KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE - 641 029
B.Sc., BOTANY
Curriculum & Scheme of Examination under CBCS
(APPLICABLE TO STUDENTS ADMITTED FROM THE ACADEMIC YEAR (2016-2017)

Semester	Part	Subject code	Title of the Paper	Instruction Hours / Cycle	Exam. Marks			Duration of Exam.(hours)	Credit
					CIA	ESE	Total		
I	I	**16TML101**	**Part-I -Lang -Tamil–I** /Hindi–I /French –I / Malayalam – I / Sanskrit - I	6	25	75	**100**	3	**3**
	II	**15ENG101**	**Part – II** - English - I	6	25	75	**100**	3	**3**
	III	**16UBO101**	**C.P.1-** Biodiversity-I (Bacteria, Virus, Algae, Fungi, Lichens & Plant Pathology)	7	25	75	**100**	3	**4**
		15UZO1A1	**Allied -1** Zoology – I	5	20	55	**75**	3	**4**
			C.Pr.1 - Plant Diversity – I	2	-	-	-	-	-
			Allied Pr. Zoology – 1	2	-	-	-	-	-
	IV	**15EVS101**	Environmental studies**	2	-	50	**50**	3	**2**
II	I	**15TML202**	**Part – I- Tamil–II** /Hindi–II /French–II / Malayalam-II / Sanskrit - II	6	25	75	**100**	3	**3**
	II	**15ENG202**	**Part- II-** English - II	6	25	75	**100**	3	**3**
	III	**16UBO202**	**C.P.2**-Plant Diversity-II (Bryophytes, Pteridophytes, Gymnosperms & Paleobotany)	7	25	75	**100**	3	**4**
		15UZO2A2	**Allied - 2** Zoology - 2	5	20	55	**75**	3	**4**
		16UBO2CL	**C.Pr.1** - Biodiversity – 1 & II	2	40	60	**100**	3	**2**
		16UZO2AL	**Allied. Pr.** Zoology	2	20	30	**50**	3	**2**
	IV	**15VED201**	Value Education - Moral and Ethics**	2	-	50	**50**	3	**2**
III	I	**15TML303**	**Part–I–Tamil–III** /Hindi- III / French- III / Malayalam – III / Sanskrit - III	6	25	75	**100**	3	**3**
	II	**15ENG303**	**Part – II -Lang** – English - III	6	25	75	**100**	3	**3**
	III	**15UBO303**	**C.P. 3** - Anatomy and Embryology of Angiosperms.	5	25	75	**100**	3	**4**
		15UCH3A3	**Allied – 3 –** Chemistry - 1	5	20	55	**75**	3	**4**
			C. Pr. 2 - Anatomy and Embryology of Angiosperms	2	-	-	-	-	-
			Allied – Pr. – Chemistry	2	-	-	-	-	-
	IV	**15UGA3S1**	Skill based subject –I General awareness	2	25	75	**100**	3	**3**
		16TBT301/ 16TAT301/ 16UHR3N1	Basic Tamil* / Advanced Tamil**/ Non Major Elective – Human Rights**	2	-	75	**75**	3	**2**
IV	I	**16TML404**	**Part-I–Tamil–IV** / Hindi-IV / French - IV/ Malayalam – IV / Sanskrit - IV	6	25	75	**100**	3	**3**

	II	**16ENG404**	**Part-– II -Lang** – English IV	6	25	75	**100**	3	**3**
	III III	**15UBO404**	**C.P.4**- Biostatistics and Biophysics	5	25	75	**100**	3	**4**
		15UCH4A4	**Allied 4** – Chemistry - 2	5	20	55	**75**	3	**4**
		15UBO4CM	**C. Pr. 2** – Anatomy & Embryology / Biostatistics & Biophysics	2	40	60	**100**	3	**2**
		15UCH4AL	**Allied Pr.** Chemistry.	2	20	30	**50**	3	**2**
	IV	**15UBO4S2**	Skill based subject-II Plant Tissue culture concept and applications	2	25	75	**100**	3	**3**
	IV	**16TBT401/** **16TAT402** **16UWR4N2**	Basic Tamil*/ Advanced Tamil**/ Non Major Elective – Women Rights**	2	-	75	**75**	3	**2**
V	III	**16UBO505**	**C.P. 5 –** Fundamentals of Computer and Bioinformatics	4	25	75	**100**	3	**4**
		15UBO506	**C.P. 6** - Taxonomy of Angiosperms & Economic Botany	5	25	75	**100**	3	**5**
		15UBO507	**C.P.7** - Cytology, Genetics and Plant Breeding.	4	25	75	**100**	3	**5**
		16UBO508	**C.P. 8** - Plant Ecology, Phytogeography and Resource Conservation	4	25	75	**100**	3	**5**
		16UBO5E1	**Elective – I**	3	25	75	**100**	3	**5**
		15UBO5CN	**C.Pr.3** – Fundamentals of Computer and Bioinformatics	4	40	60	**100**	3	**2**
			C.Pr. 4 - Taxonomy of Angiosperms, Economic Botany, Cytology, Genetics and Plant Breeding, Plant Ecology, Plant Geography and Resource Conservation	4	-	-	**-**	-	**-**
	IV	**16UZO/UBC/** **UBT5X1**	EDC – Extra Departmental course	2	25	75	**100**	3	**3**
		15UBO5IT	Internship Training	**Grade******					
VI	III	**15UBO609**	**C.P.9** - Horticulture	5	25	75	**100**	3	**5**
		16UBO610	**C.P.10**- Biochemistry	5	25	75	**100**	3	**5**
		15UBO611	**C.P.11**- Plant Physiology	5	25	75	**100**	3	**5**
		15UBO6CO	**C.Pr. 4**- Taxonomy of Angiosperms, Economic Botany, Cytology, Genetics and Plant Breeding, Plant Ecology, Plant Geography and Resource Conservation		40	60	**100**	3	**2**
		16UBO6CP	**C. Pr. 5** – Horticulture, Biochemistry and Plant physiology	4	40	60	**100**	3	**2**
		16UBO6E2	**Elective- II**	5	25	75	**100**	3	**5**
		15UBO6Z1	Project***	4	20	80	**100**	-	**5**
		15UBO6S4	**Skill based Subject-IV-** Cultivation and Marketing of Medicinal plants	2	25	75	**100**	3	**3**
		15NCC/NSS/ **YRC/PYE101**	Extension activity *	-	50	-	**50**	-	**1**

@ Hindi/Malayalam/ French/ Sanskrit – 13HIN/MLM/FRN/SAN101 - 202
***** - No End-of-Semester Examinations. Only Continuous Internal Assessment (CIA)

******- No Continuous Internal Assessment (CIA). Only End-of-Semester Examinations (ESE)

***- Project Report – 60 marks; Viva-voce – 20 marks; Internal – 20 marks
****The students shall undergo an Internship training/field work for a minimum period of 2 weeks at the end of the fourth semester during summer vacation and submit the report in the fifth semester. The report will be evaluated for 100 marks along with the internal viva voce by the respective Faculty. According to their marks, the grades will be awarded as given below.

Marks %	Grade
85-100	O
70-84	D
60-69	A
50-59	B
40-49	C
<40	U (Reappear)

Major Elective Papers

(2 papers are to be chosen from the following 6 papers)

1. **Forestry**
2. **Medicinal plants**
3. **Food science**
4. **Seed biology**
5. **Biotechnology**
6. **Pharmacognosy**

Non-Major Elective Papers

1. **Human Rights**
2. **Women's Rights**

List of Extra Departmental Course (EDC) papers

S.No.	Subject code	Title of the paper	Offering Department
1.	16UZO5X1	Ornamental Fishery Technology	Zoology
2.	16UBC5X1	Diagnostic Biochemistry	Biochemistry
3.	16UBT5X1	Molecular Diagnostics	Biotechnology

Note: In core/allied subjects, No. of papers both theory and practical are included wherever applicable. However, the total credits and marks for core/allied subjects remain the same as stated below.

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil/Hindi/Malayalam/ French/ Sanskrit	400	12
2.	II	English	400	12
3.	III	Core – Theory/Practical/Project	1700	65
		Allied	400	20
		Electives	200	10
4.	IV	Basic Tamil / Advanced Tamil (OR) Non-major elective	150	4
		Skill Based subject	300	9
		Environmental Studies	50	2
		Value Education	50	2
5.	V	Extra Departmental Course (EDC)	100	3
		Extension Activities	50	1
		Total	**3800**	**140**

Note :

CBCS – Choice Based Credit system
CIA – Continuous Internal Assessment
ESE – End of Semester Examinations

25 % CIA is applicable to all theory subjects except JOC, COP and Diploma Courses, which are considered as extra credit courses.

UBO-1

SEMESTER I **16UBO101**

C.P.1- BIODIVERSITY – I

(Bacteria, Virus, Algae, Fungi, Lichens and Plant Pathology)

Objectives

- To study the pathogenic microorganisms causing various plant diseases.
- To know the primitive plants of the earth.
- To know the classification of algae based on the pigment system in plants.

Total hours: 75 **Credits**: 4

UNIT I **(15 HOURS)**

Microbiology – **Bacteria** - Classification, Morphology, Ultrastructure and Economic importance - **Virus** - Morphology and general characteristics of plant viruses.

UNIT II **(15 HOURS)**

Algae - General characters of Algae. Outline classification (Fritsch, 1945). Detailed study of occurrence, thallus structure, reproduction and life cycle of Cyanophyceae – *Nostoc*, Chlorophyceae – *Volvox, Caulerpa*.

UNIT III **(15 HOURS)**

Occurrence thallus structure and reproduction of Bacilleriophyceae – Diatoms. Occurrence, thallus structure, reproduction and life cycle of Phaeophyceae - *Sargassum,* Rhodophyceae – *Polysiphonia.* Economic importance of Algae.

UNIT IV **(15 HOURS)**

Fungi -General characters of the fungi. Outline classification (Alexopoulos and Mims, 1979) Detailed study of occurrence, structure, reproduction and life cycle of *Albugo, Rhizopus, Saccharomyces, Penicillium* and *Lycoperdon.* Economic importance of fungi.

UNIT V **(15 HOURS)**

Lichens: Phycobionts and mycobionts. Morphology, anatomy of thallus and reproduction of Ascolichen. Economic importance of Lichen. **Pathology –** Introduction, definition and classification of diseases. Symptoms, Causative organisms and Control measures of Tobacco Mosaic Virus diseases, Tikka disease of groundnut and Citrus canker.

TEXTBOOKS

1. Gangulee, Das & Kar. 2001. College Botany Vol. II. New central Book agency Pvt. Ltd., Calcutta.
2. Sharma,O.P.2002.Text book of Fungi.Tata McGraw-Hill Publications,New Delhi.
3. Michael. J. Pelczar, J.R, E.C.S. Chan, Noel R. Krieg and Merna Foss Pelczar Microbiology 1993.Tata McGraw–Hill Publishing Company Limited. New Delhi.

REFERENCES

1. Smith, G.M. 1955. Cryptogamic Botany. Alage and Fungi Vol. I M. Vadamalai media Pvt. Ltd. Bangalore
2. Alexopoulos C.J & Mims – 1979. Introductory Mycology.
3. Vashishta, B.R. 1998. Fungi. S. Chand & Co., New Delhi.
4. Vashishta, B.R. 1998. The Algae. S. Chand & Co., New Delhi.
5. Chopra, C.L. 1982. Algae. S. Nagin & Co., New Delhi.
6. Fritsch, F.E- 1972. The structure and reproduction of Algae Vol. I & II.
7. Watson.1974. Structure and life cycle of Bryophytes. B.I. Publications, New Delhi.
8. Sharma, O.P. 1986. Text book of Algae. Tata Mc Graw – Hill Publications, New Delhi

UBO-2

SEMESTER II **16UBO202**

C.P.2 - BIODIVERSITY-II

(Bryophytes, Pteriodophytes, Gymnosperms, and Paleobotany)

Objectives:

- To understand the life cycle patterns of Bryophtyes, Pteridophytes and Gymnosperm
- To study the dead remains of the plants in the division of Paleobotany.

Total hours: 75 **Credits**: 4

UNIT I **(15 HOURS)**

Bryophytes: Classification of Bryophytes (K.R. Sporne). Occurrence, Structure, Reproduction and Life cycle of *Marchantia*, Anthoceros* and Funaria** - Economic importance of Bryophytes.

UNIT II **(15 HOURS)**

Pteriodophytes: Classification of Pteriodophytes (Riemer). Occurrence, Structure, Reproduction and Life cycle of *Lycopodium*, Selaginella** and *Equisetum**.

UNIT III **(15 HOURS)**

Occurrence, Structure, Reproduction and Life cycle of *Ophioglossum** and *Adiantum**. Stelar variation. Apogamy and Apospory. Economic importance of Pteridophytes.

UNIT IV **(15 HOURS)**

Gymnosperms: Classification of Gymnosperms (K.R. Sporne). Detailed study of the structure and reproduction of *Cycas** and *Gnetum**. Economic importance of Gymnosperms.

UNIT V **(15 HOURS)**

Paleobotany: Geological time scale, Fossilization and kinds of fossils. Radiocarbon dating. Study of the following fossils. *Rhynia*, *Lepidodendron*, *Lepidocarpon* and *Williamsonia*.

***(Developmental studies are excluded)**

TEXTBOOKS

1. Gangulee, Das & Kar. 2001. College Botany Vol II. New central Book agency Pvt. Ltd. Calcutta.
2. Vashista, P.C. 1992. Pteriodophyta. Chand & Co., New Delhi.
3. Pandey, B.P.1981. Gymnosperms. Chand & Co., New Delhi.
4. Vashista, P.C., Sinha and Anil Kumar. 2008. Text book of Bryophytes. Chand & Co., New Delhi.
5. Shukla and Mishra. 1982. Essentials of Paleobotany. Vikas Publishing House, Pvt Ltd., New Delhi.

REFERENCES

1. Pandey, B.P. 1994. A Text book of Botany – Pteridophyta. Chand & Co. New Delhi.
2. Rashid. 1995. An introduction to Pteridophytes. Vikas Publishing House, Pvt. Ltd., New Delhi.
3. Sporne, K.R. 1980. Morphology of Petridophytes –B.I. Publications, New Delhi
4. Smith, G.M. 1955. Cryptogamic Botany Vol. II. Tata Mc Graw Hill Publications, New Delhi.

UBO-3
SEMESTER II **16UBO2CL**

Total hours: 30 **Credits**: 2

C. Pr.1 - LIST OF PRACTICALS FOR

C.P. 1- BIODIVERSITY - I & II

1. **Bacteria:** Staining – Gram positive and Gram negative
2. **Algae:** Internal and reproductive structures of the following:-
   Nostoc
   Volvox
   Caulerpa
   Diatoms
   Sargassum
   Polysiphonia.
3. **Fungi:** Structure and reproduction of the following:-
   Albugo
   Rhizopus
   Saccharomyces
   Penicillium
   Lycoperdon
4. **Lichen:** Structure and reproduction of the *Usnea*.
5. **Pathology**: Symptoms, causative organisms and control measures of
   TMV disease
   Tikka disease of Groundnut and
   Citrus canker

C.P. 2- PLANT DIVERSITY - II

Structure and reproduction of the following:-

Bryophytes

Marchantia
Anthoceros and
Funaria.

Pteridophytes

Lycopodium
Selaginella
Equisetum
Ophioglossum and
Adiantum.

Gymnosperms

Cycas and *Gnetum.*

Paleobotany

Rhynia
L*epidodendron*
Lepidocarpon and
Williamsonia.

UBO-4

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (PRACTICALS)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Max. Marks: 60 Marks**

BREAK UP OF MARKS

PRACTICAL – I

I. Micro-preparation		**- 24 Marks**
II. Spotters (6 x 3)		**- 18 Marks**
III. Plant systematic position		**- 04 Marks**
IV. Plant pathology		**- 04 Marks**
Submission of record		**- 10 Marks**
	TOTAL	**- 60 Marks**

UBO-5

SEMESTER III **15UBO303**

C.P.3 - ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS

Objectives

- To study the internal structure of various plants.
- To know the reproductive system of flowering plants (Angiosperms).

Total hours: 75 **Credits**: 4

UNIT I **(15 HOURS)**

Apical meristems- Vegetative shoot apex and root apex (Angiosperm) – Theories Structure and functions of simple tissues- Parenchyma, Collenchyma, and Sclerenchyma.

UNIT II **(15 HOURS)**

Structure and functions of complex tissues - Xylem, Phloem and Cambium. Primary structure of monocot and dicot stem. Epidermal tissue system: Stomata and Trichomes.

UNIT III **(15 HOURS)**

Secondary thickening in dicot stem. Periderm: Phellogen, Phellem, Phelloderm and lenticels. Anomalous secondary thickening in *Achyranthes*, *Nyctanthus* and *Dracaena* stem.

UNIT IV **(15 HOURS)**

Structure of microsporangium. Tapetum- structure, types and functions. Structure of female gametophytes - (*Polygonum*). Structure and types of ovule. Double fertilization. Endosperm- types, structure and functions (nuclear, cellular, helobial, ruminate).

UNIT V **(15 HOURS)**

Embryo- Structure and development of dicot embryo (*Capsella* type) and monocot embryo (Najas). Polyembryony- Classification and significance. Parthenocarpy.

TEXTBOOKS

1. Singh, Pandey and Jain, 2007. Anatomy of Seed plants, Rastogi Publications. New Delhi.
2. S. S. Bhojwani, S. P. Bhatnagar, 1985. Embryology of Angiosperms, Vikas Publishing House, Noida.
3. Pandey, B.P.1978. Plant Anatomy. Chand and Co, New Delhi.
4. Maheswari, P. 1950. Introduction to the embryology of Angiosperms. Vikas Publishing House, New Delhi.

REFERENCE

1. De Roberties. 1989. Cell and Molecular Biology. Mc Graw Hill, New Delhi.
2. Annie Regland. 2000. Developmental Botany –Saras Publication, Kanyakumari
3. Fahn, A1985. Plant Anatomy. Pergamon Press, Great Britain.
4. Esau, K. 1991. Plant Anatomy. Wiley Eastern Ltd. New Delhi. 7th Edition

UBO-6

Part IV – III Semester **15UGA3S1**

Skill Based Subject 1 – GENERAL AWARENESS (ONLINE)

Total Credits: 3 **Total Hours : 30**

Objectives

1. To acquire knowledge in relation to various competitive examinations.
2. To create awareness about an online examination which is being followed in competitive examinations.

UNIT I **6 Hrs**

1. Tamil and other Literatures

Tamil, English, Christian and Muslim Literatures – Ancient Literature – Bakthi Literature – Epics – Medieval Literature – Modern Literature (Novel, Dramas, Short Stories, Modern Poetry).

2. Economics and Commerce

Basic Economics – Auditing – Management – Capital Market – Foreign Trade – Companies – Banking.

3. Social studies

Indian History – Inventions – Indian Poetry – Constitution - Judiciary – Languages – Literacy – Indian Geography – Lithosphere – Climate – Soil – Agriculture – Population.

UNIT II **6 Hrs**

4. Numerical Aptitude

Objective Arithmetic : Number systems – probability – **HCF and LCM of numbers*** - decimal fractions – simplification – squareroots and cuberoots – average – percentage – profit and loss – ratio and proportion – time and work – simple interest – area, **volume and surface area*.**

5. Verbal Aptitude

Spot the odd one out – correct form of verb – preposition – find out the rightly spelt word – choose the correct meaning of idioms – synonyms and antonyms.

6. Abstract Reasoning

Logic Reasoning : Logic – statement – arguments – statement assumptions – Statement course of action – theme detection – deriving conclusion from passages.

Non – verbal Reasoning : Series – analogy – classification – analytical reasoning – mirror images – water images – paper folding – paper cutting – rule detection – grouping of identical figures.

UNIT III **6 Hrs**

7. General Science and Technology

SCIENCE - Basic principles and concepts in Physics, Chemistry, Botany and Zoology.

TECHNOLOGY - Metallurgy, instrumentation, discoveries and inventions of techniques.

8. Computer Science

Historical evolution of computers – Computer applications – Data processing concepts – Computer codes and arithmetic – Hardware components – Data Structures.

9. Education

Development process of the learner – Principles of development (physical, social, emotional and intellectual) – Learning process – Teaching and teacher behaviour – Interaction analysis – Microteaching – Teacher as a leader – Motivation – Personality dimension – concept of mental health – Counselling.

UNIT IV **6 Hrs**

10. Library and Information Science

Library and Information Science – Basics, Computer, Library Network and others like Research, Reprography etc.

11. Sports and Games

Athletics – Track Events – Field Events – Games – Indoor Games – Outdoor Games – General knowledge – Sport and Olympics – First Aid.

12. Current Affairs

State, Central and International affairs: Budgets – Politics – Sports – Education – Commerce and Industry – Inventions – Science and Technology – Currency – Agriculture – Movies – Guinness records – Awards – IT Industry – Space Research – Defence etc.

UNIT V **6 Hrs**

13. National Cadet Corps (NCC)

Introduction to the Armed Forces (Army, Navy, Air Force) – Dril – Weapon Training – Map Reading – Civil Defence.

14. National Service Scheme (NSS)

History of NSS – History of Motto, Symbol, Badge – Aims and Objectives – Duties and Total Hours – Organisational and Administrational setup – History of voluntary organization – Regular activities – Special camp activities – Special programmes – awards – Important days.

15. Youth Red Cross (YRC)

History of International Red Cross – History of Indian Red Cross – History of Youth Red Cross – Main objectives of YRC – Emblem – Fundamental principles of Red Cross – Organizational Setup – Activities of Youth Red Cross – Role of different functionaries – Training programmes for YRC Program Officers – Training programme for YRC

Volunteers – YRC Song – Working Hours – General orientation – Special orientation – Program skill learning.

*** Self Study (Questions may be asked from these topics also)**

Text Book

1. VBC 1 – General Awareness, Question Bank, Kongunadu Arts and Science College, Coimbatore – 29, 2006.

Question Paper Pattern

Max. Marks 100

End of Semester Examination (ESE)- On-Line Examination **75 Marks**

1. 150 questions are to be given. Each question carries ½ mark.
2. In each unit, 30 questions are to be given, covering all the 5 units.

Continuous Internal Assessment (CIA) (through On-Line) **25 Marks**

a) Two Exams.	15 Marks
b) Assignment**	5 Marks
c) Attendance	5 Marks

** Each student has to submit an assignment in the topic Current Affairs area.

UBO-7

SEMESTER IV **15UBO404**

C.P.4 - BIOSTATISTICS AND BIOPHYSICS

Objectives

- To understand the interaction of plants with light.
- To find solutions by solving the biological problems.

Total hours: 75 **Credits:** 4

UNIT I **(15 HOURS)**

Biostatistics: – Definition, Four steps in statistics, Data collection methods - Sampling – census and sampling method, law of statistical regularities, law of inertia of large numbers, essential of sampling, methods of sampling – probability of sampling – simple, random sampling, stratified random sampling, cluster sampling, non-probability sampling – judgment sampling, quota sampling and convenient sampling (theory only).Primary data and secondary data.

UNIT II **(15 HOURS)**

Classification of data and Frequency distribution. Tabulation, graphic and diagrammatic representation of data.

UNIT III **(15 HOURS)**

Measures of central tendency – Mean [Arithmetic only] median and mode. Rounding off figures. Precision, accuracy and error. Dispersion or deviation- range, average deviation, variance, standard deviation and standard error. Test of significance- chi-square test and T- test.

UNIT IV **(15 HOURS)**

Biophysics: - Electromagnetic radiation - nature, absorption, interaction with matter, role of electrons in absorption of light, electron multiplicity. Excitation, de-excitation & path of de-excited electrons.

UNIT V **(15 HOURS)**

Study of radioactivity – alpha, beta and gamma radiations. Radioactive isotopes and half-life period. Ionization and detection – autoradiography, Geiger- Muller counter and Scintillation counter.

TEXTBOOKS

1. Palanichamy, S. 1986. Principle of biophysics. Paramount Publication, Palani.
2. Palanichamy, S & M. Manoharan. 1994. Statistical methods for biologists. Paramount Publication, Palani.
3. Arumugam, N. 2003. Basic concepts of Biostatistics. Saras Publications, Nagarcoil.
4. S.P. Gupta, S.P. 2001. Statistical methods. Sultan Chand & Sons, Educational Publishers, New Delhi.

REFERENCES

1. Salil Bose. 1981. Elementary biophysics – Part 1. Vija Printers, Madurai.
2. Khan, I.D. and A. Khanum. 1994. Fundamentals of Biostatistics. Mc Graw Hill, New Delhi.
3. Vasantha Pattabhi & N. Gautham. 2004. Bistatistics. Narosa Publishing House, Chennai.

UBO-8

SEMESTER IV **15UBO4CM**

C.Pr. 2 – LIST OF PRACTICALS FOR

C.P.3 - ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS

Total hours: 60 **Credits**: 2

1. Primary structure of Stem, Root and Leaf.
2. Secondary structure of Stem, Root and Leaf.
3. Secondary thickening of Stem and Root.
4. Anomalous secondary thickening-*Boerhaavia*, *Nyctanthus, Dracaena* and *Achyranthes*.
6. T.S of anther - various stages.
7. Types of Endosperm.
8. Embryo mounting: *Tridax*

C. P.4 - BIOSTATISTICS AND BIOPHYSICS

Biostatistics: Simple problems in biostatistics.

a) Mean
b) Median
c) Mode
d) Standard Deviation
e) Standard Error
f) Chi-Square Test.
g) T – test

Biophysics

1. Demonstration of Nature of EMR and Spectrum.
2. Diagrams of fluorescence, phosphorescence, delayed light emission, autoradiography, Geiger-Muller counter and Scintillation counter.

UBO-9

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (PRACTICALS)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Max. Marks: 60 Marks**

BREAK UP OF MARKS

PRACTICAL – II

I. Anatomy section	**- 24 Marks**
II. Biostatistics	**- 10 Marks**
III. Embryo dissection	**- 06 Marks**
IV. Spotters (5 × 2)	**- 10 Marks**
Submission of record	**- 10 Marks**
TOTAL	**- 60 Marks**

UBO-10

SEMESTER IV **15UBO4S2**

Skill Based Subject - II– PLANT TISSUE CULTURE – CONCEPTS AND APPLICATIONS

Objectives:

- To reproduce the rare endemic & endangered plants from tissue culture techniques.
- To gain the theoretical knowledge on gene manipulation for the manufacturing of biogoods.

Total hours: 30 **Credits**: 3

UNIT I **(6 HOURS)**

Plant tissue culture - Historical events, organization of tissue culture laboratoty, basic requirements of tissue culture laboratory. Concepts and applications of tissue culture.

UNIT II **(6 HOURS)**

Totipotency of cells, Nutrient media – preparation of MS Media, B5 medium and Nitch medium. Collection of explants, Surface Sterilization, Inoculation, Incubation, Callus production and Sub culture.

UNIT III **(6 HOURS)**

Micropropagation, Regeneration method – Organogenesis and Embryogenesis. Plant tissue culture type s and their uses - Meristum culture, Anther culture, pollen culture and Suspension culture.

UNIT IV **(6 HOURS)**

Somaclonal variation and variants. Somatic embryogenesis, Protoplast isolation and fusion, somatic hybridization- hybrids and artificial seeds.

UNIT V **(6 HOURS)**

Transgenic plants – Biotic Resistance – Herbicide resistance, Insect resistance,Virus resistance, Fungai and Bacteria resistance. Abiotic resistance – Stress tolerance. Transgenci plants improved storage protein and carbohydrate.

TEXTBOOKS

1. Gupta, P.K. 1996. Elements of Biotechnology. Rastogi Publications, Meerat.
2. Kumaresan, V.K. Biotechnology. 2003. Saras Publications, Kanyakumari.
3. Razdon, M.K. 2003. Plant Tissue Culture. Oxford and IBH Publishing Co. Private Ltd., New Delhi.

REFERENCES

1. Chawla, H.S. 1998. Biotechnology in crop improvement by International Book Distributors, Dehra Dun.
2. H.K. Choudhri, H.K. 2005. Elementary principles of Plant Breeding. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Chawla, H.S. 2002.Introduction to Plant Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.

UBO-11

SEMESTER V **16UBO505**

C.P. 5 – FUNDAMENTALS OF COMPUTER AND BIOINFORMATICS

Objectives

- To understand how biological informations get manipulated in systems.
- To know the creation of biological databases, availability of biological informations and handling tools.

Total hours: 60 **Credits**: 4

UNIT I **(12 HOURS)**

Introduction to computer – applications, types, generations, capabilities - components of computer – Hardware – CPU, Input and output devices, memory units, auxiliary storage devices.

UNIT II **(12 HOURS)**

Computer architecture, number system, Software – classification of software. Language – machine language – high level language - compilers, translators. Operating systems / DOS / windows. Internet – www, E-mail, Browser and search engines.

UNIT III **(12 HOURS)**

Windows- 2007 an overview – MS-Word - creation of documents and tables, MS-Excel- preparation of workbook and charts, MS-PowerPoint – features and slide presentation. MS-ACCESS- Creating and Querying a Database. Database languages, database independence and database administrator. Data warehousing and data mining.

UNIT IV **(12 HOURS)**

Introduction to Bioinformatics. Regulation of gene expression in Prokaryotes and Eukaryotes. Protein Structure – Primary, secondary, tertiary and quaternary (Outline only). Biological databases, importance and classification (Outline only). Gene finding methods.

UNIT V **(12 HOURS)**

Sequence alignment, evolutionary basis of sequence alignment, global Vs local alignment, searching for similarities using scoring matrices and gap penalty. Biomolecular visualization, phylogenetic analysis and computer aided drug designing.

TEXTBOOKS

1. Mani, K and N. Vijayaraj. 2002. Bioinformatics for beginners. Kalaikathir Achakam, Coimbatore.
2. David W. Mount. 2001. Bioinformatics -Sequence and Genome analysis. Cold Spring Harbor Laboratory Press.
3. Rajaraman, V. 2004. Fundamentals of computer. Prentice Hall of India Pvt Ltd.

REFERENCES

1. A.D. Baxevanis and B.J.Francis (Eds.). 1998. Bio-informatics – A practical guide to the analyzing of gene protein. John Wiley and sons.
2. Stuart M. Brown. 2000. Bioinformatics- A biologists guide to bio computing and the internet. Eaton Publishing Co.
3. Arthor M. Lesk. 2002. Introduction to Bioinformatics. Oxford University Press, UK. T.K. Attwood and Parry-Smith 2007. Introduction to bioinformatics. Samiron Phukan Dorling Kinders India, Pvt., Ltd.

UBO-12

SEMESTER V **15UBO506**

C.P.6. - TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY

Objectives

- To analyze the classification and description of flowering plants.
- To study about the cultivation and economic uses of Paddy, Cotton and Sugarcane.

Total hours: 75 **Credits**: 5

UNIT I **(15 HOURS)**

Aims and objectives of taxonomy. Systems of classification – Natural (Bentham and Hooker), Phylogenetic (Engler & Prantl) and Modern (Takhtajan). Merits and Demerits –Guidelines to the identification of plant specimen.

UNIT II **(15 HOURS)**

Herbarium techniques and uses, National herbarium- CNH - Regional herbarium – MH. Botanical Survey of India. Nomenclature - Binomial, ICBN- principles. Typication, Author citation, Effective and valid publication. Rejection of names.

UNIT III **(15 HOURS)**

Detailed study of the following families with reference to the Morphology, Taxonomy and their economic importance. Annonaceae, Sterculiaceae, Rutaceae, Anacardiaceae, Caesalpiniaceae, Mimosaceae, Myrtaceae, Curcurbitaceae, Apiaceae, Rubiaceae, Asteraceae, Sapotaceae and Apocynaceae.

UNIT IV **(15 HOURS)**

Asclepiadaceae, Solanaceae, Acanthaceae, Verbenaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae, Orchidaceae, Zingiberaceae, Liliaceae, Arecaceae and Poaceae.

UNIT V **(15 HOURS)**

Economic Botany- study of botany, cultivation and utilization of the following with reference to Tamil Nadu. Fiber yielding plant (cotton), sugar yielding plant (sugarcane) and food crops – (Cereals - Paddy and Pulses - Soyabean). Spices and condiments (chillies and turmeric).

TEXTBOOKS

1. Sharma, O.P. 1986. Modern taxonomy. Rastogi Publications, New Delhi.
2. Subramanyam, N.S. 1987. Modern Plant Taxonomy, Vikas Publishing House, New Delhi.
3. Sambamoorthy A.V and N.S. Subramanyam. 1989. A text book of Economic Botany. Wilay Easters, New Delhi.
4. Verma, V. 2006. A textbook of Economic Botany. Emky Publication, New Delhi.

REFERENCES

1. Singh, V. and D.K. Jain. 1997. Taxonomy of Angiosperms. Rastogi Publications, New Delhi.
2. Pandey, B.P.1997. Taxonomy of Angiosperms. Chand & Co., New Delhi.
3. Jain, S.K. and R.R. Rao. 1977. A. Handbook of Field and Herbarium methods. Today and Tomorrow Publishers, New Delhi.
4. Henry, A.N. and Chandrabose. 1982. An aid to the international code of botanical nomenclature. BSI Calcutta.

UBO-13

SEMESTER V **15UBO507**

C.P.7. CYTOLOGY, GENETICS & PLANT BREEDING

Objectives

- To study the cell structure and cell organelles.
- To know about the genes and gene interaction.
- To know the methods of plant breeding and crop improvement.

Total hours: 60 **Credits**: 5

UNIT I **(12 HOURS)**

Structure and function of cell wall, Plasma membrane (Fluid Mosaic Model only) Mitochondria, Chloroplast, Nucleus, Mitosis & Meiosis. Ultra structure of chromosome. Concept and components of a Gene.

UNIT II **(12 HOURS)**

Mendel's laws of inheritance – Mendel's experiments – monohybrid cross, dihybrid cross. Interaction of genes – incomplete dominance, lethal genes, complementary genes, epitasis and duplicate genes.

UNIT III **(12 HOURS)**

Multiple alleles - Blood groups in man. Linkages and crossing over, Cytoplasmic inheritance in plants – male sterility in Maize

UNIT IV **(12 HOURS)**

DNA as a genetic material. DNA Structure, function, replication, genetic code. Mutation - Types of mutation & mutagens.

UNIT V **(12 HOURS)**

Objectives of Plant breeding, Breeding methods – pureline selection, mass selection and clonal selection. Hybridization. Mutation breeding. Heterosis. Achievements in crop improvement -Sugarcane and Cotton.

TEXTBOOKS

1. Veerbala Rastogi. 1994. Text book of Genetics. National Press, Meerut.
2. Verma, P.S. & Agarwal V.K. 1983. Cytology. Chand & Co. New Delhi.
3. Gupta, P.K. & M.S. Swaminathan. 2000. Cytology, genetics and Evolution. Rastogi Publication, Meerut.
4. Arumugam, D.N.1999. Cell Biology. Saras Publication, Nagarcoil.
5. Singh, B.D. 2000. Plant Breeding-Principles and Methods. Kalyani Publishers, New Delhi.

REFERENCES

1. De Roberties. 1989. Cell Biology. McGraw Hill Publication, New Delhi.
2. Chaudhari, H.K. 2005. Elementary principles of plant breeding (25th Ed.). Oxford & IBH Publishing Co. (P) Ltd., New Delhi.
3. Allard. 1960. Principles of plant breeding. John Wiley & Sons, New York.
4. Gardner, E.J., P. Snustad & D. Dobzzonsky, 1995. Principles of Genetics.TATA Mc Graw Hill Company Ltd. New Delhi.
5. Gupta, P.K. 2004. Elements of genetics. FNA 2nd Edition.

UBO-14

SEMESTER V **16UBO508**

C.P.8. – PLANT ECOLOGY, PHYTOGEOGRAPHY AND RESOURCE CONSERVATION

Objectives

- To understand the ecosystem organization.
- To have the knowledge on resources available for the benefit of mankind.

Total hours: 60 **Credits**: 5

UNIT I **(12 HOURS)**

Principles of Ecology. Climatic factors- role and importance of light, temperature, wind and rainfall on the growth of plants. Edaphic factors, Biotic factors – Communities -Characters and methods of studying plant communities.

UNIT II **(12 HOURS)**

Community succession - Kinds and causes. Structural and functional changes in communities. Climax concept. Morphological and anatomical adaptations of Hydrophytes, Xerophytes and Halophytes –

UNIT III **(12 HOURS)**

Ecosystem – Basic structure and functions: Pollution – causes and possible control measures of air, water, soil and noise pollutions and biological waste management. Plants - indicator of pollution.

UNIT IV **(12 HOURS)**

Phytogeographical belts of world. Origin of cultivated plants. Botanical regions of India. Continental drift. Age and area hypothesis, endemism, plant migration and barriers.

UNIT V **(12 HOURS)**

Resource conservation – types of resources, conservation of soil, water, agriculture resources, range, forest and freshwater bodies.

TEXT BOOKS

1. Sharma, P.D. 2000. Ecology and Environment. Rastogi Publications, New Delhi
2. Shukla. R.S. and P. S. Chandal. 2000. Plant Ecology and soil science. Chand & Co. Ltd., New Delhi.
3. Vasishta, P.C. 1993. Plant Ecology. II Edition. Vishal Publications.
4. Verma and Agarwal. 1998. Principles of Ecology, Chand & Co. Ltd., New Delhi.

REFERENCES

1. Ambasht R.S. 1992. Text book of Plant Ecology, Students and Friends & Co. Varanashi.
2. Schimper, A.F. 1960. Plant geography. Lubrecht & Cramer Ltd., New York.
3. Richard, S. Ostfeld and William H. Schlesinger. The year in Ecology and conservation Biology, 2011. Willey – Blackwell Publications.

UBO-15

SEMESTER V **15UBO5CN**

C.Pr. 3- FUNDAMENTALS OF COMPUTER AND BIOINFORMATICS

LIST OF PRACTICALS

Total hours: 60 **Credits**: 2

1. Creating, editing and printing a document in Ms-Word.
2. Creating, editing and printing a table in MS-word.
3. Data entry and chart preparation using Ms-Excel.
4. Creating a presentation in Ms-PowerPoint.
5. Creating and querying the database using MS-ACCESS.
6. Gene prediction using GenMark (HMM).
7. Similarity search using BLASTs.
8. Protein structure prediction using GOR-IV.
9. Phylogenetic analysis using Clustal-X.
10. Bio-Molecular Visualization using RASMOL.

UBO-16

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (PRACTICALS)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Max. Marks: 60 Marks**

BREAK UP OF MARKS

PRACTICAL – III

I. Writting Algorithms for A & B (15 + 15)	**- 30 Marks**
II. Results for A & B (08 + 08)	**- 16 Marks**
III. Viva-voce for A & B (02 + 02)	**- 04 Marks**
Submission of record	**- 10 Marks**
TOTAL	**- 60 Marks**

UBO-17

SEMESTER VI **15UBO609**

C.P.9- HORTICULTURE

Objectives

- To learn about the propagation methods of horticulture plants.
- To study about the gardening and its maintenance.
- To know about commercial floriculture and flower arrangement.

Total hours: 60 **Credits**: 5

UNIT I **(12 HOURS)**

History**, s**cope and divisions of Horticulture - Methods of vegetative propagation - cutting, layering, grafting and budding. Manures: organic- Pancha kavya, and inorganic. Irrigation.

UNIT II **(12 HOURS)**

Gardening – Types of gardens – Formal, Informal and kitchen garden. Garden components - lawn making, glass house, rockery, water garden, topiary and Terrarium culture.

UNIT III **(12 HOURS)**

Production technology - Cultivation of vegetables – Bhendi and Tomato. Cultivation of fruits - Banana and Grapes. Growth regulators in horticulture. Plant protection measures for horticultural crops.

UNIT IV **(12 HOURS)**

Cultivation of flowers – Jasmine and Rose, Cut flowers - Flower arrangement and Bonsai. Cultivation of plantation crops – Tea and Cardamom.

UNIT V **(12 HOURS)**

Extraction of Jasmine concrete and papain. Post harvest handling of fruits and vegetables. Preservation of fruits and vegetables, Cultivation of medicinal plants – *Gloriosa superba* and *Aloe vera*.

TEXTBOOKS

1. Horticulture – Principles and Practices. George Aquach-2002. Parson Education Ltd. Delhi
2. Kumar, N. 1999. An introduction to horticulture. Rajalakshmi Publication, Nagarcoil.
3. Bhattacharjee, S.K. 2006. Advances in Ornamental Horticulture. Pointer Publications, Jaipur.
4. Kumar N. 2006. Horticulture: Principles and practices. New India Publishing agency, New Delhi 88.

REFERENCES

1. Chaha, K.L. 2001. Handbook of horticulture. ICAR, New Delhi.
2. Edwin Biles. 2003. The complete book of gardening. Biotech book, New Delhi.
3. Singh, S.P. 1999. Advances in Horticulture and Forestry. Scientific Publishers, Jodhpur.
4. Sharma, V.K. 2004. Advances in Horticulture: Strategies, Production, Plant Protection and Value Addition - Deep and Deep Publications, New Delhi.
5. Desh Beer Singh and Poonam Wazir. 2002. Bonsai-An Art. Scientific Publishers, Jodhpur.
6. George Acquaah, 2002. Horticulture- principles and practices, Person Education Ltd., Delhi.
7. Bonsai – an art.

UBO-18

SEMESTER – VI **16UBO610**

C.P.10 - BIOCHEMISTRY

Objectives

- To study the structure of atom and chemical bonds.
- Metabolism of chemical reactions in cell
- To understand the biochemical techniques.

Total hours: 75 **Credits**: 5

UNIT I **(15 HOURS)**

Basic concept of Atoms and molecules; types of bonding; primary chemical bonds – covalent, hydrogen bonds, isotopes and isomerism. Acids, base, solutions, colloids, pH and buffer systems.

UNIT II **(15 HOURS)**

Structure and classification of carbohydrates: (Monosaccharides, Oligosaccharides, Polysaccharides), Biological functions of carbohydrates. **Lipids:** simple & compound lipids, sterols and Fatty acids.

UNIT – III **(15 HOURS)**

Proteins: Classification, properties and synthesis of proteins. Amino acids: Structure, Classification, properties, isoelectrical point and Zwitter ions – isomerism.

UNIT – IV **(15 HOURS)**

Enzymes: Definition, Structure, properties, mode of action and factors affecting enzyme activity. **Nucleic acids:** DNA – Structure, types, Replication of DNA (Conservative, Semi-conservative method); RNA – Structure, types and its functions.

UNIT – V **(15 HOURS)**

Biochemical techniques: Chromatography - Paper and Thin layer, Colorimetry and Spectrophotometry- UV – VIS, Infrared – Single beam and Double beam Electrophoresis – AGE and PAGE and Polarimetry.

TEXT BOOKS

1. H. S. Srivastava, 1993. Elements of Biochemistry. Rastogi Publications, Meerut.
2. Jain, J.L. 2002. Fundamentals of Biochemistry. S. Chand & Co. New Delhi
3. Veerakumari, L. 2009. Bioinstumentation. MJP Publishers
4. L.M. Narayanan, Dulsy Fathima, K.Nallasingam, R.P. Meyyan Pillai, N.Arumugam, S.Prasanna Kumar.2010. Biochemistry. Saras Publication

REFERENCES

1. Weel, J.H. 1990. General Biochemistry. Wiley Eastern Ltd.
2. Albert L. Lehninger. Principles of Biochemistry. ICAR, Delhi.
3. L. Stryer, 2002, Biochemistry,W.H. Freeman.
4. Satyanarayana, V. 2005. Essentials of Biochemistry. Arunabha Sen & Allied Pvt., Ltd

UBO-19

SEMESTER VI **15UBO611**

C.P.11- PLANT PHYSIOLOGY

Objectives

- To study the structure of atom and chemical bonds.
- To know the secondary metabolites in plants.
- To study about water potential and its components.

Total hours: 75 **Credits**: 5

UNIT I **(15 HOURS)**

Water, its biological significance, water relationships, osmosis, permeability, diffusion, chemical potential. Water potential, matric potential, pressure potential. Absorption of water and minerals.

UNIT II **(15 HOURS)**

Ascent of sap – path & mechanism of cohitive theory, Translocation of solutes. Transpiration – its kinds and significance and factors. Physiology of stomatal movement.

UNIT III **(15 HOURS)**

Photosynthesis – pigment system Light and Dark reaction, C_3 and C_4 pathway. Respiration - Aerobic & Anaerobic, Glycolysis and Krebs cycle.

UNIT IV **(15 HOURS)**

Nitrogen metabolism, Nitrogen cycle and Biological Nitrogen Fixation – Symbiotic and Non- Symbiotic. Synthesis of amino acids.

UNIT V **(15 HOURS)**

Plant growth and development, Growth regulators- auxins, gibberellins, Kinetins, ethylene and ABA. Physiology of flowering – Photoperiodism, Vernalization.

TEXTBOOKS

1. Jain, V.K. 1993. Fundamentals of plant physiology. S. Chand & Co. New Delhi
2. Verma, S.K. 1999. A textbook of Plant physiology. S. Chand & Co. New Delhi
3. Annie Ragland, Rajkumar, Rajaatnam and Jayakumar. 2007. Plant Physiology. Saras Publications, Nagarcoil.
4. Chopra. 1995. A text book of Plant Physiology. EMKAY Publications, New Delhi.

REFERENCES

1. Noggle and Fritz. 1992. Introductory plant physiology. Prentice Hall of India. Pvt. Ltd. New Delhi.
2. Malik. 2002. Plant physiology. Kalyani Publishers, New Delhi.
3. Satyanarayana, V. 2005. Essentials of Biochemistry. Arunabha Sen & Allied Pvt., Ltd.
4. Devilin, 1986. Plant physiology. CBS Publishers and distributors, New Delhi.

UBO-20

SEMESTER VI **15UBO6CO**

C.Pr. 4 - LIST OF PRACTICALS FOR

C.P. 6 - TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY

Total hours: 90 **Credits**: 2

1. Identification of plant specimens with reference to their families prescribed in the syllabus following Bentham & Hookers system of classification.
2. Identification of economically important products with reference to their plant name and family.
3. Technical description of plant parts, including floral parts LS of flower, floral diagram and floral formula with reference to the families mentioned in the theory.
4. Field visit to nearby floristic regions to study of the flora.
5. Submission of 25 herbarium sheets (local plants) with field notes for internal and external valuation

C.P. 7- CYTOLOGY, GENETICS & PLANT BREEDING

1. Study of cell organelles through slides and photographs.
   Structure of cell wall, Plasma membrane, Mitochondria, chloroplast, Nucleus.
2. Study of mitosis using onion roots.
3. Study of meiosis using *Rheo* flower buds.
4. Simple problems in genetics.

C.P. 8- PLANT ECOLOGY, PHYTOGEOGRAPHY AND RESOURCE CONSERVATION

1. Line transects – frequency determination in the vegetation of college campus.
2. Belt transect – frequency determination in the vegetation of college campus
3. Quadrat – determination of frequency and density in the vegetation of college campus
   Observation of adaptation features morphological and anatomical in xerophytes hydrophytes, halophytes and epiphytes
5. Charts – Ecosystem – Pond, forest, grasslands, hydrosere and lithosere.
6. Phytogeographical regions of India.

UBO-21

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (PRACTICALS)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Max. Marks: 60 Marks**

BREAK UP OF MARKS

PRACTICAL – IV

I. Family description	**- 05 Marks**
II. Phytogeography	**- 05 Marks**
III. Meiosis/Mitosis	**- 05 Marks**
IV. Plant ecology	**- 05 Marks**
V. Ecology experiment	**- 07 Marks**
IV. Genetics problem	**- 04 Marks**
IV. Spotters (7 × 2)	**- 14 Marks**
VII. Herbarium	**- 05 Marks**
Submission of record	**- 10 Marks**
TOTAL	**- 60 Marks**

UBO-22

SEMESTER VI **16UBO6CP**

C.Pr. 5- LIST OF PRACTICALS FOR

Total hours: 60 **Credits**: 2

C.P. 9 – HORTICULTURE

1. Demonstrations of vegetative methods of propagation
2. Flower arrangement with cut flowers.

C.P. 10 – BIOCHEMISTRY

1. Demonstrations of pH meter, spectrophotometer and centrifuge.
2. Estimations of lipids, aminoacids and protein.
3. Separation of secondary metabolites through Coloum chromatography.
4. DNA estimation using Biophotometer.

C.P.11 – PLANT PHYSIOLOGY

1. Determination of osmotic pressure of cell sap of the given specimen – *Rheo* leaf.
2. Rate of respiration in flower buds/ germinated seeds using simple respiroscope.
3. Separation of leaf pigments by paper chromatography.
4. Measure the rate of photosynthesis under varying condition of CO_2 concentration.
5. Effect of light intensity on O_2 evolution during photosynthesis.
6. Determining the rate of transpiration using Ganong's photometer (Demonstration only).
7. Determination of water absorption and transpiration ratio (Demonstration only).
8. Nitrification in soil (Demonstration only).
9. Solution culture (Demonstration only).

UBO-23

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (PRACTICALS)

End Semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Max. Marks: 60 Marks**

BREAK UP OF MARKS

PRACTICAL – V

I. Physiology major experiment		**- 15 Marks**
II. Physiology setup		**- 05 Marks**
III. Horticulture		**- 10 Marks**
IV. Biochemistry		**- 10 Marks**
IV. Spotters (5 × 2)		**- 10 Marks**
Submission of record		**- 10 Marks**
	TOTAL	**- 60 Marks**

UBO-24

SEMESTER- VI **15UBO6S4**

Skill Based Subject – IV - CULTIVATION AND MARKETING OF MEDICINAL PLANTS

Objectives

- To promote and undertake research, development and extension services in the field of medicinal crop plants.
- To understand the medicinal values marketing and their importance in Pharmaceutical industries.

Total hours: 30 **Credits**: 3

UNIT I **(6 HOURS)**

Scope and importance of medicinal plants. *In situ* and *ex situ*, Conservation of medicinal plants. Medicinal Plants- Present and future status.

UNIT II **(6 HOURS)**

Role of Conservation of medicinal plants by Indian Council of Agriculture Research, and National Medicinal Plants Board. Intellectual Property Rights (IPR) and their applications.

UNIT III **(6 HOURS)**

A general account on the methodology of cultivation, therapeutic uses of plants. Rhizome – curcuma, Root- *Asparagus racemosus* Twigs- *Adathoda vasica*,

UNIT IV **(6 HOURS)**

Cultivation of Medicinal Plants: Leaves- *Gymnema sylvestris* . Bark - *Cinchona*, Flower bud- *Syzygium*. Fruits- *Phyllanthus emblica*.

UNIT V **(6 HOURS)**

Marketing Scenario of Medicinal Plants – Domestic Market, Global Market, Export: Standard and Quality control (Constraints). Future strategy for Medicinal plants.

TEXT BOOKS

1. Purohit, S.S and S.P. Vyas 2005. Medicinal Plant Cultivation. A Scientific Approach. Agrobios Publishers, Jodhpur, India.
2. G. E. Treases and W. G. Evans. Pharmocognosy Bailliare, Tindall Esaibolarna. 1983.

REFERENCES

1. D.N. Guha Bakshi, P. Sensarma, DC pal – A lexicon of medicinal plants in India. Vol. II. 2001, Naya Prakash, Calcutta.
2. S. Thirugnanam – Mooligai maruthuvam, Selvi Pathipagam, Trichy- 2003.
3. R.S. Satoskar, S.D. Bhanalarkar, S.S. Ainapure. Pharmacology, Pharmaco Therapeutics - popular Prakasam, Mumbai- 2002.
4. Anil K. Dhiman, Sacred plants and their medicinal uses – Daya Publishing House, New Delhi – 2003.
5. H. Panda, Essential oils- hand book, national Institute of Industrial Research, New Delhi- 2001.
6. H. Panda, Hand book of herbal medicines. Asia Pacific Business Press, New Delhi- 2001.

ALLIED PAPER

UBO-25

SEMESTER - I **15UBO1A1**

Allied-1 Botany- 1

(Phycology, Mycology, Plant Pathology, Bryophytes, Pteriodophytes & Gymnosperms)
(For Zoology students)

Objectives

- To know the classification of Cryptogams & Phanerogams.
- To study the structure and life cycle patterns of primitive to advanced organisms.
- To know the Economic important values of Algae and Fungi.

Total hours: 105 **Credits**: 4

UNIT I **(21 HOURS)**

Phycology: Classification by Fritsch (1945) (outline only), Structure, Reproduction and life cycle of the following Genus: *Oscillatoria*, *Caulerpa*, and *Chara*. Economic importance of algae (briefly).

UNIT II **(21 HOURS)**

Mycology and Plant Pathology: Classification by Alexopoulos and Mims (1979) (outline only), Structure, Reproduction and Life cycle of the following Genus: *Albugo* and *Agaricus*. Tikka disease of ground nut and Citrus canker. Economic importance of Fungi.

UNIT III **(21 HOURS)**

Bryophytes: Classification by K.R.Sporne (outline only), Structure, Reproduction and Life cycle of the following Genus: *Marchantia* and *Funaria***.**

UNIT IV **(21 HOURS)**

Pteriodophytes: Classification by Riemer (outline only), Structure, Reproduction and Life cycle of the following Genus: *Lycopodium* and *Adiantum*.

UNIT V **(21 HOURS)**

Gymnosperms: Classification by K.R.Sporne (outline only), Structure, Reproduction and Life cycle of the following Genus: *Cycas* and *Gnetum*.

TEXTBOOKS

1. Gangulee, Das & Kar. 2001. College Botany Vol II. New central Book agency Pvt. Ltd. Calcutta.
2. Pandey, B.P. 1994. A Text book of Botany – Pteridophyta. Chand & Co. New Delhi.

REFERENCES

1. Vashishta, B.R. 1998. The Algae.S. Chand & Co., New Delhi.
2. Vashishta, B.R. 1998. Fungi. S. Chand & Co., New Delhi.
3. Vashista, P.C., Sinha and Anil Kumar. 2008. Text book of Bryophytes. Chand & Co., New Delhi.
4. Vashista, P.C. 1992. Pteriodophyta. Chand & Co., New Delhi.
5. Pandey, B.P.1981. Gymnosperms. Chand & Co., New Delhi.

UBO-26

SEMESTER II **15UBO2A2**

Allied-2 Botany- 2

(Anatomy, Embryology, Taxonomy of Angiosperms, Physiology and Environmental Botany)

(For Zoology students)

Objectives

- To know the internal structures and reproductive systems of various plant.
- To study about the classification and nomenclature of Angiosperms.
- To understand the interaction of plants with water and Photosynthesis process.
- To know the value of ecosystem and soil conservation.

Total hours: 105 **Credits**: 4

UNIT I **(21 HOURS)**

Anatomy: A brief account of Meristems and Tissues (Simple and complex tissue). Primary structure of dicot and monocot stem and root.

UNIT II **(21 HOURS)**

Embryology: Microsporogenesis. Development of Male gametophyte, Megasporogenesis, Development of female gametophyte (Polygonum type). Structure of mature embryo sac. A brief account of types of Endosperms. Development of Dicot embryo (Capsella type).

UNIT III **(21 HOURS)**

Taxonomy of angiosperms: Bentham and Hooker's classification. Study of the following families with their economic importance. Annonaceae, Cucurbitaceae, Asclepiadaceae, Amarantaceae, Liliaceae and Poaceae.

UNIT IV **(21 HOURS)**

Physiology: Water relationships of plants. Osmosis, absorption of water, absorption of ions. Photosynthesis: Photosynthetic apparatus, primary photochemical reaction, path of carbon. (Calvin cycle). Respiratory: substrates, Glycolysis, Krebs's cycle, Phytohormones- auxins and Cytokinins.

UNIT V **(21 HOURS)**

Environmental Botany: Structure and functions of ecosystems. Vegetation types of Southern India. Pollution – Air and Water. Soil conservation.

TEXTBOOKS

1. Gangulee H C Das, K S Dutta CT 1986. College Botany Vol. - I.AIU publications. New Delhi
2. Gangulee and Kar, A K. 1986. College Botany Vol. - II. AIU Publications. New Delhi

REFERENCE BOOKS

1. Pandey, B.P.1997. Taxonomy of Angiosperms. Chand & Co., New Delhi.
2. Jain, V.K. 1993. Fundamentals of plant physiology. S. Chand & Co. New Delhi
3. Shukla. R.S. and P. S. Chandal. 2000. Plant Ecology and soil science. Chand & Co. Ltd., New Delhi.
4. Bhojwani & Bhatnager. 1977. The embryology of angiosperms. Vikas Publishing House, New Delhi
5. Pandey, B.P.1978. Plant Anatomy. Chand and Co, New Delhi.

UBO-27

SEMESTER II **15UBO2AL**

Allied Pr. Botany 1 & 2

(For Zoology Students)

Total hours: 60 **Credits**: 2

LIST OF PRACTICALS

Allied Pr. Botany - 1

1. **Phycology**: Structure and the reproduction of the following:
   Oscillatoria
   Caulerpa
   Chara.
2. **A. Mycology**
   Albugo
   Agaricus.
   B. Plant pathology: Symptoms, causative organisms and control measures of
   Tikka disease of Groundnut
   Citrus canker.
3. **Bryophytes**
   Marchantia
   Funaria.
4. **Pteridophytes**
   Lycopodium
   Adiantum .
5. **Gymnosperms**
   Cycas

Allied Pr. Botany - 2

1. **Anatomy**
   1. Primary and secondary structure of Dicot stems and roots.
   2. Primary structure of monocot stem and root.
2. **Embryology**
   1. Microsporogenesis
   2. Types of the endosperm.
3. **Taxonomy of Angiosperms:** Study of the Morphology and Taxonomy of mentioned in the theory.
4. **Physiology**
   Osmosis, O2 evolution during photosynthesis- demonstration only
5. **Environmental Botany**
   1) Aquatic and terrestrial ecosystem.

UBO-28

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (PRACTICALS)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Max. Marks: 30 Marks**

BREAK UP OF MARKS

ALLIED PRACTICAL

I. Algae and Bryophytes		**- 04 Marks**
II. Pteridophytes/Gymnosperm		**- 06 Marks**
III. Anatomy section		**- 04 Marks**
IV. Taxonomy		**- 04 Marks**
IV. Spotters (2 × 2)		**- 04 Marks**
V. Physiology setup		**- 03 Marks**
Submission of record		**- 05 Marks**
	TOTAL	**- 30 Marks**

ELECTIVE PAPERS

UBO-29 **16UBO5E1**

SEMESTER V

Elective - FORESTRY

Objectives

- To understand the importance and value of trees in urban and community settings, and to know the factors affecting their health and survival.
- To understand the economic value of forests and know many of the products they provide to people and society.

Total hours: 45 **Credits**: 5

UNIT I **(9 HOURS)**

General introduction to forests- Natural and man made; Tropical, temperate, evergreen, semi ever green and deciduous forests.

UNIT II: **(9 HOURS)**

Silviculture – concept, scope; clear felling, uniform shelter, wood selection, coppice and conservation systems. Silviculture of some of the economically important species in India- *Eucalyptus and Dalbergia sisso.*

UNIT III **(9 HOURS)**

Social and Agro forestry. Selection of species and role of multipurpose trees - Food, Fodder, energy and Avenue plantation. Sacred grooves – definition and importance. Significance of sacred trees - *Terminalia arjuna and Aegle marmelos.*

UNIT IV **(9 HOURS)**

Forest laws, necessity, General principles, Indian forest act 1927, Forest conservation act 1980, Wild life protection act 1972 and their amendments.

UNIT V **(9 HOURS)**

Forest resources and utilization. Definition and scope (brief outline). Major forest products - Timber- teak, Pulp wood - bamboo. Non-timber forest products (NTFPS)- Fruits, honey, Gums, resins, medicinal plants and canes – Marketing.

TEXTBOOKS

1. Sagreiya, K.P. 1994. Forests and Forestry (Revised by S.S. Negi). National book trust. New Delhi.
2. Tribhawan Mehta, 1981. A handbook of forest utilization. Periodical Expert Book Agency, New Delhi.
3. Sharma, P.D. 2004. Ecology and Environment 2004. Rastogi Publications, Meerut
4. Tiwari.K.M. 1983. Social forestry in India.

REFERENCES

1. Kollmann and Cote 1988. Wood Science and Technology. Vol.I & II Springer verlag.
2. Singh, M.P. and Vinita Vishwakarma.1997. Forest Environment and Biodiversity. Daya Publishing House, New Delhi
3. Gray L.Rolfe, Johan, M. Edging Ton, I. Irving Holland and Gayle C. Fortenberry. 2005. Forests and Forestry. International book distributing Co., Lucknow.
4. B.S.Chundawat & S.K. Gautams-1996. Textbook of Agroforestry. Oxford and IBH Publishing Co., Pvt. Ltd., Kolkatta

UBO-30
SEMESTER V
Elective - MEDICINAL PLANTS

Objectives

- To study the secondary metabolites in medicinal plants
- To analyze the cultivation and trading of medicinal plants.

Total hours: 45 **Credits**: 5

UNIT I **(9 HOURS)**

Ethnobotany – definition – categories – major tribes of south India – regional studies – ethno-medicinal plants – wild food plants – socio-economic status. Conservation of medicinal plants (*in situ, ex situ*, sacred grooves).

UNIT II **(9 HOURS)**

Pharmocognosy- definition and scope - the ancient and modern science (Sidha, Ayurveda, Unani and Homeopathy), classification of vegetable drugs, identification of drugs (Taxonomical, anatomical, fluorescence, chemicals, organoleptic, microscopic only).

UNIT III **(9 HOURS)**

Sources of vegetable drugs- biological geographical and cultural. Production of vegetable drugs- role of growth regulators. Deterioration of drugs and their control measures – adulteration of drugs.

UNIT IV **(9 HOURS)**

Importance and significance of Flavonaids and alkaloids, vitamins, hormones. Pesticides and antibiotics of plant origin.

UNIT V **(9 HOURS)**

Cultivation and trading of medicinal and aromatic plants –*Rauwolfia serpentina*, *Carica papaya*, *Cymbopogon martini*, *Aloe vera*, *Catharanthus roseus, Chrysanthemum cinnerarifolium* and *Phyllanthus emblica.*

TEXTBOOKS

1. Trease G.e. and Evans, W.C. 1978. Pharmocognosy. Bailliere Trinda, London.
2. Shah, C.S. and J.S. Qudry. 1995. A textbook Pharmocognosy. Prakasam Publishers, Ahamadabad.
3. Purohit, S.S. 1989. Medicinal plants cultivation – a scientific approach. Scientific Publishers, Jodhpur.
4. Jain, S.K. 1981. Glimpses of Indian Ethnobotany. Oxford and IBH, New Delhi.

REFERENCES

1. Anonymous. 1970. The Pharmacopoeia of India. Govt. of India, New Delhi.
2. Jain. S.K. (Ed.). 1996. Ethnobotany in human welfare. Deep. Pub. New Delhi
3. Nadkarni, K.M. 1954. Indian Materia Medica. Karnataka Printing press, Bombay
4. Wallis, T.E. 1985. Text Book of Pharmocognosy (5^{th} Ed). CBS Pub. Distributors. Bhola North nagar, New Delhi – 110 032.
5. Jain, S.K. 1990. Contribution Indian Ethnobotany. Scientific Publishers, Jodhpur.
6. Jothiprakash, E.J. 2006. Medicinal Botany and Pharmocognosy. Emky Publications, New Delhi.

UBO-31
SEMESTER- V

Elective – FOOD SCIENCE

Objectives

- To know about the food groups.
- To understand the food processing technology.

Total hours: 75 **Credits**: 5

UNIT I **(15 HOURS)**

Food groups: basic groups- basic four, five and seven, food inn relation to health. Preliminary preparation of food- cleaning, cleaning, peeling, stinging, cutting and grating, soaking, marinating, sprouting, fermenting, grinding, drying and filtering their advantages and disadvantages.

UNIT II **(15 HOURS)**

Cereals and cereal products, structure and composition and nutritive value of cereals - wheat and wheat products; fermented and unfermented products.

UNIT III **(15 HOURS)**

Biotechnology in food - biofertification, nutraceuticals, space food. Fruits and vegetables - classification, composition and nutritive value. Milk & milk products - processing, clarification, pasteurization and homogenization. Tea processing and marketing.

UNIT IV **(15 HOURS)**

Food preservation by high and low temperatures- outline. Preservation by high osmotic pressure, high concentration of sugar, jam and jelly preparation. High concentration of salts. Principles and preparation of pickles- preservation by dehydration. Principles and methods of drying such as freeze drying, sun drying, mechanical driers - spray drying and foam mat drying and by smoking.

UNIT V **(15 HOURS)**

Packing of food- classification of package, materials used for packing, active food packing, packing of fruits and vegetables. Nutrition labeling – guiding principles, codex Guidelines. Some recent development on the food labeling front in India

TEXTBOOKS

1. Srilakshmi, B. 2003. Food science. New Age International Pvt. Ltd.
2. James, M. Jay. 1987. Modern Food Microbiology. CBS, Mylapore, Chennai.

REFERENCES

1. Subbulakeshmi, G. 2003. Food processing and preservation. New Age International Pvt. Ltd.
2. Srilakshmi, B. 2005. Food and Health. National Institute of Nutrition, ICMR, Hyderabad.
3. Janet, D Ward and T. Larry. 2002. Principles of Food Science. Good Heart, Wilcox, Illinois.

UBO-32

SEMESTER- VI
Elective - SEED BIOLOGY

Objectives

- To study the structure of dicot & Monocot seeds and analyze various materials (fibres) produced by seeds.
- To analyze the germination of seeds.

Total hours: 75 **Credits**: 5

UNIT– I (15 HOURS)

Scope of seed biology – Structure of monocot and dicot seeds / grains. Albuminous (endospermic) and ex – albuminous (non-endospermic) seeds. Chemical composition – cereals (Paddy) – Oil seed (Castor) – Fibre (Cotton) and Pulses (*Dolichos*).

UNIT- II (15 HOURS)

Seed germination: Factors affecting germination. Methods of germination test (using paper, sand and soil) – Seed viability, (Tetrazolium Test), vigour (Direct and Indirect test). Concept of seed vigour.

UNIT- III (15 HOURS)

Seed drying, Process and Equipments. Methods of moisture determination of seed. Seed cleaning and upgrading – Equipments involved. Seed testing and quality control.

UNIT- IV (15 HOURS)

Seed treatment – Pelleting and their significance, packaging, storage and marketing.

UNIT- V (15 HOURS)

Seed dormancy: Primary and Secondary dormancy – significance – Factors involved – methods used to break dormancy.

TEXTBOOKS

1. Agarwal R. L. (1982). Seed Technology –. Oxford and IBH Publishing Company, New Delhi.
2. Bewley, J.D and M. Black (1978).Seed Biology Vol. I & II Academic press, New York

REFERENCES

1. Bewley, J.D and M. Black. (1985). (Eds.) Seeds; Physiology of development and germination Plenum Press: New York.
2. Murray, D.R. (1984). (Ed.) Seed physiology Vol I & II Academic Press: Sydney – New York- London
3. Khan, A.A. (Latest Edition) (Ed.). The physiology and Biochemistry of seed Dormancy and germination. North-Holland Publishing Company: Amsterdam- New York- Oxford.
4. Mehta S.L. Lodha, M.L. and Sane P.V. (1993). (Eds.) Recent advances in Plant Biochemistry. Publication and information division ICAR, New Delhi.

UBO-33

SEMESTER VI

Elective – BIOTECHNOLOGY

Objectives

- To know the principles employed in the production of bioproducts.
- To have the comprehensive understanding about the tools available for the production of biogoods.

Total hours: 75 **Credits**: 5

UNIT I (15 HOURS)

History, scope, importance and basic branches. Genetic engineering - gene cloning procedure, isolation of specific genes, Enzymes used in gene cloning - polymerases, restriction endonucleases, ligases and reverse transcriptase.

UNIT II (15 HOURS)

Vectors for gene cloning - plasmids, phages, cosmids, BAC and YAC. Gene cloning in *Agrobacterium.*. Methods of direct gene transfer - electroporation, micro injection and liposomes mediated DNA delivery. Genetically Engineered Microorganisms-Insulin producing *E. coli*.

UNIT III (15 HOURS)

Basic techniques and working principles of PCR, and DNA finger printing techniques. Blotting techniques - Southern, Northern and Western, agarose gel electrophoresis; Monoclonal Antibodies.

UNIT IV (15 HOURS)

Biofertilizers – Advantages, mass cultivation and application techniques of *Rhizobium*, and *Azosprillum*. Blue green algae (*Nostoc*), Phosphobacteria, *Azolla* and VAM.

UNIT V (15 HOURS)

Wastewater treatment, recycling water for food and feed. Treatments of paper and distillery effluents - oxidation ponds. Source of alternate fuel - Biomass and bioenergy production of biogas and its advantage. Photo biological production of hydrogen. Petrochemical plants.

TEXTBOOKS

1. Dubey. R.C. 1996. A Text Book of Biotechnology. Rastogi Publications, Meerut.
2. Kumaresan, V.K. Biotechnology. 2003. Saras Publications, Kanyakumari.

REFERENCES

1. Ignacimuthu, S. 1996. Applied Plant Biotechnology. Tata McGraw Hill Publishing Company Ltd., New Delhi.
2. Ignacimuthu, S. 1996. Basic Biotechnology. 1996. Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Ignacimuthu, S. 1997. – Plant Biotechnology. Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. Gupta, P.K. 2004. Elements of Biotechnology, 2004. Rastogi Publications, Meerut.
5. Chhatwal. 1995. Text book of biotechnology. Anmol Publications Pvt. Ltd., New Delhi.

UBO-34

SEMESTER- VI

Elective – PHARMACOGNOSY

Objectives

- To study the drug development from plants.
- To understand the traditional systems of medicines like Ayurveda, Siddha & Unani.

Total hours: 75 **Credits**: 5

UNIT I **(15 HOURS)**

Definition History and scope of Pharmocognosy. Study of various system of classification of drugs. Traditional system of medicines (Siddha, Ayurveda and Unani).

UNIT II **(15 HOURS)**

A general survey of biological sources, Geographical sources and cell cultures in the production of drugs. Factors involved in the production of drugs.

UNIT III **(15 HOURS)**

Pharmacological action of plant drugs - act on central nervous system- Lysergic acid Diethylomids, cannabis, Cocaine and reserpine. Action on heart muscles - Digitalis, Quinidine, Papaverine and Ergotamine

UNIT IV **15 HOURS)**

Kinds of drugs of plant origin. Phenols, Resins, Alkaloids and Vitamins.

UNIT V **(15 HOURS)**

Organized natural products – wood and bark. Quassia and Cinchona.
Leaves and Flowers - Adhathoda and clove Seed and fruits- Fennel, Nutmeg. Unorganized products - Acacia gum, castor oil

TEXT BOOKS

1. Pharmocognosy by G.E. Trease and W. C Evans 1983 ELBS, Britain
2. Medical microbiology 1983 Churchill Livingstone ELBS Britain.

REFERENCES

1. A dictionary of terms used in Pharmocognosy by Hocking, G.M. 1955. Spring Field.
2. Marine Pharmacology ballow M H 1969. Williams and Wilkins.
3. Poisonous plants of India by Chopra, R.N, Badhwa, R. L and Ghosh, S. 1965. Govt. of India Press.

EXTRA DEPARTMENTAL COURSE (EDC) PAPER

UBO-35

SEMESTER V **16UBO5X1**

EDC - MEDICINAL BOTANY AND HUMAN WELFARE

Objectives:

- To study the Indian system of medicines.
- To gain the knowledge about morphology, histology and uses of medicinal plants.

Total hours: 30 **Credits**: 3

Unit-I **(6 Hours)**

Indian systems of medicine, Siddha, Ayurvedha and Unani systems. Classification of crude drugs and evaluation of drugs. Drug aldulteraton.

Unit-II **(6 Hours)**

Morphological and histological studies Chemical constituents. Therapeutic and other pharmaceutical uses of bark – *Cinchona*, Leaves – *Adathoda* and Flower-*clove*.

Unit-III **(6 Hours)**

Fruits and seeds - Gooseberry and poppy seeds, Underground stem-ginger- Unorganized drugs. Gum - Gugul, Resin - Ferula, Fixed oil- Castor oil.

Unit-IV **(6 Hours)**

A brief account of the following: a) Drugs acting on the central nervous system, b) Drugs used in the disorders of the gastro-intestinal tract and c) Cardio vascular drugs.

Unit-V **(6 Hours)**

Botanical features, medicinal uses and cultivation of medicinal plants – *Emblica, Artimissia* and *Rauvolfia.*

REFERENCE:

1. Pharmacognosy -G-1, Trease and Evans 1978, Baillere Tindall London.
2. Text book of Pharmacognosy -T.E.Wallis Fifth Edition.Publishers- CBS publishers and distributions Delhi.
3. Pharmacognosy -S.S Handa and V.K. Kapoor. Second Edition.Publishers-CBS Publishers and Distributors, Delhi.
4. An introduction to Medical Botany and Pharmacognosy - N.C. Kumar 1993. Emky Publications, New Delhi.
5. Hand Book of Medicinal Plants, Pointers Publishers, Jaipur.
6. Pharmacognosy -C.K. Kokate, A.Purohit and S.R. Gokhale 12th Edition Publishers Nirali Prakashan. Pune.

GENERAL SUBJECTS

UBO-36

Part IV – I SEMESTER **15EVS101**

ENVIRONMENTAL STUDIES

Total Credits: 2 **Total Hours : 30**

Objectives

1. To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
2. To shape students into good "ecocitizens", thereby catering to global environmental needs.

UNIT I MULTIDISCIPLINARY NATURE OF ENVIRONMENT 6 Hrs

1.1 Definition : scope and importance

1.2 Need for public awareness*

1.3 Natural resources

1.3.1 Types of resources

Forest Resources – Water Resources – Mineral Resources – Food Resources – Energy Resources – Land Resources.

UNIT II ECOSYSTEMS 6 Hrs

2.1 Concept of an ecosystem

2.2 Structure and functions of an ecosystem

2.3 Producers, consumers and decomposers

2.4 Energy flow in the ecosystem

2.5 Ecological succession

2.6 Food chains, food web and ecological pyramids

2.7 Structure and function of the following ecosystem*

Forest Ecosystem – Grassland Ecosystem – Desert Ecosystem – Aquatic Ecosystem.

UNIT III BIODIVERSITY AND ITS CONSERVATION 6 Hrs

3.1 Introduction – Definition – Genetic – Species and ecosystem diversity

3.2 Biogeographical classification of India

3.3 Value of biodiversity*

3.4 Biodiversity at global, national and local levels

3.5 India as a mega – diversity Nation

3.6 Hot spot of biodiversity

3.7 Threats to biodiversity

3.8 Endangered and endemic species of India

3.9 Conservation of Biodiversity

In situ Conservation of Biodiversity – *ex situ* Conservation of Biodiversity

UNIT IV ENVIRONMENTAL POLLUTION 6 Hrs

4.1 Definition

4.2 Causes, effects and control measures of: Air Pollution – Water Pollution – Soil Pollution – Marine Pollution – Noise Pollution – Thermal Pollution – Nuclear Pollution.

4.3 Solid Waste Managements: causes, effects, control measures of urban and industrial wastes.

4.4 Role of individual in prevention of pollution*.

4.5 Pollution case studies – domestic waste water, effluent from paper mill and dyeing, cement pollution.

4.6 Disaster Management – Flood, Drought, Earthquake, Tsunami, Cyclone and Landslide.

UNIT V SOCIAL ISSUES AND THE ENVIRONMENT 6 Hrs

5.1 Sustainable Development

5.2 Urban problems related to energy

5.3 Water Conservation : Rain Water Harvesting and Watershed Management

5.4 Resettlement and rehabilitation of people, its problems and concerns, case studies – Narmatha Valley Project.

5.5 Environmental ethics, issues and possible solutions.

5.6 Climatic change, global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust, case studies – Hiroshima and Nagasaki, Chernobyl.

5.7 Consumerism and waste products

5.8 Environmental Protection Act

5.9 Air Pollution Act (Prevention and Control)

5.10 Water Pollution Act (Prevention and Control)

5.11 Wild Life Protection Act

5.12 Forest Conservation Act

5.13 Issues involved in enforcement of environmental legislation

5.14 Public awareness*

5.15 Human population and the environment

5.15.1 Population Growth and Distribution

5.15.2 Population Explosion – Family Welfare Programme*

5.15.3 Environment and Human Health

5.15.4 Human Rights*

5.15.5 Value Education*

5.15.6 HIV / AIDS*

5.15.7 Women and Child Welfare

5.15.8 Role of Information Technology in Environment and Human Health*.

*** Self Study (Questions may be asked from these topics also)**

Text Book

1. P.Arul, A Text Book of Environmental Studies, Environmental Agency, No 27, Nattar street, Velacherry main road, Velacheery, Chennai – 42, First Edition, Nov. 2004.

References

1. Purohit Shammi Agarwal, A text Book of Environmental Sciences, Publisher Mrs. SaraswatiProhit, Student Edition, Behind Naswan Cinema Chopansi Road, Jodhpur.
2. Dr.Suresh and K.Dhameja, Environmental Sciences and Engineering, Publisher S.K.Kataria& Sons, 424/6, Guru Nanak Street, Vaisarak, Delhi – 110 006.
3. J.Glynn Henry and Gary W Heinke, Environmental Science and Engineering, Prentice Hall of India Private Ltd., New Delhi – 110 001.

*** Self Study (Questions may be asked from these portions also)**

Question Paper Pattern
(External only)

Duration: 3 hours Total Marks : 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

UBO-37

SEMESTER – II **15VED201**

PART IV VALUE EDUCATION – MORAL AND ETHICS

Total hours: 30 **Credits: 2**

UNIT I

Introduction to Moral and Ethics; Aim of Education (6 Hours)

UNIT II

Ethics and Culture (6 Hours)

UNIT III

Early Life of Swami Vivekananda (6 Hours)

UNIT IV

The Parliament of Religions (6 Hours)

UNIT V

Teachings of Swami Vivekananda (6 Hours)

Text Book:

Value Based Education - Kongunadu Arts and Science College, Coimbatore, First Edition, 2014.

References :

1. **Moral and Ethics** - Published by Dr.M.Aruchami, Secretary and Director, Kongunadu Arts and Science College, Coimbatore, First Edition, June 2007.

2. **"Vivekananda A Biography"** - Swami Nikilananda, 29th Reprint, January 2013, Published by Swami Bodhasarananda, Adhyaksha, Advaita Ashrama, Mayavati, Champawat, Uttarakhand, Himalayas.

Question Paper Pattern

(External only)

Duration: 3 hours Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

UBO-38 **16UHR3N1**

Part IV – III Semester

Non- Major Elective - I "Human Rights"

Total Credits: 2 **Total Hours :30**

Objectives

1. To impart knowledge of human values, ethics and human rights to the students.
2. To reinforce positive personality traits and enhance physical, mental, social ethical and spiritual well-being of the students.

UNIT I **6 Hrs**

Concept of Human Values, Value Education towards Personal Development

Aim of education and value education; Evolution of value-oriented education; Concept of human values; types of values; Components of value education.

Personal Development:

Self-analysis and introspection; sensitization towards gender equality, physically-challenged, intellectually-challenged. Respect to - age, experience, maturity, family members, neighbours, co-workers.

Character Formation towards Positive Personality:

Truthfulness, Constructivity, Sacrifice, Sincerity, Self-Control, Altruism, Tolerance, Scientific vision**.**

UNIT II **6 Hrs**

Value Education towards National and Global Development National and International Values

Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom and fraternity.

Social Values - Pity and probity, self-control, universal brotherhood.

Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith.

Religious Values - Tolerance, wisdom, character*.

Aesthetic Values - Love and appreciation of literature and fine arts and respect for the same.

National Integration and international understanding.

UNIT III **6 Hrs**

Impact of Global Development on Ethics and Values

Conflict of cross-cultural influences, mass media, cross-border education, materialistic values, professional challenges and compromise.

Modern challenges of adolescent emotions and behaviour; sex and spirituality: comparison and competition; positive and negative thoughts.

Adolescent emotions, arrogance, anger, sexual instability, selfishness, defiance.

UNIT IV **6 Hrs**

Therapeutic Measures

Control of the mind through

a. Simplified physical exercise
b. Meditation – objectives, types, effect on body, mind and soul
c. Yoga – objectives, types, Asanas
d. Activities:*
   (i) Moralisation of Desires
   (ii) Neutralisation of Anger
   (iii) Eradication of Worries
   (iv) Benefits of Blessings

UNIT V **6 Hrs**

Human Rights

1. Concept of Human Rights – Indian and International Perspectives
   a. Evolution of Human Rights
   b. Definitions under Indian and International documents
2. Broad classification of Human Rights and Relevant Constitutional Provisions.
   a. Right to Life, Liberty and Dignity
   b. Right to Equality
   c. Right against Exploitation
   d. Cultural and Educational Rights
   e. Economic Rights
   f. Political Rights
   g. Social Rights
   h. Rights to Information
3. Human Rights of Women and Children
   a. Social Practice and Constitutional Safeguards
      (i) Female Foeticide and Infanticide
      (ii) Physical assault and harassment
      (iii) Domestic violence
      (iv) Conditions of working women

4. Institutions for Implementation
    a. Human Rights Commission
    b. Judiciary
5. Violations and Redressal
    a. Violation by State
    b. Violation by Individuals
    c. Nuclear weapons and terrorism
    d. Safeguards

* **Self-study(Questions may be asked from these topics also)**

Prescribed Book : Human Rights, Compiled by Bharathiar University, Coimbatore - 46

UBO-39 **16UWR4N2**

Part IV – IV SEMESTER

Non-Major Elective - II "Women's Rights"

Total credits: 2 **Total Hours: 30**

Objectives

1. To impart specific and up-to-date information about national and international laws related to the welfare of women.
2. To create awareness about crimes against women, legal rights of women in the country and access to justice.

UNIT I LAWS, LEGAL SYSTEMS AND CHANGE 6 Hrs

Definition - Constitutional law, CEDAW and International Human Rights – Laws and Norms – Laws and Social Context – Constitutional and Legal Framework.

UNIT II POLITICS OF LAND AND GENDER IN INDIA 6 Hrs

Introduction – Faces of Poverty – Land as Productive Resources – Locating Identities – Women's Claims to Land – Right to Property - Case Studies.

UNIT III WOMEN'S RIGHTS: ACCESS TO JUSTICE 6 Hrs

Introduction – Criminal Law – Crime against Women – Domestic Violence – **Dowry Related Harassment* and Dowry Deaths*** – Molestation – Sexual Abuse and Rape – Loopholes in Practice – Law Enforcement Agency.

UNIT IV WOMEN'S RIGHTS 6 Hrs

Violence Against Women – Domestic Violence - The Protection of Women from Domestic Violence Act, 2005 - The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961

UNIT V SPECIAL WOMEN WELFARE LAWS 6 Hrs

Sexual Harassment at Work Places – Rape and Indecent Representation – The Indecent Representation (Prohibition) Act, 1986 - Immoral Trafficking – The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment - Role of Rape Crisis Centers.

* **Self-study (Questions may be asked from these topics also)**

Prescribed Book: Women's Rights Compiled by Kongunadu Arts and Science College, Coimbatore-29.

References

1. NityaRao "Good Women do not Inherit Land" Social Science Press and Orient Blackswan 2008
2. International Solidarity Network "Knowing Our Rights" An imprint of Kali for Women 2006
3. P.D. Kaushik "Women Rights" Bookwell Publication 2007
4. Aruna Goal "Violence Protective Measures for Women Development and Empowerment" Deep and Deep Publications Pvt. 2004
5. Monica Chawla "Gender Justice" Deep and Deep Publications Pvt. Ltd.2006
6. Preeti Mishra "Domestic Violence Against Women" Deep and Deep Publications Pvt. 2007
7. Clair M. Renzetti, Jeffrey L. Edleson, Raquel Kennedy Bergen, Source Book on "Violence Against Women" Sage Publications 2001.

NON-MAJOR ELECTIVES I & II
(2012 - 2013 onwards)

QUESTION PAPER PATTERN

Duration: 3 Hours **Max. Marks: 75**

Answer ALL Questions

SECTION A (5 x 5 = 25 marks)

Short answers, either or type, one question from each unit.

SECTION B (5 x 10 = 50 marks)

Essay type questions, either or type, one question from each unit.

QUESTION PAPER PATTERNS

UBO-40

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

UG MODEL QUESTION PAPER (THEORY)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Marks:** 75 Marks

Answer all the following questions

SECTION – A **(10 × 1 = 10)**

(10 questions)

(Two questions from each UNIT. Questions shall be in the form of Multiple Choices)

SECTION – B **(5 × 5 = 25)**

Five questions either or type

(One question from each UNIT)

SECTION – C **(5 × 8 = 40)**

Five questions either or type

(One question from each UNIT)

TOTAL **75 Marks**

UBO-41

SEMESTER VI **15UBO6Z1**

PROJECT WORK AND VIVA-VOCE

MARKS DISTRIBUTION

	Marks
Project Report	**60**
Viva-Voce	**20**
Internal	**20**
Total	**100**

UBO-42

KONGUNADU ARTS AND SCIENCE COLLEGE (Autonomous)

COIMBATORE – 641 029

ALLIED UG MODEL QUESTION PAPER (THEORY)

End semester Examination Question Paper Pattern

(For the candidates admitted from the academic year 2016-17 onwards)

Time: 3 Hours **Marks:** 55 Marks

Answer all the following questions

SECTION – A **(10 × 1 = 10)**

(10 questions)

(Two questions from each UNIT. Questions shall be in the form of Multiple Choices)

SECTION – B **(5 × 3 = 15)**

Five questions either or type

(One question from each UNIT)

SECTION – C **(5 × 6 = 30)**

Five questions either or type

(One question from each UNIT)

TOTAL **55 Marks**