman, V. J. [1962] The Algae (Macmillan and Co. Ltd.)
- 13 Dodge, J. D. [1973] : The Fine Structure of Algal Cell (Academic Press, London)
- 14 Kumar, H. D. and H. N. Singh [1982] : A text book of Algae (Affiliate East-West Press, Pvt. Ltd., New Delhi)
- 15 Prescott, G. W. [1969] : The Algae-A Review (Moughton miffin Cop)
- 16 Round, F. E. [1973] : The Histology of the Algae, 2<sup>nd</sup> Ed. (Edward Arnold)
- 17 Sharma, O. P. [1992] : Text Book of Thallophytes (McGraw Hill Publishing Co.)
- 18 Smith, G. M. [1971] : Cryptogamic Botany, Vol. I Algae and Fungi (TMH)
- 19 Vasishtha, B. R. [1990] : Algae (S. Chand & Co. New Delhi)
- 20 Bhatia, Algae
- 21 Alexopoulos, C. J. and G. W. Min & M. Blackwell, Indrodctory Mycology, CBS distributors & publishers, Delhi
- 22 Dube, H. C. [1990] introduction to Fungi (Vikas Publishing House Pvt. Ltd, Delhi)
- 23 Sharma, P. D. [1991] : The Fungi (Rastogi & Co. Meerut)
- 24 Vasishta, B. R. [1990] : Fungi (S. Chand & Co. New Delhi)
- 25 Sharma, O. P. : Fungi (TMH)
- 26 Agrios, G. N. 1997 Plant Pathology, 4<sup>th</sup> ed. (Harcourt Asia PTE Ltd. Academy Press)
- 27 Ainsworth, G. C. 1971 Ainsworth and Bisby's Dictionary of the Fungi, 6<sup>th</sup> ed. (Commonwealth Mycological Institute, Kew Surrey)
- 28 Mehrotra, R. S. and Aneja, K. R. 1990 : An Introduction to mycology (Wiley Estern Ltd.)
- 29 Prem puri [1980] : Bryophyta (Atma Ram & Sons Delhi)
- 30 Ram Udar [1970] : An Introduction ot Bryophyta (Shashidhar Malviya Prakashan, Lacknow)
- 31 Vashishtha, B. R. [1992] : Bryophyta (S. Chand & Co. New Delhi)
- 32 Parihar, N. S. [1997] The Biology and Morphlogy of Bryophytes (Central Book Depot, Allahabad)
- 33 Sporne, K. R. J : The Morphology of Bryophytes (Hutchinson University, London)
- 34 Srivastava H. N. [2006] : Diversity of Microbes & Cryptogams (Pradeep Publications, Jalandhar)
- 35 Pandey, B. P. [2007] : Botany for Degree Students (S. Chand & Co. New Delhi)

**B.Sc.**  
**Botany Practicals**  
**SEMESTER – I**

**Laboratory Exercises :**

Make use of the permanent micropreparation, transparencies, photographs, temporary mounts, etc.

- 1) Study of Compound and Dissecting microscope
- 2) Study of bacterial forms and permanent micropreparations
- 3) Gram staining of Bacteria
- 4) Study of Cyanobacteria (Nostoc)
- 5) Study of Algae : (i) *Oedogonium*  
(ii) *Chara*  
(iii) *Voucheria*  
(iv) *Ectocarpus*  
(v) *Batrachospermum*
- 6) Study of Fungi : (i) *Albugo*  
(ii) *Mucor*  
(iii) *Penicillium*  
(iv) *Puccinia*  
(v) *Cercospora*
- 7) Study of Lichens : Crustose, Foliose & Fruticose
- 8) Study of Bryophyta : (i) *Riccia*  
(ii) *Anthoceros*  
(iii) *Funaria*
- 9) Study of Plant Diseases: (i) Viral Mosaic Disease of Tobacco (TMV)  
(ii) Red rot of sugarcane  
(iii) Brown spot of rice  
(iv) Loose smut of wheat  
(v) Bacterial disease on cotton

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### SEMESTER SYSTEM PATTERN SYLLABUS

FOR

**B.Sc. BOTANY**

**B.Sc.**

**SEMESTER – I**

**PRACTICAL**

Based on Theory Papers of Semester-I

[Time 5 hours]

[Marks – 30]

- Que 1 : Gram- stain the bacterial strain / stain the **Cyanobacterial** material [A] and Identify? (Writing not necessary) 03 marks
- Que 2 : Identify & classify the given **Algal** material [B] ( Writing 2 marks, Slide preparation 2 marks) 04 marks
- Que 3 : Identify & classify the given **Fungal** material [C] ( Writing 2 marks, Slide preparation 2 marks) 04 marks
- Que 4 : Identify & classify the given **Bryophytic** material [D] ( Writing 2 marks, Slide preparation 2 marks) 04 marks
- Que 5 : Spotting – Identification 1/2 mark and characters 1/2 mark 10 marks
- |                  |                    |
|------------------|--------------------|
| E) Bacteria      | J) Fungi           |
| F) Cyanobacteria | K) Bryophyta       |
| G) Algae         | L) Bryophyta       |
| H) Algae         | M) Plant pathology |
| I) Fungi         | N) Plant pathology |
- Que 6 : Practical Record (3 marks) 05 marks  
Excursion Report (2 marks)

**Note :** Well labelled diagrams are expected wherever necessary

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**SEMESTER – II**

Paper – I

**Pteridophyta, Paleobotany and Gymnosperm**

- UNIT – I** :
1. Pteridophyta : i. General characteristics
    - ii. Classification (G. M. Smith)
    - iii. Types of stele
    - iv. Life history of – Psilophyta eg. *Rhynia*  
Lycophyta eg. *Selaginella*
- UNIT – II** :
1. Pteridophyta : Life history of – Arthrophyta eg. *Equisetum*  
Filicophyta eg. *Marsilea*
  2. Concept of Heterospory and Seed habit
  3. Telome theory
- UNIT – III** :
1. Paleobotany : i. Geological time scale
    - ii. The process of fossilization  
(Replacement theory, Infiltration theory)
    - iii. Types of fossils (Impression, Compression and Petrification)
    - iv. Fossil gymnosperm : (a) *Glossopteris*(Pteridospermatophyta)  
(b) *Cycadeoidea* (Cycadopsida)
- UNIT – IV** :
1. Gymnosperm : i. General characteristic
    - ii. Classification (Sporne, 1965)
    - iii. Life history of – Cycadales eg. *Cycas*  
Coniferales eg. *Pinus*

Note : Developmental stages not expected.

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## GADCHIROLI

### SEMESTER SYSTEM PATTERN SYLLABUS

FOR

B.Sc. BOTANY

**B.Sc.**

### SEMESTER – II

Paper – II

### Angiosperms : Morphology and Anatomy

**UNIT – I** : Morphology of Angiosperm: 1. Mode of living (Autotrophic and Heterotrophic)

2. Habit : Erect forms, weak forms

3. Root : i. Normal root (Tap and Fibrous)

ii. Modified root (Modification of Tap and Adventitious roots)

4. Stem : i. Branching pattern

ii. Modification of stem

5. Leaf : i. Parts of foliage leaf

ii. Lamina – shape, margin, apex, base surface, texture, venation.

iii. Types of leaves (simple and compound)

iv. Modification of leaves

v. Phyllotaxy

vi. Stipules

**UNIT – II** : Morphology of Angiosperm: 1. Inflorescence : Types – (Racemose, Cymose and Special)

2. Flower : i. Flower is a modified shoot evidences

ii. Types (Neuter, Achlamydeous, Monochlamydeous, Dichlamydeous, Sessile & Pedicellate, Cyclic and Acyclic)

iii. Parts of flower (Perianth, Calyx and its modification, Corolla, Aestivation, Androecium, Gynoecium)

iv. Floral formula and Floral diagram

3. Fruit : Types of fruit

**UNIT – III :**

- Anatomy :
1. Meristems :
    - i. Classification (based on origin and position)
    - ii. Root apical Meristem (Newman Theory)
    - iii. Shoot apical Meristem  
(Tunica-Carpus Theory)
  2. Tissue : Types (Simple, Complex, and Secretary)
  3. Vascular Bundle : Types
  4. Xylem : Structure and function
  5. Phloem : Structure and function
  6. Cambium : Structure and function
  7. Periderm : Structure and function

**UNIT – IV :**

- Anatomy :
1. Primary structure :
    - i. Dicot root eg. *Sunflower*
    - ii. Monocot root eg. *Maize*
    - iii. Dicot stem eg. *Sunflower*
    - iv. Monocot stem eg. *Maize*
    - v. Dicot leaf eg. *Sunflower*
    - vi. Monocot leaf eg. *Maize*
  2. Secondary structure :

Dicot stem eg. *Moringa*
  3. Anamolous secondary growth in stem:
    - i. *Bignonia*
    - ii. *Boerhaavia*
    - iii. *Dracaena*
  - 4.. Anamolous secondary growth in root:

eg. *Beta vulgaris*

**B.Sc.**  
**(BOTANY)**  
**SEMESTER – II**

**REFERENCE BOOKS**

- 1 Parihar, N. S. [1997] The Biology and Morphology of Pteridophytes (Central Book Depot, Allahabad)
- 2 Rashid, A. [1989] : An Introduction to Pteridophyta (Vikas Publishing House Pvt. Ltd., New Delhi)
- 3 Sharma, O. P. [1990] : Text Book of Pteridophyta (McMillan India Ltd.)
- 4 Cutter, E. G. 1971, Plant Anatomy Experiment and Interpretation Part II. Organs. Edward Arnold, London
- 5 Esau, K. 1979 Anatomy of seed Plants, 2<sup>nd</sup> Edn. John Wiley and Sons New York
- 6 Esau, K. Plant Anatomy John Wiley and Sons New York
- 7 Fahn, A. 1974 Plant Anatomy, 2<sup>nd</sup> Edn. Pergamon Press, Oxford.
- 8 Mauseth, J. D. 1988. Plant Anatomy. The Benjamin/Cummings Publishing Company Inc. Menlo Park, California, U.S.A.
- 9 Bhatnagar, S. P. and Moitra A. 1996 Gymnosperms. New Age International Limited, New Delhi
- 10 Davis, P. H. and Heywood V. H. 1963. Principles of Angiosperm Taxonomy. Oliver and Boyd London.
- 11 Gifford, E. M. and Foster A. S. 1988. Morphology and Evolution of Vascular Plants. W. H. Freeman & Company, New York.
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- 19 Stace, C. A. 1989. Plant Taxonomy and Biosystematics (2<sup>nd</sup> Edn.). Edward Arnold, London.
- 20 Stewart, W. N. and G. W. Rothwell 1993 : Paleobotany and the Evolution of Plants, 2<sup>nd</sup> Edn. Cambridge University Press.
- 21 Thomas, P. 2000. Trees : Their Natural History. Cambridge University Press.
- 22 Pande, P. B. Text Book of Botany. S. Chand & Co.
- 23 Bierhorst, D. W. [1971] : Morphology of Vascular Plants. Macmillan & Co. N. R.
- 24 Dutta, S. C. 1989. Systematic Botany. Wiley Eastern Co.
- 25 Mukerjee, S. K. 1984. College Botany Vol. III New Central Book Agency, Calcutta.
- 26 Dutta, A. C. – College Botany
- 27 Naik, V. N. – Taxonomy of Angiosperm
- 28 Shrivastava, H. N. [2006] : Pradeep's Botany Vo. II (Pradeep Publication, Jalandar)



**B.Sc.**  
**Botany Practicals**  
**SEMESTER – II**

**Laboratory Exercises :**

Make use of the permanent micropreparation, transparencies, photographs, temporary mounts, etc.

- 1) Study of Pteridophytes :
  - (i) *Selaginella*
  - (ii) *Equisetum*
  - (iii) *Marsilea*
- 2) Study of types of fossils (Impression, Compression and Petrification)
- 3) Study of fossil Gymnosperms :
  - (i) *Glossopteris*
  - (ii) *Cycadeoidea*
- 4) Study of Gymnosperms :
  - (i) *Cycas*
  - (ii) *Pinus*
- 5) Study of Vegetative Morphology of Angiosperms :
  - (i) Root (Type, modification)
  - (ii) Stem (Branching pattern, modification)
  - (iii) Leaves (Type, phyllotaxy, venation, modification)
- 6) Study of Reproductive Morphology of Angiosperms :
  - (i) Inflorescence (Types : Racemose, Cymose & Special)
  - (ii) Flower (Types, parts of flower)
  - (iii) Fruit (Types)
- 7) Study of Anatomy of primary structure in :
  - (i) Dicot : Root, stem & leaf eg. Sunflower
  - (ii) Monocot : Root, stem & leaf eg. Maize
- 8) Study of Anatomy of secondary structure in Dicot stem eg. *Moringa*
- 9) Study of Anamolous secondary growth in stems of :
  - (i) *Bignonia*
  - (ii) *Boerhaavia*
  - (iii) *Dracaena*
- 10) Study of Anamolous secondary growth in root eg. Beet

# GONDWANA UNIVERSITY

## GADCHIROLI

### SEMESTER SYSTEM PATTERN SYLLABUS

FOR

**B.Sc. BOTANY**

**B.Sc. Part I**

**SEMESTER – II**

**PRACTICAL**

Based on Theory Papers of Semester-II

[Time 5 hours]

[Marks – 30]

- Que 1 : Identify & classify the given **Pteridophytic** material [A] ( Writing 2 marks, Slide preparation 2 marks) 04 marks
- Que 2 : Identify & classify the given **Gymnospermic** material [B] ( Writing 2 marks, Slide preparation 2 marks) 04 marks
- Que 3 : Explain the vegetative morphology of given **Angiospermic** material [C] 04 marks
- Que 4 : Prepare double stained permanent mount/s of the given **Angiospermic** material [D] and identify giving diagnostic characters ]( Writing 3 marks, Slide preparation 3 marks) 06 marks
- Que 5 : Spotting - Identification 1/2 mark and characters 1/2 mark 06 marks
- E) Pteridophyta
  - F) Paleobotany
  - G) Gymnosperm
  - H) Vegetative Morphology of Angiosperm
  - I) Reproductive Morphology of Angiosperm
  - J) Anatomy
- Que 6 : Practical Record.....02 06 marks
- Excursion Report.....02
- Vice-voce .....02

**Note :** Well labelled diagrams are expected wherever necessary