VIGNAN'S
Foundation for Science, Technology & Research
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DEPARTMENT OF BIOTECHNOLOGY

Date: 01.07.2021.

Minutes of Board of Studies (BOS) meeting of B.Tech Biotechnology program held on 01-07-2021 virtually by the Chairman and Head of the Department, Department of Biotechnology, VFSTR, Vadlamudi.

Agenda of the meeting:

1) To discuss and finalize structure of detailed syllabus for B.Tech Biotechnology program applicable from 2021-22 admitted batch.
2) To seek the approval for the induction of computer courses in the curriculum.

Members present:

S.No	Name	Members
1.	Prof. S. Krupanidhi, HOD Department of Biotechnology	Chairman, BOS
2.	Prof. Mukesh Doble, IIT, Madras	Invited member
3.	Prof. Sathyanarayana N Gummadi, IIT, Madras	Invited member
4.	Dr.Vijayalakshmi Venkatesan, Scientist 'G' National Institute of Nutrition, Hyderabad	Invited member
5.	Dr. Shyam Perugu, NIT, Warangal	Invited member
6.	Dr.Narashimhan, Manager, ADVANTA SEEDS, Hyderabad	Invited member
7.	Dr. D. Vijaya Ramu, Professor & Dean Academics	Internal Member
8.	Dr.D.John Babu, Professor,BoA	Internal Member
9.	Dr.T C Venkateswarulu, Professor Dy. HoD	Internal Member
10.	Dr.S.Asha, Professor	Internal Member
11.	Dr. A Ranganadha Reddy, Assoc. Professor	Internal member
12.	Dr. Tarun Pal, Asst Professor	Internal Member

Minutes of the BOS meeting

1. The Chairman welcomed all the members of BOS.
2. The Chairman sent a letter indicating the need for the revision of the curriculum with the induction of supporting courses such as Computer oriented courses.
3. The Chairman sent draft syllabus of B Tech Biotechnology and sought the opinion and suggestions from External experts.
4. The Chairman highlighted broad objectives of the proposed changes in the course structure of B.Tech Biotechnology program.
5. The Chairman also explained in detail the suggestions and comments received from various stakeholders.
6. The members of the BOS thoroughly looked at the proposals of the Department of Biotechnology in the light of suggestions made by experts and recommended a new course structure for B. Tech Biotechnology program.

After the discussion it is resolved to:

1. Proposed courses were approved for all 4 years of B.Tech. Programme in Biotechnology (Appendix I)
2. Proposed courses in computer programming skills were approved with a note not to sacrifice the core courses. The proposed structure and syllabus are applicable from 2021 admitted batch onwards.
3. Stakeholder's feedback is collected, analyzed and given utmost priority while designing the curriculum and their suggestions are implemented
4. The curriculum follows choice-based credit system (CBCS)
5. Major restructuring has taken place in the curriculum by introducing eight computer courses and a few elective courses such as Machine Learning in life sciences, 3D Bioprinting, Industrial Biotechnology, Nanobiotechnology among electives. Downstream processing, Bioanalytical techniques, Chemical Engineering Principles in Biotechnology and Bioreaction Engineering are introduced in the Core as per the advice of Prof. Mukesh Doble, Prof. Gummadi Satyanaryan and Dr. V.Vijayalaksmi. Disease Modeling topic was added in the course Genetics in Biotechnollogy
6. The total percentage of syllabus revision for B.Tech Biotechnology Program is 25%.
7. The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development (Appendix II)

8. In the B.Tech. Biotechnology revised regulation R21, the substantial changes are made in the content of all courses and hence the courses are considered as new courses (Appendix III)

Appendix I

Course Structure

I Year I Semester

Course Title	C
Engineering Mathematics I(B)	5
Engineering Physics I(C)	4
Basics of Electrical and Electronics Engineering	4
Engineering Graphics & Design	3
Basic Engineering Products	3
Introduction to C Programming	4
Physical Fitness, Sports & Games-I	1
Total	**24**

I Year II Semester

Course Title	C
Engineering Mathematics II(B)	5
Organic Chemistry	4
Programming for Problem Solving	4
English Proficiency and Communication Skills	1
Workshop	2
Technical English Communication	3
Constitution of India	1
Bioproducts and Bioentrepreneurship	4
Physical Fitness, Sports & Games-II	1
Total	**25**

II Year I Semester

Course Title	C
Probability and Statistics	4
Biochemistry	4
Cell and Molecular Biology	4

Microbiology and Fermentation Technology	4
Data Structures	3
Life Skills-I	-
Technical Seminar-I	1
Intra-Disciplinary Projects-I	1
Physical Fitness, Sports & Games-III	1
Total	**22**

II Year II Semester

Course Title	C
Genetics	3
Chemical Engineering Principles in Biotechnology	4
Bioanalytical Techniques	3
Management Science	3
Environmental Studies	1
Open Elective - I	**3**
Open Elective - II	**3**
Life Skills -II	**1**
Technical Seminar-II	**1**
Intra-Disciplinary Projects-II	**1**
Total	**23**

III Year I Semester

Course Title	C
Bioprocess Engineering	4
Bioreaction Engineering	4
Open Elective - III	**3**
Open Elective - IV	**3**
Soft Skill Laboratory -1	**1**
Employability Skills-1	**-**
Inter-Departmental Projects-I	**2**
Modular course	**1**
Dept. elective-I	**3**
Total	**21**

III Year II Semester

Course Title	C
Down Steam Processing	4
Genetic Engineering	4
Professional Communications Laboratory	1
Human Values, Professional Ethics & Gender Equity	2
Open Elective - V	**2**
Open Elective - VI	**1**
Employability Skills-II	**1**
Inter-Departmental Projects-II	**2**
Dept. Elective-II	**3**
Open Elective (via NPTEL/Swayam)	**3**
Total	**23**

IV Year I Semester

Course Title	C
Bioinformatics	4
Genomics, Proteomics and Metabolomics	3
Immunology and Immunoinformatics	4
Societal-Centric and Industry Related Projects	**3**
Dept. Elective-III	**3**
Dept. Elective-IV	**3**
Total	**20**

IV Year II Semester

Course Title	C
Internship / Project work	**12**
Total	**12**

The courses that are highlighted denote implementation of 'Choice Based Credit System (CBCS)'

Pool of Departmental Electives

Course Title	C
Methods and Practice of Animal and Human Cell Culture	3
Handling of Animals for Experiments	3
Tissue and Organ Replacement Technology	3
Assisted Reproductive Technology	3
Immunotechnology	3
Vaccinology	3
Phage Display	3
Plant Breeding	3
Plant Tissue Culture and Transgenics	3
Biodiversity and Ecology	3
Plant Metabolism	3

Phytopharma	3
Medicinal Plants and Ethnobotany	3
Conservation of Biodiversity	3
DNA Barcoding for Conservation Strategy	3
Interdisciplinary Topics	3
Data Science	3
Bioenergetics	3
Dynamic Energy Budgets	3
Molecular Phylogenetics	3
3D Bioprinting	3
Machine learning in Life Sciences	3
Bioethics and Intellectual Property Rights	3
Algorithms in Bioinformatics	3
Industrial Biotechnology	3
Nanobiotechnology	3
Python Programming for Biotechnologists	3
Molecular Interactions	3
Biological Database	3
Drug Design	3
Metabolic Pathways	3
Systems Biology	3
Neural Networks	3

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APPENDIX - II

List of courses that enable employability or entrepreneurship or skill development in the R-21 B.Tech – Biotechnology

S.No	Semester (Year)	Course Name	Employability/ Entrepreneurship/ Skill development
1.	Semester I (First Year)	Engineering Mathematics I(B)	Skill development
2.	Semester I (First Year)	Engineering Physics I (C)	Skill development
3.	Semester I (First Year)	Basics of Electrical & Electronics Engineering	Skill development
4.	Semester I (First Year)	Engineering Graphics & Design	Skill development
5.	Semester I (First Year)	Introduction to C programming	Skill development
6.	Semester I (First Year)	Basics of Computer and Internet	Skill development
7.	Semester II (First Year)	Engineering Mathematics II(B)	Skill development
8.	Semester II (First Year)	Organic Chemistry	Skill development
9.	Semester II (First Year)	Programming for Problem Solving	Employability
10.	Semester II (First Year)	English Proficiency and Communication Skills	Skill development
11.	Semester II (First Year)	Technical English Communication	Skill development
12.	Semester II (First Year)	Constitution of India	Skill development
13.	Semester II (First Year)	Workshop	Skill development
14.	Semester I (First Year)	Bio-products & Bio-entrepreneurship	Entrepreneurship

15.	Semester I (Second Year)	Biochemistry	Skill development
16.	Semester I (Second Year)	Cell and Molecular Biology	Skill development
17.	Semester I (Second Year)	Microbiology and Fermentation Technology	Entrepreneurship
18.	Semester I (Second Year)	Data Structures	Employability
19.	Semester II (Second Year)	Genetics	Skill development
20.	Semester II (Second Year)	Chemical Engineering Principles in Biotechnology	Employability
21.	Semester II (Second Year)	Bio-Analytical Techniques	Skill development
22.	Semester II (Second Year)	Management Science	Employability
23.	Semester II (Second Year)	Environmental Studies	
24.	Semester I (Third Year)	Bioprocess Engineering	Entrepreneurship
25.	Semester I (Third Year)	Bioreaction Engineering	Employability
26.	Semester I (Third Year)	Soft Skills laboratory	Employability
27.	Semester I (Third Year)	Employability skills-1	Employability
28.	Semester I (ThirdYear)	Modular course	Employability
29.	Semester II (Third Year)	Downstream processing	Entrepreneurship
30.	Semester II (Third Year)	Genetic Engineering	Employability
31.	Semester II (Third Year)	Professional communication laboratory	Employability
32.	Semester II (Third Year)	Human values, Professional ethics and Gender Equality	Employability
33.	Semester II (Third Year)	Employability skills - II	Employability
34.	Semester I (Fourth Year)	Bioinformatics	Skill development
35.	Semester I (Fourth Year)	Genomics, Proteomics and Metabolomics	Skill development
36.	Semester I (Fourth Year)	Immunology and Immunoinformatics	Entrepreneurship
37.	Third year & Fourth year	Methods and Practice of Animal and Human Cell Culture	Employability
38.	Third year & Fourth year	Handling of Animals for Experiments	Employability
39.	Third year & Fourth year	Tissue and Organ Replacement Technology	Employability
40.	Third year &	Assisted Reproductive	Employability

	Fourth year	Technology	
41.	Third year & Fourth year	Immunotechnology	Entrepreneurship
42.	Third year & Fourth year	Vaccinology	Entrepreneurship
43.	Third year & Fourth year	Phage Display	Entrepreneurship
44.	Third year & Fourth year	Plant Breeding	Employability
45.	Third year & Fourth year	Plant Tissue Culture and Transgenics	Employability
46.	Third year & Fourth year	Biodiversity and Ecology	Employability
47.	Third year & Fourth year	Plant Metabolism	Employability
48.	Third year & Fourth year	Phytopharma	Employability
49.	Third year & Fourth year	Medicinal Plants and Ethnobotany	Entrepreneurship
50.	Third year & Fourth year	Conservation of Biodiversity	Employability
51.	Third year & Fourth year	DNA Barcoding for Conservation Strategy	Employability
52.	Third year & Fourth year	Interdisciplinary Topics	Employability
53.	Third year & Fourth year	Data Science	Skill development
54.	Third year & Fourth year	Bioenergetics	Skill development
55.	Third year & Fourth year	Dynamic Energy Budgets	Skill development
56.	Third year & Fourth year	Molecular Phylogenetics	Skill development
57.	Third year & Fourth year	3D Bioprinting	Employability

58.	Third year & Fourth year	Industrial Biotechnology	Employability
59.	Third year & Fourth year	Nanobiotechnology	Employability
60.	Third year & Fourth year	Python Programming for Biotechnologists	Employability
61.	Third year & Fourth year	Machine Learning in life science	Employability
62.	Third year & Fourth year	Bioethics and intellectual Property rights	Employability
63.	Third year & Fourth year	Molecular Interactions	Employability
64.	Third year & Fourth year	Biological Database	Employability
65.	Third year & Fourth year	Drug Design	Entrepreneurship
66.	Third year & Fourth year	Metabolic Pathways	Employability
67.	Third year & Fourth year	Systems Biology	Employability
68.	Third year & Fourth year	Neural Networks	Employability

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APPENDIX - III

List of new courses in the R-21
B.Tech – Biotechnology Curriculum

S.No	Semester (Year)	Course Name
1.	Semester I (First Year)	Introduction to C Programming
2.	Semester I (Second Year)	Microbiology and Fermentation Technology
3.	Semester I (Second Year)	Data Structures
4.	Semester II (Second Year)	Chemical Engineering Principles in Biotechnology
5.	Semester I (Third Year)	Bioreaction Engineering
6.	Professional Elective	3D Bioprinting
7.	Professional Elective	Machine learning in Life Sciences
8.	Professional Elective	Bioethics and Intellectual Property Rights
9.	Professional Elective	Industrial Biotechnology
10.	Professional Elective	Nanobiotechnology
11.	Professional Elective	Molecular Interactions
12.	Professional Elective	Biological Database
13.	Professional Elective	Drug Design
14.	Professional Elective	Metabolic Pathways
15.	Professional Elective	Systems Biology
16.	Professional Elective	Neural Networks

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