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Item No. 4.5

UNIVERSITY OF MUMBAI

Revised Syllabus for F.Y.B.Sc.
Program: B.Sc.
Course: BIOTECHNOLOGY (USBT)

(Credit Based Semester and Grading System with effect from the academic year 2014–2015)

PREAMBLE

With the introduction of Credit based Semester and Grading System(CBSGS) and continuous evaluation consisting of Internal Assessment and External Assessment by the esteemed University from the academic year 2011-2012, the earlier existing syllabus of F. Y. B.Sc. Biotechnology was restructured according to the CBSGS pattern for its implementation from 2011-2012.

Now the existing syllabus of F. Y. B.Sc. Microbiology is due for revision as per the CBSGS pattern for its implementation from the academic year 2014-2015.

While revising the syllabus, the Ad-hoc Board and the committee has taken utmost care to balance both the basic techniques and the advance techniques. Advanced techniques would be introduced phase manner at S. Y. B. Sc and T. Y. B. Sc. level in Biotechnology

Biotechnology is an interdisciplinary subject. The basic concepts in Microscopy, stains and staining procedures as well as cultivation of Microorganisms have been introduced. The knowledge of Bio-molecules and ultra-structure of both prokaryotic and eukaryotic cells is very essential and hence the learner has been introduced to these concepts. It was thought that a learner should review the history and also get exposed to the modern processes in Biotechnology. At the same time a perspective of different stake holders such as scientists, layman, and consumer is essential to be understood before dealing with the subject. Hence a learner would be taught this aspect.

Bio-molecules play a major role in activity of the cell. All the four major Bio-macromolecules have remarkable and diverse properties. A learner would be exposed to the structure and functions of these Bio-molecules. The knowledge of structure and function of major cellular structures in both prokaryotic and eukaryotic cells has been introduced at the entry point with the view that a learner would get a fair idea about cellular functions of these organelles. It is essential to have a clear idea of controlling the organisms, in terms of chemical and physical agents and the module has been included in the revised syllabus.

F.Y.B.Sc Biotechnology Syllabus
Revised for Credit Based Semester & Grading System
To be implemented from the Academic year 2014-15

Bachelor of Science in Biotechnology	**Duration: Six Semesters**	
	SEMESTER I	
Course Code	**Title**	**Credits**
USBT-101 Theory	**FUNDAMENTALS OF BIOTECHNOLOGY**	**2 Credits (45 lectures)**
Unit-I	History, Introduction, and perspective of Biotechnology	15 lectures.
Unit-II	Basic Microscopy	15 lectures.
Unit-III	Stains and Staining Procedures.	15 lectures.
USBT-102 Theory	**APPLICATIONS OF BIOTECHNOLOGY**	**2 Credits (45 lectures)**
Unit-I	Biomolecules I	15 lectures.
Unit-II	Procaryotic and Eucaryotic Cell Structure	15 lectures.
Unit-III	Microbial Nutrition, Cultivation, Isolation & Preservation	15 lectures.
USBTP-1	**PRACTICALS**	**2 Credits**
	SECTION-1 **FUNDAMENTALS OF BIOTECHNOLOGY.** **(Practicals Based On Unit-I,II & III Of USBT-101**	**1 Credit (45 lectures)** **2**
Unit-I	History, Introduction & Scope Of Biotechnology	
Unit-II	Basic Microscopy	
Unit-III	Stains and Staining Methods	
	SECTION-2 **APPLICATIONS OF BIOTECHNOLOGY** **(Practicals Based On Unit-I,II & III Of USMB-102**	**1 Credit (45 Lectures)**
Unit-I	Biomolecules I	
Unit-II	Procaryotic and Eucaryotic cell structure	
Unit-III	Microbial Nutrition, Cultivation, Isolation &	

F.Y.B.Sc Biotechnology Detail Syllabus
Revised for Credit Based Semester & Grading System
To be implemented from the Academic year 2014-15

Bachelor of Science in Biotechnology	**Duration: Six Semesters**	
	SEMESTER I	
Course Code	**Title**	**Credits**
USBT-101 Theory	**FUNDAMENTALS OF BIOTECHNOLOGY**	**2 Credits (45 lectures)**
Unit-I	**History, Introduction & Scope Of Biotechnology** 1.1 What is Biotechnology? Definition of Biotechnology, Traditional and Modern Biotechnology, Different Branches of Biotechnology- Pharmaceutical Biotechnology, Plant, Animal Biotechnology, Marine Biotechnology, Industrial Biotechnology, 1.2 Biotechnology in Health care, Public perception of Biotechnology, 1.3 Biotechnology in India and world view, Ethical issues in Biotechnology.	15 lectures.
Unit-II	**Basic Microscopy** 1.1 History of Microscope, Bright Field Microscopy, Light microscope, Compound microscope, Parts of Light microscope – ocular, objectives, mirrors, condensers, Numerical aperture, Resolving power, Magnification. 1.2 Dark field microscopy, 1.3 Phase Contrast Microscopy, 1.4 Fluorescent Microscopy – Principle, working and applications.	15 lectures.
Unit-III	**Stains and Staining Methods**. **1.1** Definition of Dye, Chromogen, Auxochrome and Chromophore groups**.** 1.2 Preparation of and staining of specimens, fixation, Simple stains, Leuco compounds, Mordants, decolorizers 1.3 Monochrome staining, Differential staining (Gram and Acid fast), Romanowsky's stain, Natural dyes. Theories of staining – physical and chemical. 1.4 Negative staining	15 lectures
USBT-102 Theory	**SCOPE OF BIOTECHNOLOGY.**	2 **Credits** (45 lectures)
Unit-I	**Biomolecules I**	15 lectures.

REFERENCES: USBT 101 & USBT 201

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