**BHARATHIAR UNIVERSITY, COIMBATORE**
**B.Sc. BIOTECHNOLOGY DEGREE COURSE**
**SCHEME OF EXAMINATION - CBCS PATTERN**

**For the students admitted during the academic year 2011– 2012 batch onwards**

| Part | Study Components | Course title | Ins. hrs/ week | Examinations | | | | Credit |
|---|---|---|---|---|---|---|---|---|
| | | | | Dur.Hrs. | CIA | Marks | Total Marks | |
| | **Semester I** | | | | | | | |
| I | Language – I | | 6 | 3 | 25 | 75 | 100 | 4 |
| II | English – I | | 6 | 3 | 25 | 75 | 100 | 4 |
| III | Core Paper I - Cell biology | | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Paper II - Biochemistry | | 4 | 3 | 25 | 75 | 100 | 4 |
| | Practical I (Cell Biology & Biochemistry) | | 2 | - | - | - | - | - |
| | Allied A : Chemistry I | | 4 | 3 | 20 | 55 | 75 | 3 |
| | Allied Practical | | 2 | - | - | - | - | - |
| IV | Environmental Studies # | | 2 | 3 | - | 50 | 50 | 2 |
| | | | | | | | | |
| | **Semester II** | | | | | | | |
| I | Language – II | | 6 | 3 | 25 | 75 | 100 | 4 |
| II | English – II | | 6 | 3 | 25 | 75 | 100 | 4 |
| III | Core Paper III - Microbiology | | 5 | 3 | 20 | 55 | 75 | 3 |
| | Core Practical I (Cell Biology & Biochemistry) | | 4 | 3 | 40 | 60 | 100 | 4 |
| | Allied A : Chemistry II | | 4 | 3 | 20 | 55 | 75 | 3 |
| | Allied Practical (Chemistry) | | 3 | 3 | 20 | 30 | 50 | 2 |
| IV | Value Education – Human Rights # | | 2 | 3 | - | 50 | 50 | 2 |
| | | | | | | | | |
| | **Semester III** | | | | | | | |
| I | Language – III | | 6 | 3 | 25 | 75 | 100 | 4 |
| II | English – III | | 6 | 3 | 25 | 75 | 100 | 4 |
| III | Core Paper IV - Bioinstrumentation | | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Paper V- Genetics | | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Practical II | | 2 | - | - | - | - | - |
| | Allied B: Paper I – Basic Mathematics | | 3 | 3 | 20 | 55 | 75 | 3 |
| IV | Skill based Subject 1 - Human Physiology | | 3 | 3 | 20 | 55 | 75 | 3 |
| | Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence# / Women's Rights#/ Constitution of India #) | | 2 | 3 | 50 | | 50 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Semester IV** | | | | | | |
| I | Language – IV | 6 | 3 | 25 | 75 | 100 | 4 |
| II | English – IV | 6 | 3 | 25 | 75 | 100 | 4 |
| III | Core Paper VI-Immunology | 4 | 3 | 20 | 55 | 75 | 3 |
| | Core Practical – II (Microbiology & Genetics) | 3 | 3 | 40 | 60 | 100 | 4 |
| | Allied B : Paper II – Computer applications | 4 | 3 | 20 | 55 | 75 | 3 |
| | Allied Practical (Computer applications)) | 2 | 3 | 20 | 30 | 50 | 2 |
| IV | Skill based Subject 2 -Human Pathology | 3 | 3 | 20 | 55 | 75 | 3 |
| | Tamil @ /Advanced Tamil # (OR)<br>Non-major elective -II (General Awareness#) | 2 | 3 | 50 | | 50 | 2 |
| | | | | | | | |
| | **Semester V** | | | | | | |
| III | Core paper VII Plant & Animal Biotechnology | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Paper VIII Molecular Genetics | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Paper IX Environmental Biotechnology | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Paper X rDNA technology | 4 | 3 | 25 | 75 | 100 | 4 |
| | Core Practical III Immunology and Plant Tissue Culture | 4 | - | - | - | - | - |
| | Core Practical IV Microbial Biotechnology & rDNA technology | 3 | - | - | - | - | - |
| | Elective 1 | 4 | 3 | 25 | 75 | 100 | 4 |
| IV | Skill based Subject 3 Diagnostic tools | 3 | 3 | 20 | 55 | 75 | 3 |
| | | | | | | | |
| | **Semester VI** | | | | | | |
| III | Core Paper XI – Microbial Biotechnology | 5 | 3 | 25 | 75 | 100 | 4 |
| | Core Practical III- Applied Biotechnology | 6 | 3 | 40 | 60 | 100 | 4 |
| | Core Practical IV Microbial Biotechnology & rDNA technology | 6 | 6 | 40 | 60 | 100 | 4 |
| | Elective – II | 5 | 3 | 25 | 75 | 100 | 4 |
| | Elective – III | 5 | 3 | 25 | 75 | 100 | 4 |
| IV | Skill Based Subject 4 - Pharmacology | 3 | 3 | 20 | 55 | 75 | 3 |
| V | Extension Activities @ | - | - | 50 | - | 50 | 2 |
| | Total | | | | | 3500 | 140 |

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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| List of Elective papers (Colleges can choose any one of the paper as electives) | | |
|---|---|---|
| Elective – I | A | Agricultural Biotechnology |
| | B | Bioremediation |
| | C | Introduction to Bioinformatics |
| Elective – II | A | Medical Biotechnology |
| | B | Biotechnological approach for waste water treatment |
| | C | Genomics |
| Elective - III | A | Industrial Biotechnology |
| | B | Bioethics & Biosafety |
| | C | Proteomics |

**Note :**

1. The syllabus for the above papers (except Skill based subject – Human Physiology and Core Paper IX – Environmental Biotechnology) be the same as prescribed for the academic year 2010-11. The existing Diploma papers are renamed as Group Elective papers.

2. The syllabus for the Skill based subject – Human Physiology and Core Paper IX – Environmental Biotechnology are furnished below.

## Skill Based Subject 1
## Subject Title: HUMAN PHYSIOLOGY

**Subject description**: This course presents the various physiological activities in human being
**Goals:** To make the student to understood the human physiology

**Objectives**:
After the completion of the course the student should have understood the various systems in human body and their activities

UNIT I
Muscle- skeletal muscles – composition – functions and properties of plain (smooth) and cardiac muscles – electromyography
Nervous System – organization – basic functions of synapses and transmitter substances – sensory receptors – sense of hearing – taste and smell. Special senses – optics of vision – function of retina –cortical and brain stem control of motor function. cerebrospinal and brain metabolism

UNIT II
Blood & Body Fluid – blood cell –Haematosis – determination of coagulation – plasma proteins – platelets – leucocytes. Bone marrow – functions of tissue fluid – Lymph nodes
Cardio Vascular System – Heart as pump – rhythmic excitation – electrocardiogram.
Respiratory System- pulmonary ventilation – pulmonary circulation – gaseous exchange - $O_2$ and $CO_2$ transport in blood and body fluids – mechanism of breathing - ventilation

UNIT III
Digestive System – digestive tract – gastrointestinal function – motility– secretory functions of alimentary tract – digestion and absorption.
Excretion – functions of kidney – renal associated mechanisms - extra cellular and intracellular fluids – osmalality, Micturition – skin – sweat
Endocrines – pituitary hormones and their control by hypothalamus – thyroid metabolic hormones – adreno-cortical hormones – insulin, glucagons and Diabetes mellitus –. Gonadotrophic hormones –testosterone – estrogen.
REFERENCES:
1. Text book of Medical physiology by Guyton . 8th edition . W B Saunders company. USA
2. Human physiology by Dr.C.Chatterjee I & II. Medical Allied Agency, Kolkatta.

3. Anthony's Text book of Anatomy and Physiology by Gary A. Thiodeare & Kevin T Patton, 2nd edition. Moshi year book, New York
4. Anatomy and Physiology by Ross & Wilson 8th edition. Churchill Livingstone
5. Human physiology by Sarada Subramaniam & K.MadhavanKutty. S.Chand and company, New Delhi
6. Human Physiology by Vander Sherman Luciano McGraw Hill NewYork.

## CORE PAPER: IX
## Subject Title: ENVIRONMENTAL BIOTECHNOLOGY

**Subject description:** This course presents the Study and the Management of the Environment

**Goals**: To make the student to understood Ecology and Conservation of the Environment

**Objectives:** On successful completion of the subject the student should have understood Ecosystem, energy flow and Uses and values of Biodiversity.

UNIT I:
Scope – Branches of ecology – Abiotic factors – water – soil – temperature – light. Biotic factors – Animal relationship – symbiosis – commensalisms – mutalism –Antagonism – Antibiosis – Parasitism – Predation – competition.

UNIT II:
Ecosystem –Definition –structure – pond ecosystem – primary production –secondary production – food chain – food web – trophic levels – energy flow – pyramid of biomass– pyramid of energy. Biogeochemical cycle: Nitrogen and Phosphorous.

UNIT III:
Pollution – types – sources – effects – Air-water – land – Noise – Thermal – Pesticide – Radioactive – green house effect, ozone and its importance – global warming – Acid rain– Bio accumulation – Bio magnification. Biological control. Principles of environment Impact. Assessment and environmental monitoring.

UNIT IV:
Sewage Treatment System – Characteristics, Primary, secondary and tertiary treatment
Industrial waste water treatment system – Tannery and Distillary waste water
Solid waste disposal and solid waste Management.

UNIT V:
Uses and values of Biodiversity -A very general account on uses of Bioresources-plant uses: food, timber, medicinal ornamental and other uses- animal uses: food animals (terrestrial and aquatic), non food uses of animals, Domestic livestock-uses of microbes. Valuing Biodiversity-Instrumental (Goods, Services, and Information and Psychospiritual

values) and Inherent or Intrinsic values, ethical and aesthetic values, Biotechnology and Intellectual property rights

REFERENCES:

1. Groombridge, B (Ed.) 1992. Global Biodiversity – Status of the Earth's Living Resources. Chapman & Hall, London.
2. UNEP, 1995, Global Biodiversity Assessment, Cambridge Univ. Press, Cambridge.
3. Virchow, D. 1998. Conservation & Genetic Resources, Springer – Verlag, Berlin.
4. Gary K.Meffe & .Ronald Carroll, C.1994. Principles of Conservation Biology, SinauerAssociates, Inc., Massachusetts.
5. Clarke, G.L. 1954, Elements of ecology, John Wiley & sons. N.Y.
6. Kendeigh, S.c. 1961. Animal Ecology. Prentice Hall.
7. Odum, E.P. 1971. Fundamentals of Ecology. W.B.Saunders company,
8. Philadelphia.
9. Rastogi, V.B. and M.S. Jayaraj, 1989. Animal ecology and distribution of
10. Animals, Kedamath Ramnath.
11. Sharma, P.D. 1990. Ecology and environment. Rsatogi publications, Meerut.
12. Southwick, C.H. 1976. Ecology and the quality of environment D.Van.Nostrand Co.,
13. Verma P.S. and V.K. Agarwal. 1996. Principles of Ecology S.Chand. & co., New Delhi.