VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be University)
-Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF BIOTECHNOLOGY

Date: 05.04.2019.

Minutes of Board of Studies (BOS) meeting of B.Tech Biotechnology program held on 05-04-2019 at the office 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 2019-20 admitted batch.

Members present:

S.No	Name	Members	Signature
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 Pvt Ltd, Hyderabad	Invited member	
7.	Dr. D. Vijaya Ramu, Professor & Dean Academics	Internal Member	
8.	Dr.D.John Babu, Associate Professor	Internal Member	
9.	Dr.Abhinav Parasher, Assistant Professor	Internal Member	
10.	Dr.M.Indira, Assistant Professor	Internal Member	

Minutes of the BOS meeting

1. The chairman welcomed all the members of BOS.
2. The chairman highlighted broad objectives of the proposed changes in the course structure of B.Tech Biotechnology program.
3. The chairman also explained in detail the suggestions and comments received from various stakeholders.
4. 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. Propose and approve course structure for all 4 years of B.Tech. Programme in Biotechnology (Appendix I)
2. Propose and approve detailed syllabus for the 4 year of B.Tech. Programme in Biotechnology with effect from the academic year 2019-20. The proposed structure and syllabus are applicable for 2019 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
5. Major restructuring has taken place in the curriculum which is oriented towards project-based learning with the inclusion of Intradisciplinary, Inter-departmental, Societal centric and industry related projects
6. Major restructuring has taken place in the curriculum by introducing new elective streams such as Immuno-technology and Tissue Engineering, Conservation of Biodiversity and Crop improvement and Bioinformatics which includes many advanced courses like Phase Display, Vaccinology, Tissue Repair and Regeneration, Assisted Reproductive Technology, Data Science, PERL etc.
7. The total percentage of syllabus revision for B.Tech Biotechnology Program is 64%.
8. The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development (Appendix II)
9. In the B.Tech. Biotechnology revised regulation R19, 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	L	T	P	C
Engineering Mathematics I(B)	3	1	2	5
Engineering Physics I(C)	3	0	2	4
Basics of Electrical and Electronics Engineering	3	0	2	4
Engineering Graphics & Design	2	0	2	3
Basic Engineering Products	2	0	2	3
Physical Fitness, Sports & Games-I	0	0	3	1
Total	**13**	**1**	**13**	**20**

I Year II Semester

Course Title	L	T	P	C
Engineering Mathematics II(B)	3	1	2	5
Organic Chemistry	3	0	2	4
Programming for Problem Solving	3	0	2	4
English Proficiency and Communication Skills	0	0	2	1
Workshop	1	0	2	2
Technical English Communication	2	0	2	3
Constitution of India	1	0	0	1
Bioproducts and Bioentrepreneurship	3	1	0	4
Physical Fitness, Sports & Games-II	0	0	3	1
Total	**15**	**2**	**17**	**25**

II Year I Semester

Course Title	L	T	P	C
Probability and Statistics	3	1	0	4
Biochemistry	3	0	2	4
Cell and Molecular Biology	3	0	2	4
Microbiology	3	0	2	4
Unit Operations	3	0	0	3
Management Science	3	0	0	3
Life Skills-I	0	0	2	-
Technical Seminar-I	0	0	4	1
Intra-Disciplinary Projects-I	0	0	3	1
Physical Fitness, Sports & Games-III	0	0	2	1
Total	**18**	**1**	**17**	**25**

II Year II Semester

Course Title	L	T	P	C
Genetics	3	0	2	4
Biothermodynamics	3	0	0	3
Bioanalytical Techniques	3	0	2	4
Microbial Technology	3	0	0	3
Environmental Studies	1	0	0	1
Life Skills -II	0	0	2	1
Technical Seminar-II	0	0	2	1
Intra-Disciplinary Projects-II	0	0	2	1
Open Elective-I	3	0	0	3
Total	**16**	**0**	**10**	**21**

III Year I Semester

Course Title	L	T	P	C
Bioprocess Engineering	3	0	2	4
Enzyme Technology	3	0	2	4
Heat and Mass Transfer for Biotechnologists	3	0	2	4
Soft Skills Laboratory	1	0	0	1
Employability Skills-I	0	0	2	-
Inter-Departmental Projects-I	0	0	4	2
Modular course	0	0	0	1
Any one from 3 elective streams	3	0	0	3
Open Elective-II	3	0	0	3
Total	**16**	**0**	**12**	**22**

III Year II Semester

Course Title	L	T	P	C
Biochemical Reaction Engineering	3	0	2	4
Genetic Engineering	3	0	2	4
Downstream Processing	3	1	0	4
Professional Communications Laboratory	0	0	2	1
Human Values, Professional Ethics & Gender Equity	2	0	0	2
Employability Skills-II	0	0	2	1
Inter-Departmental Projects-II	0	0	4	2
Any one from 3 elective streams	3	0	0	3
Open Elective-III	3	0	0	3
Total	**17**	**1**	**12**	**24**

IV Year I Semester

Course Title	L	T	P	C
Bioinformatics	3	0	2	4
Genomics, Proteomics and Metabolomics	3	0	2	4
Immunology and Immunoinformatics	4	0	2	4
Societal-Centric and Industry Related Projects	0	0	6	3
Any one from 3 elective streams	3	0	0	3
Any one from 3 elective streams	3	0	0	3
Total	**16**	**0**	**12**	**21**

IV Year II Semester

Course Title	L	T	P	C
Internship / Project work	-	-	24	12
Total	**-**	**-**	**24**	**12**

Department Electives

STREAM - 1: IMMOUNOTECHNOLOGY AND TISSUE ENGINEERING

Course Title	L	T	P	C
Methods and Practice of Animal and Human Cell Culture	3	-	-	3
Handling of Animals for Experiments	3	-	-	3
Tissue and Organ Replacement Technology	3	-	-	3
Assisted Reproductive Technology	3	-	-	3
Immunotechnology	3	-	-	3
Vaccinology	3	-	-	3
Phage Display	3	-	-	3

STREAM - 2: CONSERVATION OF BIODIVERSITY AND CROP IMPROVEMENT

Course Title	L	T	P	C
Plant Breeding	3	-	-	3
Plant Tissue Culture and Transgenics	3	-	-	3
Biodiversity and Ecology	3	-	-	3
Plant Metabolism	3	-	-	3
Phytopharma	3	-	-	3
Medicinal Plants and Ethnobotany	3	-	-	3
Conservation of Biodiversity	3	-	-	3
DNA Barcoding for Conservation Strategy	3	-	-	3
Interdisciplinary Topics	3	-	-	3

STREAM - 3: BIOINFORMATICS

Course Title	L	T	P	C
Data Science	3	-	-	3
Bioenergetics	3	-	-	3
Dynamic Energy Budgets	3	-	-	3
Perl	3	-	-	3
Metabolic Engineering and Metabolomics	3	-	-	3
Python Programming for Biotechnologists	2	-	2	3
Algorithms in Bioinformatics	3	-	-	3

Open Electives

Course Title	L	T	P	C
Elements of Biotechnology	3	-	-	3
Community Medicine and Public Health	3	-	-	3
Biodiversity Economics, Trade and Commerce	3	-	-	3
Bioplastics and Biocomposites Engineering	3	-	-	3

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APPENDIX - II

List of courses that enable employability or entrepreneurship or skill development in the R-19 B.Tech – Biotechnology

S.No	Semester (Year)	Core/Elective	Course Name	Employability/ Entrepreneurship/ Skill development
1.	Semester I (First Year)	Basic Engineering	Bio-products & Bio-enterprenurship	Skill development
2.	Semester I (Second Year)	Professional Core	Biochemistry	Skill development
3.	Semester I (Second Year)	Professional Core	Cell and Molecular Biology	Skill development
4.	Semester I (Second Year)	Professional Core	Microbiology	Skill development
5.	Semester I (Second Year)	Professional Core	Unit Operations	Skill development
6.	Semester II (Second Year)	Professional Core	Genetics	Skill development
7.	Semester II (Second Year)	Professional Core	Bio-Thermodynamics	Skill development
8.	Semester II (Second Year)	Professional Core	Bio-Analytical Techniques	Skill development
9.	Semester II (Second Year)	Professional Core	Microbial Technology	Skill development
10.	Semester I (Third Year)	Professional Core	Bioprocess Engineering	Skill development
11.	Semester I (Third Year)	Professional Core	Enzyme Technology	Skill development
12.	Semester I (Third Year)	Professional Core	Heat and Mass Transfer	Skill development
13.	Semester II (Third Year)	Professional Core	Biochemical Reaction Engineering	Skill development
14.	Semester II (Third Year)	Professional Core	Genetic Engineering	Skill development
15.	Semester II (Third Year)	Professional core	Downstream processing	Skill development
16.	Semester I (Fourth Year)	Professional Core	Bioinformatics	Skill development

S.No	Semester (Year)	Core/Elective	Course Name	Employability/ Entrepreneurship/ Skill development
17.	Semester I (Fourth Year)	Professional Core	Genomics, Proteomics & Metabolomics	Skill development
18.	Semester I (Fourth Year)	Professional Core	Immunology and Immunoinformatics	Skill development
19.		Professional Elective	Methods and Practice of Animal and Human Cell Culture	Employability
20.		Professional Elective	Handling of Animals for Experiments	Employability
21.		Professional Elective	Tissue Repair and Regeneration	Employability
22.		Professional Elective	Assisted Reproductive Technology	Employability
23.		Professional Elective	Immunotechnology	Employability
24.		Professional Elective	Vaccinology	Employability
25.		Professional Elective	Phage Display	Employability
26.		Professional Elective	Medicinal Plants and Ethnobotany	Employability
27.		Professional Elective	Biodiversity and Ecology	Employability
28.		Professional Elective	Conservation of Biodiversity	Employability
29.		Professional Elective	DNA Barcoding for Conservation Strategy	Employability
30.		Professional Elective	Plant Breeding	Employability
31.		Professional Elective	Plant Tissue Culture and Transgenics	Employability
32.		Professional Elective	Plant Metabolism	Employability
33.		Professional Elective	Python Programming	Employability
34.		Professional Elective	Bio-PERL	Employability
35.		Professional Elective	Data Science	Employability
36.		Professional Elective	Algorithms in Bioinformatics	Employability
37.		Professional Elective	Bioenergetics	Employability
38.		Professional Elective	Dynamic Energy Budgets	Employability
39.		Professional Elective	Metabolic Engineering and Metabolomics	Employability
40.		Open Elective	Elements of Biotechnology	Skill development

S.No	Semester (Year)	Core/Elective	Course Name	Employability/ Entrepreneurship/ Skill development
41.		Open Elective	Community Medicine and Public Health	Skill development
42.		Open Elective	Biodiversity Economics, Trade and Commerce	Skill development
43.		Open Elective	Bioplastics and Biocomposites Engineering	Skill development

Chairman BoS

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APPENDIX - III

List of new courses in the R-19
B.Tech – Biotechnology Curriculum

S.No	Semester (Year)	Course Name
1.	Semester II (First Year)	Bioproducts and Bioenterprenurship
2.	Semester I (Second Year)	Biochemistry
3.	Semester I (Second Year)	Cell and Molecular Biology
4.	Semester I (Second Year)	Microbiology
5.	Semester I (Second Year)	Unit Operations
6.	Semester II (Second Year)	Genetics
7.	Semester II (Second Year)	Bio-Thermodynamics
8.	Semester II (Second Year)	Bio-Analytical Techniques
9.	Semester II (Second Year)	Microbial Technology
10.	Semester I (Third Year)	Bioprocess Engineering
11.	Semester I (Third Year)	Enzyme Technology
12.	Semester I (Third Year)	Heat and Mass Transfer
13.	Semester II (Third Year)	Biochemical Reaction Engineering
14.	Semester II (Third Year)	Genetic Engineering
15.	Semester II (Third Year)	Downstream processing
16.	Semester I (Fourth Year)	Bioinformatics
17.	Semester I (Fourth Year)	Genomics, Proteomics & Metabolomics
18.	Semester I (Fourth Year)	Immunology and Immunoinformatics
19.	Elective	Methods and Practice of Animal and Human Cell Culture
20.	Elective	Handling of Animals for Experiments

S.No	Semester (Year)	Course Name
21.	Elective	Tissue Repair and Regeneration
22.	Elective	Assisted Reproductive Technology
23.	Elective	Immunotechnology
24.	Elective	Vaccinology
25.	Elective	Phage Display
26.	Elective	Medicinal Plants and Ethnobotany
27.	Elective	Biodiversity and Ecology
28.	Elective	Conservation of Biodiversity
29.	Elective	DNA Barcoding for Conservation Strategy
30.	Elective	Plant Breeding
31.	Elective	Plant Tissue Culture and Transgenics
32.	Elective	Plant Metabolism
33.	Elective	Python Programming
34.	Elective	Bio-PERL
35.	Elective	Data Science
36.	Elective	Algorithms in Bioinformatics
37.	Elective	Bioenergetics
38.	Elective	Dynamic Energy Budgets
39.	Elective	Metabolic Engineering and Metabolomics
40.	Elective	Elements of Biotechnology
41.	Elective	Community Medicine and Public Health
42.	Elective	Biodiversity Economics, Trade and Commerce
43.	Elective	Bioplastics and Biocomposites Engineering

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