

**B.Sc., BOTANY SEMESTER-WISE SYLLABUS AND MODEL
QUESTION PAPERS OF THEORY AND PRACTICALS**

(AS PER CBCS AND SEMESTER SYSTEM)

w.e.f. 2015-16

(REVISED IN APRIL, 2016)

**AP STATE COUNCIL OF HIGHER EDUCATION
CBCS - PATTERN FOR BOTANY**

Andhra Pradesh State Council of Higher Education

Structure of B.Sc Botany under CBCS

w.e.f. 2015-16 (Revised in April, 2016)

Year	Semester	Paper	Title	Marks	Credits	
I	I	I	Microbial Diversity , Algae and Fungi	100	03	
			Practical –I	50	02	
	II	II	Diversity Of Archaeogoniatas & Anatomy	100	03	
			Practical –II	50	02	
II	III	III	Plant taxonomy & Embryology	100	03	
			Practical –III	50	02	
	IV	IV	Plant physiology & Metabolism	100	03	
			Practical –IV	50	02	
III	V	V	Cell Biology, Genetics & Plant breeding	100	03	
			Practical –V	50	02	
		VI	VI	Plant Ecology & Phytogeography	100	03
				Practical –VI	50	02
	Any one paper from A, B and C can be selected	VII A	VII A*	Elective	100	03
				Lab	50	02
		VII B*	VII B*	Elective		
				Lab		
		VII C*	VII C*	Elective		
				Lab		
	VI	VIII (I)**	VIII (I)**	Cluster Elective-I	100	03
				100	03	
				100	03	
				50	02	
		VIII (II)**	VIII (II)**	Cluster Elective-II	100	03
				100	03	
100				03		
50				02		
VI	VIII (II)**	VIII (II)**	Cluster Elective-II	100	03	
			100	03		
			100	03		
			50	02		
VI	VIII (II)**	VIII (II)**	Cluster Elective-II	100	03	
			100	03		
			100	03		
			50	02		

***III year Syllabi will be sent shortly

Andhra Pradesh State Council of Higher Education
I B.Sc - SEMESTER- I: BOTANY SYLLABUS
 w.e.f. 2015-16 (Revised in April, 2016)
Paper-DSC IA : Microbial Diversity, Algae and Fungi
Total hours of teaching 60hrs @ 4 hrs per week

UNIT- I: MICROBIAL WORLD (Origin and Evolution of Life, Microbial diversity) (12hrs)

1. Discovery of microorganisms, origin of life, spontaneous, biogenesis, Pasteur experiments, germ theory of disease.
2. Classification of microorganisms – R.H. Whittaker’s five kingdom concept, Carl Woese’s- Domain system.
3. Brief account of special groups of bacteria- Archaeobacteria, Mycoplasma, Chlamydia, Actinomycetes, Rickettsias and Cyanobacteria.

UNIT- II: VIRUSES (12hrs)

1. Viruses- Discovery, general account, structure & replication of –T4 Phage (Lytic, Lysogenic) and TMV, Viroids, Prions.
2. Plant diseases caused by viruses– Symptoms, transmission and control measures (Brief account only).
3. Study of Tobacco Mosaic, Bendi Vein clearing and Papaya leaf curl diseases.

UNIT III: BACTERIA (12hrs)

1. Bacteria: Discovery, General characteristics, cell structure and nutrition.
2. Reproduction- Asexual and bacterial recombination (Conjugation, Transformation, Transduction).
3. Economic importance of Bacteria.

UNIT –IV Algae (12hrs)

1. General account - thallus organization and reproduction in Algae.
2. Fritsch classification of Algae (up to classes only) and economic importance.
3. Structure, reproduction and life history of *Oedogonium*, *Ectocarpus* and *Polysiphonia*.

UNIT V: FUNGI (12hrs)

1. General characteristics and outline classification (Ainsworth).
2. Structure, reproduction and life history of *Rhizopus* (Zygomycota), *Penicillium* (Ascomycota), and *Puccinia* (Basidiomycota).
3. Lichens-Structure and reproduction; ecological and economic importance.

Suggested activity: Seminar, Quiz, debate, collection of diseased plant parts –studying symptoms and identification of pathogen, collection and study of fresh and marine Algae available in local area.

Books for Reference:

1. Oladele Ogunseitan (2008) Microbial Diversity: Form and Function in Prokaryotes
Wiley- Blackwell.
2. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata Mc Graw-Hill Co, New Delhi.
3. Prescott, L. Harley, J. and Klein, D. (2005) Microbiology, 6th edition, Tata Mc
Graw- Hill Co. New Delhi.
4. Fritsch F.E. (1935 The Structure & Reproduction of Algae 1945): Cambridge
University Press Cambridge, U.K. Vol. I, Vol. II.
5. Smith, G.M (1955) :Cryptogamic Botany(Vol. I Algae, Fungi, & Lichens)
McGraw-Hill Book Co., New York .
6. Ian Morris (1967): An Introduction to the Algae, Hutchinson, London.
7. Alexopoulos,C.J., Mims, C.W. & Blackwell, M. (1996): Introductory Mycology
John Wiley& Sons., Inc., N.Y., Chicester, Berisbane, Toronto, Singapore.
8. Webster, J (1999) : Introduction to Fungi(2nd edition) Cambridge University Press.

****Student Activities like Seminars, Assignments, Fieldwork, Study Projects, Models etc. are Part of Curriculum for all units in all papers.**

I B.Sc – SEMESTER –I: BOTANY PRACTICAL SYLLABUS

Paper-DSC IA: Microbial Diversity, Algae and Fungi

Total hours of laboratory Exercises 30 hrs @ 2 per week

1. Knowledge of Equipment used in Microbiology: Spirit lamp, Inoculation loop, Hot-air oven, Autoclave/Pressure cooker, laminar air flow chamber and Incubator.
 2. Preparation of liquid and solid media for culturing of microbes (Demonstration).
 3. Study of viruses and bacteria using electron photo micrographs (TMV, Bacteriophage, HIV, Cocci, Bacillus, Spirillum bacteria).
 4. Gram staining technique.
 5. Study of Plant disease symptoms caused by Bacteria (Citrus canker, leaf blight of rice, Angular leaf spot of Cotton) and viruses (TMV, Bhendi vein clearing and Leaf curl of Papaya),Fungi (Late blight of potato, Red rot of Sugarcane and Paddy blast).
 6. Study of vegetative and reproductive structures of the following :
 - a) **Cyanobacteria:** *Nostoc and Scytonema*.
 - b) Algae: *Oedogonium, Ectocarpus, Polysiphonia*,
 - c) Fungi: *Rhizopus, Penicillium and Puccinia* .
 7. Study of plant materialinfected by Fungi (Rot of tomatoes,blue and greenmoulds of Ciitrus fruits and wheat rust(Section cutting of diseased parts of Wheat and Barberry -identification of different spores).
 8. Lichens: Morphology and of anatomy of different thalli.
 9. Field Visit.
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B.Sc - SEMESTER –I
BOTANY PRACTICAL PAPER –I
Paper-1 P: Microbial Diversity, Algae and Fungi

Time: 3hrs.

Max. Marks: 50

1. Identify giving reasons two of the given **Algal mixture** "A". Leave your preparation for evaluation. Draw labeled diagrams. (Slide--1mark, Diagrams--1mark, Identification--1mark)
3x 2 = 6 Marks

2. Make suitable stained preparation of the **material "B"** to bring out the details of internal structure-- identify giving reasons. Draw labeled diagrams and leave your preparations for evaluation. (Slide-4 marks, diagrams-3 marks, Identification-3marks)
10 Marks

3. Perform Gram staining of the given Bacterial culture 9 Marks

4. Write critical notes and Identify D, E, F, G and H (5X3)= 15 Marks

5. Record(submission is compulsory) 10 Marks

Total: 50 Marks

Key:

- A. Algal material
- B. Fungi material
- C. Bacterial culture
- D. One of the instruments of Micro biology laboratory.
- E. Whole specimen or a permanent slide of Algae.
- F. Whole specimen or a permanent slide of Fungi.
- G. Whole specimen or a permanent slide of Plant disease studied.
- H. Whole specimen or a permanent slide of Lichens.

I B. Sc - SEMESTER- II: BOTANY THEORY SYLLABUS
Paper –DSC IB : Diversity of Archaeogniates & Plant Anatomy
Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: BRYOPHYTES

(12hrs)

1. Bryophytes: General characters, Classification (up to classes)
2. Structure, reproduction and Life history of *Marchantia*, and *Funaria*.
3. Evolution of Sporophyte in Bryophytes.

UNIT - II: PTERIDOPHYTES

(12hrs)

1. Pteridophytes: General characters, classification (up to Classes)
2. Structure, reproduction and life history of *Lycopodium*, and *Marsilea*.
3. Heterospory and seed habit.
4. Evolution of stele in Pteridophytes.

UNIT – III: GYMNOSPERMS

(12hrs)

1. Gymnosperms: General characters, classification (up to classes)
2. Morphology, anatomy, reproduction and life history of *Pinus* and *Gnetum*
3. Economic importance with reference to wood, essential oils and drugs

UNIT –I V: Tissues and Tissue systems

(12hrs)

1. Meristems - Root and Shoot apical meristems and their histological organization.
2. Tissues – Meristematic and permanent tissues (simple, complex, secretory)
3. Tissue systems–Epidermal, ground and vascular.

UNIT – V. Secondary growth

(12hrs)

1. Anomalous secondary growth in *Achyranthes*, *Boerhaavia* and *Dracaena*.
2. Study of local timbers of economic importance-Teak, Rosewood, Red sanders and Arjun (Tella maddi).

Suggested activity: Collection of *Marsilea* sporocarp, *Pinus* needles, male and female cones, study of *Pinus* pollen grains, collection of locally available economically useful timbers.

Books for Reference:

1. Cavers, Frank (): The inter-relationships of the Bryophytes
New Phytologist, Indian Reprint.
2. Smith, G.M. (1955): Cryptogamic Botany Vol. II. (2nd Edition)
(Bryophytes & Pteridophytes) Tata McGraw Hill Publishing Co., New Delhi.
3. Parihar, N.S. (): An Introduction to embryophyta – Vol.II. Bryophyta
Central Book Depot, Allahabad.
4. Watson, E.V. (1968): British Mosses & Liverworts Cambridge University Press, U.K
5. Eames, A.J. (1936) : Morphology of Vascular Plants (Lower Groups)
McGraw Hill, N.Y.
6. Parihar, N.S. (19) : An Introduction to Embryophyta Vol.II Pteridophyta
Central Book Depot., Allahabad.
7. Smith, G.M. (1955) : Cryptogamic Botany Vol.II (2nd Edn.,) (Bryophytes &
Pteridophytes) Tata McGraw Hill Publishing Co., New Delhi.
8. Sporne, K.R. (1970) : The Morphology of Pteridophytes (The Structure of
Ferns and Allied Plants) Hutchinson University Library, London
9. Bierhorst, D.W. (1971) : Morphology of Vascular Plants, The MacMillan Co.,
N.Y. & Collier- MacMillan Ltd., London.
10. Coulter, J.M.& C.J. Chamberlain (1964) : Morphology of Gymnosperms
Central Book Depot, Allahabad.
11. Sporne, K.R. (1971): The Morphology of Gymnosperms (The Structure and
Evolution of Primitive seed Plants) Hutchinson University Library, London.
12. Esau, K. (1965) : Vascular Differentiation in Plants. Holt, Rinehart & Winston,
N.Y., Chicago, San Fransisco, Toronto, London.
13. Eames, A.J., & Mc Daniels, L.H.(1979) : An Introduction to Plant anatomy
Tata-McGraw-Hill Publishing Co., (P) Ltd. Bombay, New Delhi.
14. Esau. K.(1980) : Plant Anatomy, (2nd Edition) Wiley Eastern Ltd., New Delhi.

I B.Sc SEMESTER -II
BOTANY PRACTICAL SYLLABUS
Paper-DSC IB: Diversity of Archaeogoniates & Plant Anatomy
Total hours of laboratory Exercises 30 hrs @ 2 per week

1. Morphology (vegetative and reproductive structures) , anatomy of the following :
Marchantia, Funaria, Lycopodium and *Pinus*.
2. Anatomy:
 - a) Demonstration of double staining technique.
 - b) Tissue organization in root and shoot apices using permanent slides
 - c) Preparation of double staining slides
 - d) Anomalous secondary structure of *Achyranthes, Boerhavia* and *Dracaena*.
 - e) Anatomical study of wood in T.S., T.L.S. and R.L.S.
3. Field visits to local timber depots.

I B.Sc., SEMESTER –II: BOTANY PRACTICAL MODEL PAPER II
IIP: Diversity of Archaeogniates & plant Anatomy

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|---|---------------|
| 1. Section cutting of material -A
(Slide 3 marks, diagrams-3 marks, Identification-3 marks) | 9 Marks |
| 2. Section cutting of material -B
(Slide 3 marks, diagrams-3 marks, Identification-3 marks) | 9 Marks |
| 3. Section cutting of material -C
(Slide 4 marks, diagrams-3 marks, Identification-3 marks) | 10 Marks |
| 4. Identification of spotters -D, E, and F | 3x4 =12 marks |
| 5. Record (submission compulsory) | 10 marks |

Total : 50 Marks

Key:

- A. Bryophyta/ Pteridophyta material
 - B. Gymnosperm material.
 - C. Anatomy material.
 - D. Whole specimen or permanent slide of Bryophyta/ Pteridophyta
 - E. Whole specimen or permanent slide of Gymnosperm.
 - F. Whole specimen or permanent slide of wood.
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II B. Sc - SEMESTER –III: BOTANY THEORY PAPER –III
(Paper-DSC IIA : Plant Taxonomy and Embryology)
Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: INTRODUCTION TO PLANT TAXONOMY

(12hrs)

1. Fundamental components of taxonomy (identification, nomenclature, classification)
2. Taxonomic resources: Herbarium- functions & important herbaria, Botanical gardens, Flora, Keys- single access and multi-access.
3. Botanical Nomenclature- Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, author citation, valid-publication).

UNIT – II: CLASSIFICATION

(12 hrs)

1. Types of classification- Artificial, Natural and Phylogenetic.
2. Bentham & Hooker's system of classification- merits and demerits.
3. Engler & Prantle's system of classification- merits and demerits
4. Phylogeny – origin and evolution of Angiosperms

UNIT –III: SYSTEMATIC TAXONOMY-I

(12hrs)

1. Systematic study and economic importance of the following families:
Annonaceae, Brassicaceae, Rutaceae, Curcubitaceae, and Apiaceae.

UNIT –IV: SYSTEMATIC TAXONOMY-II

(12hrs)

1. Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Ephorbiaceae, Arecaceae, and Poaceae.

UNIT – V: EMBRYOLOGY

(12hrs)

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types; Megasporogenesis, development of Monosporic, Bisporic and Tetrasporic types (*Peperomia*, *Drusa*, *Adoxa*) of embryo sacs.
3. Pollination and Fertilization (out lines) Endosperm development and types.
4. Development of Dicot and Monocot embryos, Polyembryony.

Suggested activity: Collection of locally available plants of medicinal importance, observing pollen grains in honey, Aero palynology-collection of pollen from air using glycerin strips in different seasons.

Books for Reference:

1. Porter, C.L. (): Taxonomy of flowering Plants, Eurasia Publishing House, New Delhi.
2. Lawrence, G.H.M. (1953): Taxonomy of Vascular Plants, Oxford & IBH Publishers, New Delhi, Calcutta.
3. Jefferey, C.(1968) : An Introduction to Plant Taxonomy J.A. Churchill, London.
4. Mathur, R.C.(1970) : Systematic Botany (Angiosperms) Agra Book Stores- Lucknow, Ajmer, Allahabad, Delhi.
5. Maheswari,P(1963) :Recent Advances in the Embryology of Angiosperms(Ed.,) International Society of Plant Morphologists- University of Delhi.
6. Swamy. B.G.L. & Krishnamoorthy. K.V.(1980):From flower to fruit Tata McGraw Hill Publishing Co., Ltd., New Delhi.
6. Maheswari, P.(1985):An Introduction to the Embryology of Angiosperms Tata McGraw Hill Publishing Co.,Ltd., New Delhi.
8. Bhojwani, S.S. & Bhatnagar, S.P. (2000) : The Embryology of Angiosperms (4th Edition) Vikas Publishing House(P)Ltd., UBS Publisher's Distributors, New Delhi.

II B.Sc - SEMESTER-III
BOTANY PRACTICAL – DSC IIA
Plant Taxonomy and Embryology
Total hours of laboratory Exercises 30hrs @ 2 per week

Suggested Laboratory Exercises:

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus.
 2. Demonstration of herbarium techniques.
 3. Structure of pollen grains using whole mounts (*Catharanthus, Hibiscus, Acacia, Grass*).
 4. Demonstration of Pollen viability test using *in-vitro* germination (*Catharanthus*).
 5. Study of ovule types and developmental stages of embryo sac using permanent slides /Photographs.
 6. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides / Photographs
 7. Isolation and mounting of embryo (using *Symopsis / Senna / Crotalaria*)
 8. Field visits .
 9. Study of local flora and submission of Field Note Book.
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II B.Sc., BOTANY- SEMESTER -III
PRACTICAL MODEL PAPER III Plant Taxonomy and Embryology

1. Describe the given Plant specimens (A & B) in technical terms. Draw neat labeled diagrams of twig with inflorescence, L.S. of Flower, T.s. of Ovary and floral Diagram. Give floral formula. Identify the family.

2x 10 = 20 Marks

(Description- vegetative - 2 marks, floral – 4 marks; diagrams-3 marks, Identification-1 marks)

2. Derive the plant specimens C & D to their respective families- 2x4 = 08 marks
3. Identification of spotters -D, E ,and F (Embryology) 3x4 =12 marks
4. Record & Herbarium (submission compulsory) 10 marks

Total : 50 Marks

II B. Sc - SEMESTER- IV THEORY: BOTANY SYLLABUS
PAPER – DSC IIB: Plant Physiology and Metabolism
Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: Plant – Water relations (12 hrs)

1. Physical properties of water, Importance of water to plant life.
2. Diffusion, imbibition and osmosis; concept & components of Water potential.
3. Absorption and transport of water and ascent of sap.
4. Transpiration –Definition, types of transpiration, structure and opening and closing mechanism of stomata.

UNIT –II: Mineral nutrition & Enzymes (12hrs)

1. Mineral Nutrition: Essential elements (macro and micronutrients) and their role in plant metabolism, deficiency symptoms.
2. Mineral ion uptake (active and passive transport).
3. Nitrogen metabolism- biological nitrogen fixation in *Rhizobium*, outlines of protein synthesis (transcription and translation).
4. Enzymes: General characteristics, mechanism of enzyme action and factors regulating enzyme action.

UNIT –III: PHOTOSYNTHESIS (12 hrs)

1. Photosynthesis: Photosynthetic pigments, photosynthetic light reactions, photo-phosphorylation, carbon assimilation pathways: C₃, C₄, and CAM (brief account)
2. Photorespiration and its significance.
3. Translocation of organic solutes: mechanism of phloem transport, source-sink relationships.

UNIT – IV: PLANT METABOLISM (12 hrs)

1. Respiration: Glycolysis, anaerobic respiration, TCA cycle, electron transport system. Mechanism of oxidative phosphorylation.
2. Lipid Metabolism: Types of lipids, Beta-oxidation.

UNIT –V: GROWTH AND DEVELOPMENT (12hrs)

1. Growth and development: definition, phases and kinetics of growth.
2. Physiological effects of phytohormones - Auxins, Gibberellins, Cytokinins, ABA, Ethylene and Brassinosteroids.
3. Physiology of flowering -photoperiodism, role of phytochrome in flowering; Vernalization.
4. Physiology of Senescence and Ageing.

Suggested activity: Seminars, Quiz, Debate, Question and Answer sessions, observing animations of protein biosynthesis in you tube.

Books for Reference:

1. Steward. F.C (1964): Plants at Work (A summary of Plant Physiology) Addison-Wesley Publishing Co., Inc. Reading, Massachusetts, Palo alto, London.
2. Devlin, R.M. (1969) : Plant Physiology, Holt, Rinehart & Winston & Affiliated East West Press (P) Ltd., New Delhi .
3. Noggle, R.& Fritz (1989):Introductory Plant Physiology Prentice Hall of India.
4. Lawlor.D.W. (1989): Photosynthesis, metabolism, Control & Physiology ELBS/Longmans-London.
5. Mayer, Anderson & Bonning(1965): Introduction to Plant Physiology D.Van Nostrand . Publishing Co., N.Y.
6. Mukherjee, S. A.K. Ghosh(1998) Plant Physiology ,Tata McGraw Hill Publishers(P) Ltd., New Delhi.
7. Salisbury, F.B & C.W. Ross (1999): Plant Physiology CBS Publishers and Printers, New Delhi.
7. Plummer, D.(1989) Biochemistry–the Chemistry of life ,McGraw Hill Book Co., London, N.Y. New Delhi, Paris, Singapore, Tokyo.
9. Day, P.M.& Harborne, J.B. (Eds.,) (2000): Plant Biochemistry. . Harcourt Asia (P) Ltd., India & Academic Press, Singapore.

II B. Sc SEMESTRE- IV. – BOTANY PRACTICAL SYLLABUS
PAPER- DSC IIB - Plant Physiology and Metabolism)
Total hours of laboratory Exercises 30 hrs @ 2 per week

Suggested Laboratory Exercises:

1. Osmosis – by potato osmoscope experiment
2. Determination of osmotic potential of plant cell sap by plasmolytic method using leaves of *Rhoeo / Tradescantia*.
3. Structure of stomata (dicot & monocot)
4. Determination of rate of transpiration using cobalt chloride method.
5. Demonstration of transpiration by Ganong's photometer
6. Demonstration of ascent of sap/Transpiration pull.
6. Effect of Temperature on membrane permeability by colorimetric method.
7. Study of mineral deficiency symptoms using plant material/photographs.
8. Separation of chloroplast pigments using paper chromatography technique.
9. Rate of photosynthesis under varying CO₂ concentrations.
10. Effect of light intensity on oxygen evolution in photosynthesis using Wilmott's bubbler.

II B. Sc – SEMESTRE- IV. BOTANY PRACTICAL MODEL PAPER
(PAPER- IV - Plant Physiology and Metabolism)

1. Perform the Experiments A & B. Give the aim, principle, procedure and observation. Tabulate the results if any. Draw labeled diagram. 2 x 15 = 30 marks

 2. Give the protocol of the experiments C & D 2 x 5 = 10 marks

 3. Record & Viva 10 marks
- 50 marks
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A.P. State Council of Higher Education
Revised Common Framework of CBCS for Colleges in Andhra Pradesh
w.e.f. 2015-16, Revised in April, 2016

Table-7: B.Sc., SEMESTER – I

Sno	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation Course - 1</i> Human Values & Professional Ethics	50	0	50	2	2
4	<i>Foundation course -2</i> Environmental Studies	50	0	50	2	2
5	DSC-1 Paper-1 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-1 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-1 (Core)	100	25	75	4	3
10	DSC 3 A Lab Practical	50	0	50	2	2
	Total	750	-	-	30	25

#DSC: Domain (Subject) Specific Course (Paper)

Foundation Course: value or skill based

Note: For Science Domain Subjects which had no lab practical component earlier (eg. Mathematics) the following format is applicable. They, however, will have co-curricular activities (eg. Problem solving sessions etc.). The total marks will change accordingly for such combinations. For example for Maths, Physics and Chemistry the total marks will be 700.

	DSC (without Lab Practical)	100	25	75	6	5
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*Mid sem exam at the college (The marks split between Formal Test and Co-curricular activities may be decided by the University concerned). End Sem Exam by the Univ.

*Practical component will not be applicable to those science subjects which had no such component earlier (ex. Mathematics)

**Syllabus size shall be in accordance with the number of teaching hours

Table-8: B.Sc., SEMESTER – II

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation course – 3</i> ICT – I	50	0	50	2	2
4	<i>Foundation course – 4</i> CSS – I	50	0	50	2	2
5	DSC 1 Paper-2 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-2 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-2 (Core)	100	25	75	4	3
10	DSC 3 Lab Practical	50	0	50	2	2
	Total	750	-	-	30	25

B.Sc. Table-9: B.Sc., SEMESTER – III

SEMESTER – III

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	First Language (Tel/Hin/Urdu/Sans...)	100	25	75	4	3
2	Second Language English	100	25	75	4	3
3	<i>Foundation Course - 5</i> ICT – II	50	0	50	2	2
4	<i>Foundation course – 6</i> CSS – II	50	0	50	2	2
5	DSC 1 Paper-3 (Core)	100	25	75	4	3
6	DSC 1 Practical	50	0	50	2	2
7	DSC 2 Paper-3 (Core)	100	25	75	4	3
8	DSC 2 Practical	50	0	50	2	2
9	DSC 3 Paper-3 (Core)	100	25	75	4	3
10	DSC 3 Practical	50	0	50	2	2
	Total	750	-	-	30	25

Table-10: B.Sc., SEMESTER – IV**SEMESTER – IV**

Sno	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours**	Credits
1	<i>Foundation Course – 7</i> CSS – 2	50	0	50	2	2
2	<i>Foundation Course – 8</i> Analytical Skills	50	0	50	2	2
3	<i>Foundation Course - 9</i> Entrepreneurship	50	0	50	2	2
4	<i>Foundation course – 10</i> Leadership Education	50	0	50	2	2
5	DSC 1 Paper-4 (Core)	100	25	75	4	3
6	DSC 1 Lab Practical	50	0	50	2	2
7	DSC 2 Paper-4 (Core)	100	25	75	4	3
8	DSC 2 Lab Practical	50	0	50	2	2
9	DSC 3 Paper-4 (Core)	100	25	75	4	3
10	DSC 3 Lab Practical	50	0	50	2	2
	Total	750	-	-	30	23

*Analytical Skills: To be taught by Maths/Stat Teachers (may be partly by English Teachers)

Entrepreneurship: To be taught by Commerce Teachers

Leadership Education: To be taught by Telugu Teachers

Table-11: B.Sc., SEMESTER – V

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	DSC 1 Paper-5 (Core)	100	25	75	3	3
2	DSC 1 Lab Practical	50	0	50	2	2
3	DSC 2 Paper-5 (Core)	100	25	75	3	3
4	DSC 2 Lab Practical	50	0	50	2	2
5	DSC 3 Paper-5 (Core)	100	25	75	3	3
6	DSC 3 Lab Practical	50	0	50	2	2
7	DSC 1 Paper-6 (Core)	100	25	75	3	3
8	DSC 1 Lab Practical	50	0	50	2	2
9	DSC 2 Paper -6 (Core)	100	25	75	3	3
10	DSC 2 Lab Practical	50	0	50	2	2
11	DSC 3 Paper-6 (Core)	100	25	75	3	3
12	DSC 3 Lab Practical	50	0	50	2	2
	Total	900	-	-	30	30

Table-12: B.Sc., SEMESTER – VI

Sno	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	Elective 1: DSC 1, Paper -7 (applied/adv)	100	25	75	3	3
2	Elective-1 Lab Practical	50	0	50	2	2
3	Elective-1: DSC 2, Paper -7 (applied/adv)	100	25	75	3	3
4	Elective-2 Lab Practical	50	0	50	2	2
5	Elective-1: DSC 3, Paper -7 (applied/adv)	100	25	75	3	3
6	Elective-3 Lab Practical	50	0	50	2	2
7	Elective -2: DSC 1, Paper -8 App/Inter-domain/Gen EI	100	25	75	3	3
8	Elective-2 Lab Practical	50	0	50	2	2
9	Elective -2: DSC 2, Paper -8 App/Inter-domain/Gen EI	100	25	75	3	3
10	Elective-2 Lab Practical	50	0	50	2	2
11	Elective -2: DSC 3, Paper -8 App/Inter-domain/Gen EI	100	25	75	3	3
12	Elective-2 Lab Practical	50	0	50	2	2
	Total	900	-	-	30	30

*7th paper of each of the domain specific subjects (1st paper of semester VI) will be a domain related Elective. More than one Elective may be offered giving choice to students. The Electives may be of Domain specific applied or advanced (specialization) in nature. The number of Electives may be decided (along with the syllabus) by the University concerned keeping the feasibility of conduct of University examinations in view.

** Applied Elective: It is desirable that around 25% of syllabus is taught by field experts. The college has to make such an arrangement.

*8th paper of each of the domain specific subjects (2nd paper of semester VI) will also be an Elective. The Electives may be of Inter-domain Clusters**- each Cluster having three papers with or without project work. or General in nature. The number of Clusters may be decided (along with the syllabus) by the University

concerned keeping the feasibility of conduct of University examinations in view. It is desirable that around 25% of syllabus is taught by field experts.

****Cluster:** *In the last semester, for paper-8, each domain subject has one elective totaling three papers for each student. Electives may be given as Clusters of three papers each for each subject. A student can opt for all the three papers of the same subject (cluster or stream) including or excluding project work for a wider learning experience. The student will not study the other two domain subjects for paper-8.*

Total Credits for a B.Sc. Course: 158