VELS UNIVERSITY

VELS INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)

(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)

PALLAVARAM - CHENNAI - INDIA

NAAC ACCREDITED

Department of Bio-Engineering

B.Tech Biotechnology

School of Engineering

Minutes of the Meeting

The meeting of the Board of Studies of B.Tech Biotechnology of the Department of Bio-Engineering, School of Engineering was held on 8th July 2016 at 11.30 A.M. in the Pharmacy conference hall of the School of Pharmaceutical Sciences. The curriculum and syllabus for B.Tech Biotechnology proposed to be introduced by the school of Engineering from the academic year 2015-2016 with the CBCS (Choice Based Credit System) pattern.

The following persons were invited to attend the meeting:

S.No	Name and Address (Members of the Board of Studies)	Designation
1.	**Prof.MukeshDoble** Professor, Department of Biotechnology, Indian Institute of Technology (IITM), Chennai-36. mukesd@iitm.ac.in	**External Expert**
2.	**Dr.N.Bharathi,** **Managing Director,** **Growmore Biotech Ltd,** **#41-B, SIPCOT Phase-II,** **Hosur-635109** India_info@growmorebiotech.com	**External Expert (Industry)**
3.	**Mr.C.Dhanasekaran,** Coordinator, School of Engineering, VelsInstitute of Science, Technology and Advanced Studies (VISTAS), Vels University, Chennai-117	**Internal Member**
4.	**Dr.K.Rajagopal,**	**Internal Member**

	Head, Department of Biotechnology, VELS Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai-117.	
5.	**G.Nithya**	**Student Member**
6.	**Dr.P.Brindha Devi,** Assistant Professor, Dept of Biotechnology, VELS Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai.117.	**Convener**

All the above listed attended the meeting and deliberated on the curriculum and syllabus in detail.

The total credits for the course was 195 as per the regulations for this course.

The entire curriculum structure revised in to three main categories like Core courses, Discipline Specific Elective courses, Generic Elective Courses and Skilled Enhancement Courses. All of these courses the Discipline Specific Elective courses and Generic Elective Courses are selected by students based on the CBCS (Choice Based Credit System) pattern, the choice given to them for selection. The Generic Elective Courses offered to other school students by Department of biotechnology.

The Discipline Specific Elective courses introduced for B.Tech., Biotechnology are,
(From 2nd Year for B.Tech.Biotechnology)

1. Bio Organic chemistry
2. Applied Thermodynamics for Biotechnologists
3. Unit Operations
4. Stoichiometric Fluid Mechanics
5. Heat transfer Operations
6. Mass transfer Operations
7. Downstream processing
8. Creativity, innovation and new product development
9. Chemical Reaction Engineering

LIST OF DISCIPLINE SPECFIC ELECTIVE LABORATORY
(From 2nd Year for B.Tech.Biotechnology)

1. Bioorganic Chemistry Laboratory
2. Downstream Processing Laboratory

Out of these courses the students should select any one or two papers / Semester from Semesters of III-VII.

The Generic Elective Courses are offered for other department students, the courses are,

1. Bioethics and Biosafety
2. Biotechnology Explorations-Applying the Fundamentals
3. Proteins and Enzymes
4. Toxicology
5. Entrepreneurship Development
6. Biotechnology and human welfare
7. Developmental Biology
8. Instrumentation and biotechniques
9. Industrial and Food Microbiology
10. Basics of Forensic science
11. Biotechnology in Health Care

Out of these courses the students should select any one paper / Semester from Semesters of III-VIII.Our students should select one Generic Elective Courses per semester offered by other departments.

Skill Enhancement Courses were included in Semester V and Semester VI. The student must opt one for Semester V and Semester VI.

- NSS Paper I
- Personality Development I
- Personality Development II
- Personality Development III

English papers and Environmental Science and Engineering were included under Ability Enhancement Compulsory Courses for the semester

From secondsemester the students should study Core courses compulsory which include theory papers and practical papers.

SEMESTER II

- Core Paper 1 "Introduction to Biotechnology" have introduced inorder to give basic knowledge in the field of Biotechnology and specialized functions. They will acquire precise knowledge of various aspects of a living cell, its structure, genetics and gene interactions and immune system. Also the students will get knowledge about Biotechnology application in,industry and health care field.
- Core Paper 2"Microbiology" have introduced so that the students will know the importance of Microbiology to emphasize structure and biochemical aspects of various microbes and to help the students to know the application of microbes in industry.
- Core Paper 3 "Microbiology Laboratory" has given, the students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological skills applicable to microbiological research or clinical methods, including accurately reporting observation and analysis.

SEMESTER III

- Core Paper 4 "Biochemistry" has included to develop understanding and provide scientific basics of the life processes at the molecular level and explain the structure, function and inter-relationships of biomolecules and their deviation from normal and their consequences for interpreting and solving clinical problems.
- Core Paper 5 "Cell Biology" has included to provide knowledge on the fundamentals of cell biology and to help students understand the signalling mechanisms.
- Core Paper 6 "Cell Biology Laboratory" has included to demonstrate various techniques to learn the morphology, identification and propagation of cells
- Core Paper 7 "Biochemistry Laboratory" has included to learn and understand the principles behind the qualitative and quantitative estimation of biomolecules (proteins, carbohydrates, lipids, metabolites etc.,) and laboratory analysis of the same in the body fluids.
- Core Paper 8 "Basic Industrial Biotechnology" has included to make the students aware of the overall industrial bioprocess so as to help them to manipulate the process to the requirement of the industrial needs.The course prepares the students for the bulk production of commercially important modern Bioproducts, Industrial Enzymes, Products of plant and animal cell cultures.

SEMESTER IV

- Core Paper 9 "Bioprocess Principles" has included to impart knowledge on design and operation of fermentation processes with all its prerequisites and to endow the students with the basics of microbial kinetics, metabolic stoichiometry and energetics.
- Core Paper 10 "Bioprocess Laboratory" has included to train the students on enzyme characterization, immobilization and medium optimization methods and to train on methods to investigate the growth of microorganisms in different systems under different conditions.
- Core Paper 11 "Enzyme Technology and Biotransformation" has given inorder to learn enzyme reactions and its characteristics along with the production and purification process and to give the student a basic knowledge concerning biotransformation reactions with the usage of enzymes.
- Core Paper 12 " Instrumental Method of Analysis" has included in this semester to attain basic knowledge about handling of instruments and some chromatographic techniques to separate biomolecules.
- Core Paper 13 "Instrumental Method of Analysis Laboratory" has given to have a practical hands on experience on Absoprtion Spectroscopic methods, Chromatographic methods and microscopic techniques.

SEMESTER V

- Core Paper 14 "Protein structure, function and Proteomics" have included to identify the importance of protein biomolecules and to realize the structure-function relationships in proteins.
- Core Paper 15 "Fermentation Technology" has incorporated to give a basic understanding of the types of fermentation process, bioprocess, and the preparation of media, and anaerobic digesters.
- Core Paper 16 "Molecular Biology" has included to facilitate basic fundamental knowledge and explore skills in molecular biology and become aware of the complexity and harmony of the cells.
- Core Paper 17 "Molecular Biology Laboratory" has included to develop experimentally verify the theoretical concepts already studied in theory paper.
- Core Paper 18 "Bioinformatics and Computational Biology" has included to improve the programming skills of the student in biological and computer integrated tool.

- Core Paper 19 "Bioinformatics Laboratory" has included to develop practically verify the theoretical concepts already studied in theory paper.

SEMESTER VI

- Core Paper 20 "Genetic Engineering and Genomics" has incorporated to discuss the gene cloning methods and the tools and techniques involved in gene cloning and genome analysis and genomics.
- Core Paper 21 "Genetic Engineering Laboratory" has incorporated to avail practical knowledge already studied in theory paper.
- Core Paper 22 "Animal Biotechnology" has incorporated to provide the fundamentals of animal cell culture, details of the diseases and therapy.
- Core Paper 23 "Animal Biotechnology laboratory" has included to educate and train the students for lab techniques of animal tissue culture and its manipulation.
- Core Paper 24 "Immunology" has aimed at introducing the science of immunology and detail study various types of immune systems their classification structure and mechanism of immune activation.
- Core Paper 25 "Immunology Laboratory" provides an opportunity to experimentally verify the theoretical concepts already studied. it also helps in understanding the theoretical principles in a more explicit and concentrated manner .
- Core Paper 26 "Proteomics and Genomics" course offers advanced level training on gene expression and gene therapy by covering topics such as genome mapping, proteomic techniques and new targets for drug discovery.

SEMESTER VII

- Core Paper 27 "Molecular Pathogenesis of infectious diseases" course offers to understand about the microbial toxins and modern molecular pathogenesis and to know about the host pathogen interaction and identifying virulence factors
- Core Paper 28 "Medical Microbiology" course offers to understand the microbes involved in pathogenic diseased condition.
- Core Paper 29 "Cancer Biology and Therapeutics" course has introduced to know basic biology of cancer and Impact of antibodies against cancer in the human body leading to more effective treatments

- Core Paper 30 "Plant Biotechnology" course has introduced to give the details of plant cells and its functions.
- Core Paper 31 "Plant Biotechnology Laboratory" course has introduced to facilitate the practical knowledge about the plant tissue culture and manipulation concepts practically.
- Minor Project has been introduced to the students in semester VII to learn the techniques involved in industrial level.

SEMESTER VIII

- Core Paper 32 "Molecular Modelling and Drug Design has incorporated to understand the critical relationship among biomolecular structure, function and force field models and to utilize basic modelling techniques to explore biological phenomena at the molecular level.

All the above change, modification and revision in the syllabus was carried out in order to meet the advancement in the field of Biotechnology to equip the students to compete with other University students for job and research and to face the competitive exams at National level and International Level.

Prof.Mukesh Doble

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