

**VIGNAN'S**

Foundation for Science, Technology & Research

(Deemed to be University)

-Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF BIOTECHNOLOGY**Action Taken Report on B. Tech Biotechnology Program R 16 Feedback****Implemented in R19 introduced in the AY 2019 - 20*****Action taken based on the suggestions from Students:***

1. The Course Contents of Biotechnology Curriculum are in tune with the Program Outcomes
2. The Biotechnology Course Contents are designed to enrich laboratory Skills and Core competencies.
3. The Courses placed in the Biotechnology curriculum serve the needs of both advanced and slow learners.
4. Contact Hour Distribution among the various Course Components (LTP) is Satisfiable.
5. The Electives offered will enrich the passion to learn new technologies in emerging areas.
6. The Curriculum provides an opportunity towards Self learning to realize the expectations.
7. The Composition of Basic Sciences, Engineering, Humanities and Management Courses in the curriculum is a right mix and satisfiable.
8. No. of Laboratory sessions Integrated with Theory Courses in Biotechnology have been sufficient to improve the technical skills.
9. Integration of Minor Project with Theory Courses offered in Biotechnology have enhanced the technical competency and leadership skills in the management of biotech related firms.

Analysis of Overall Feedback given by the Students on R 16

Parameters	Strongly Agree	Agree	Moderate	Disagree	Strongly Disagree	Avg. Rating	Grade
Q1	81.4	15.3	2.2	0	0.4	4.752	Excellent
Q2	24.6	69.5	3.7	0	1.5	4.136	Excellent
Q3	69.7	20.7	7.8	1.1	0	4.569	Excellent
Q4	15.5	71.9	10.4	0.7	0.7	3.984	Very Good
Q5	69.4	22.1	5.6	1.5	0.7	4.559	Excellent
Q6	11	76.7	10.5	0.7	0.4	3.951	Very Good
Q7	15.9	76.7	5.9	0.4	0.4	4.052	Excellent
Q8	66.4	25.8	6.7	0	0.4	4.557	Excellent
Q9	69.8	22.1	6.3	0.7	0.4	4.581	Excellent

Itemized responses given to the Suggestions of Students

Suggestion: Include production processes of commercial Bioproducts in Industrial Biotechnology course.

Action Taken: Production processes of different commercial Bioproducts were included in the syllabus of Industrial Biotechnology course.

Suggestion: Minor projects to be carried out in a semester are more.

Action Taken: In place of three minor projects per semester a comprehensive single minor project per semester as Intra, Inter and societal centric projects were introduced.

Suggestion: Unit operations related to solids handling are missing in Process Engineering Principles course.

Action Taken: One complete unit on solids handling namely Size reduction and Separations was added to Process Engineering Principles course and it was renamed as Unit Operations.

Suggestion: Advanced topics like PERL and XML are needed to be included in Bioinformatics course.

Action Taken: Concepts related to new developments in the field of Bioinformatics such as PERL, XML, Dot plot, Pubmed, Human genome database, Molecular clocks, cDNA library construction and Primer design were added to Bioinformatics course.

Suggestion: Cell Biology and Molecular Biology can be clubbed together.

Action Taken: Cell Biology and Molecular Biology courses were merged and named as Cell and Molecular Biology.

Suggestion: Include advanced courses in elective streams.

Action Taken: Professional core elective streams were totally revised by introducing many advanced courses such as Tissue and Organ replacement Technology, Assisted Reproduction Technology, Vaccinology, Phase Display etc.,

Suggestion: More emphasis has to be given on informatics courses in Biotechnology curriculum.

Action Taken: A new stream of professional core electives namely Bioinformatics was introduced by including emerging courses in the field of Bioinformatics such as Python Programming for Biotechnologists, Algorithms in Bioinformatics, PERL and Data Science.

Suggestion: Online courses have to be given some weightage in the form of credits.

Action Taken: Offered Credits for online Courses (NPTEL, Swayam, Coursera, FDX) to inculcate self-learning skills over the students.

Action taken based on the suggestions from Alumni:

1. The Curriculum laid a good foundation in understanding the basic engineering concepts in Biotechnology.
2. The Course Contents of Biotechnology Curriculum are in tune with the Program Outcomes.
3. The Biotechnology Curriculum encompasses all the required Job Oriented Skills.

4. Professional and Open Electives of Curriculum serve the technical advancements needed in the Biotech, Biologics and Pharma industry.
5. The Tools and Technologies learnt during laboratory sessions will enrich the quality control and quality assurance in Biotechnology industry.

Analysis of Overall Feedback given by the Alumni on R 16

Parameters	Strongly Agree	Agree	Moderate	Disagree	Strongly Disagree	Avg. Rating	Grade
Q1	32.2	58.9	5.6	3.3	0	4.2	Excellent
Q2	45.6	24.4	25.6	4.4	0	4.112	Excellent
Q3	21.1	36.7	22.2	14.4	5.6	3.533	Very Good
Q4	28.9	38.9	20	8.9	3.3	3.812	Very Good
Q5	23.3	35.6	10	25.6	5.6	3.457	Good
Q6	35.6	36.7	18.9	4.4	4.4	3.947	Very Good
Q7	46.7	37.8	8.9	3.3	3.3	4.213	Excellent

Itemized responses given to the suggestions of Alumni

Suggestion: In Biochemical Reaction Engineering course include concepts related to design of fermentation processes.

Action Taken: Modeling of growth kinetics and design of fermentation processes were added to Biochemical Reaction Engineering course.

Suggestion: Add design concepts to Bioprocess Engineering course.

Action Taken: Design of fermentation media, Modes of fermentation process, Kinetics of microbial growth, and Mixing time calculation were added to Bioprocess Engineering course.

Suggestion: Introduce more advanced courses in Professional Electives.

Action Taken: Professional core elective streams were totally revised by introducing many advanced courses such as Tissue and Organ replacement Technology, Assisted Reproduction Technology, Vaccinology, Phase Display etc.,

Suggestion: Assign projects to students on real time problems.

Action Taken: Societal centric projects were introduced in R19 curriculum to give real time exposure to students.

Suggestion: Promote self-learning ability of students by encouraging online courses.

Action Taken: Offered Credits for online Courses (NPTEL, Swayam, Coursera, FDX) to inculcate self-learning capability in students.

Suggestion: Include GATE syllabus in curriculum which helpful to the students in cracking GATE exam

Action Taken: GATE syllabus was considered in preparing the syllabus of R19 curriculum.

Action taken based on the suggestions from Faculty:

1. The Course Contents of Biotechnology Curriculum are in tune with the Program Outcomes.
2. The Course Contents along with the laboratory skills will enhance biomedical and Core competencies.
3. The allocation of Credits to the respective Courses is satisfiable.
4. The Contact Hour Distribution among the various Course Components (LTP) is Satisfiable
5. Electives will enable the passion to learn new technologies in emerging areas of Biotechnology.
6. The Curriculum provides an opportunity towards Self learning to realize the expectations.
7. The Composition of Basic Sciences, Engineering, Humanities and Management Courses in the curriculum is satisfiable?
8. The number of theoretical courses amalgamated with laboratory sessions is sufficient to improve the Genetic Engineering and Bioprocess technical skills of students.
9. The integration of Minor Project with Theory Courses will improve the technical competency and leadership skills among the students.

Analysis of Overall Feedback given by the Faculty on R 16

Parameters	Strongly Agree	Agree	Moderate	Disagree	Strongly Disagree	Avg. Rating	Grade
Q1	50	41	9	0	0	4.41	Excellent
Q2	57.7	38.5	0	3.8	0	4.501	Excellent
Q3	51.3	48.7	0	0	0	4.513	Excellent
Q4	57.7	29.5	12.8	0	0	4.449	Excellent
Q5	60.3	39.7	0	0	0	4.603	Excellent
Q6	52.6	39.7	3.8	3.8	0	4.408	Excellent
Q7	64.1	30.8	5.1	0	0	4.59	Excellent
Q8	57.7	35.9	6.4	0	0	4.513	Excellent
Q9	65.4	28.2	3.8	2.6	0	4.564	Excellent

Itemized responses given to the suggestions of Faculty

Suggestion: For Biotechnology students it is essential to understand the concepts related to production of commercially important products.

Action Taken: Emphasized on production of different commercially important products in the subject Industrial Biotechnology

Suggestion: It is better to add the topic biochemicals in the subject Bioproducts and Bioentrepreneurship.

Action Taken: The topic biochemicals was added in the subject Bioproducts and Bioentrepreneurship to give more insights at basic level.

Suggestion: it is more appropriate to include the concept of Biosafety levels in the subject Microbiology in order to acquaint the knowledge to protect from biohazards handled in laboratory as well as industries.

Action Taken: The concept of Biosafety levels was added in the unit 5 of Microbiology subject to acquaint the knowledge to protect from biohazards handled in laboratory as well as industries.

Suggestion: It is better to remove the subject Fermentation products as elective subject because it is the one repeats in the basic subjects like Industrial Biotechnology and Bioproducts and Bioentrepreneurship.

Action Taken: The subject Fermentation products as elective subject was removed as it is the one repeats in the course title Bioproducts and Bio-entrepreneurship.

Suggestion: It is useful to include the topics namely; Role of a bioprocess engineer, Design of fermentation media, Modes of fermentation process, Kinetics of microbial growth, Mixing time calculation in the subject Bioprocess engineering.

Action Taken: The topics role of a bioprocess engineer, Design of fermentation media, Modes of fermentation process, Kinetics of microbial growth, mixing time calculation were added in the subject Bioprocess engineering to provide more insights on bioprocess and the mixing time calculation experiment is very much essential in bioprocess industry.

Suggestion: It is better to introduce the concepts of Metabolomics in the subject Proteomics and Genomics.

Action Taken: The concept metabolomics was added in the subject Proteomics and genomics as it is one of the emerging areas in the field of Biotechnology.

Suggestion: It is better to add the topic evaluation of antibody titre serum concept in the laboratory experiments of the subject Immunology and Immunoinformatics.

Action Taken: The topic evaluation of antibody titre serum concept was included in the laboratory experiments of the subject Immunology and Immunoinformatics.

Suggestion: It is essential to introduce the topics PERL, XML, Dot plots, PubMed, Human genome database, Molecular clocks, cDNA library construction and Primer design in the subject Bioinformatics.

Action Taken: The topics PERL, XML, Dot plots, PubMed, Human genome database, Molecular clocks, cDNA library construction and Primer design were incorporated in the course Bioinformatics.

Suggestion: It is useful to replace the multiple reactions with modelling of growth kinetics and design of fermentation processes in the course title Biochemical Reaction Engineering.

Action Taken: The topic multiple reactions were replaced with modelling of growth kinetics and design of fermentation processes in the subject Biochemical reaction engineering.

Suggestion: Better to add radiation heat transfer in the 2nd unit and remove the topics Stefan's estimation of diffusivities for gases and liquids from Heat and Mass transfer.

Action Taken: the topic Stefan's estimation of diffusivities for gases and liquids was removed and radiation heat transfer was added in the 2nd unit of Heat and Mass transfer subject.

Suggestion: It is advised to rename the subject Transgenic plants as Plant tissue culture and transgenics.

Action Taken: The subject Transgenic plants was renamed as Plant tissue culture and transgenics.

Action taken based on the suggestions from Employers:

1. The Course Contents of Biotechnology Curriculum are in tune with the Program Outcomes.
2. The relevance of the Course Contents is applicable with the Biotech, Biologics and Pharma Industry.
3. The Professional Electives and Open Electives offered to students are in-line with the technology advancements in the biotech related firms.
4. Applicability of the tools and technologies described in the curriculum will be enough to practice in Industry.
5. Laboratory skills and theoretical concepts acquired by the students through the course contents will enable them to be placed in MNC.

Analysis of Overall Feedback given by the Employers on R 16

Parameters	Strongly Agree	Agree	Moderate	Disagree	Strongly Disagree	Avg. Rating	Grade
Q1	42.4	51.5	0	6.1	0	4.302	Excellent
Q2	39.4	30.3	30.3	0	0	4.091	Excellent
Q3	48.5	27.3	21.2	3	0	4.213	Excellent
Q4	45.5	51.5	3	0	0	4.425	Excellent
Q5	63.6	21.2	3	12.1	0	4.36	Excellent

Itemized responses given to the suggestions of Employers

Suggestion: It is required to introduce advanced professional electives for solving health and food issues occurring due to exponential growth of population.

Action Taken: Three major advanced professional electives such as Immunotechnology and Tissue Engineering, Conservation of Biodiversity and Crop improvement and Bioinformatics were included for development of vaccines and repair of tissue or whole organ, enhance of crop productivity and to decode various genomes and identify link between specific disease and gene sequence that cause them receptively.

Suggestion: Better to include more courses for solving local societal problems.

Action Taken: Introduced societal-eccentric and industry related projects in final year first semester and interdepartmental projects in third year for solving local problems and enhance project based learning.

Suggestion: Introduce courses which make familiar with students on advanced research areas in the field of Biotechnology.

Action Taken: Technical seminars offered in second year help in understanding various advanced topics and gain knowledge by doing preliminary research.

Suggestion: It is better to provide option for students learning their choice of interested courses through online e-learning digital platforms.

Action Taken: Provided options and allocated credits for learning courses through e-learning platforms like NPTEL, SWAYAM etc., to gain knowledge about the courses of student's interest.

Suggestion: Include more programming languages and softwares to perform simulation of bioprocesses.

Action Taken: Included OOPs programming languages as open electives to enhance programming skills which are helpful for simulation of bioprocesses.

Action taken based on the suggestions from Parents:

1. The theoretical courses and practical sessions offered in our Biotechnology curriculum are satisfiable.
2. The overall assessment of technical knowledge in Biotechnology disciplines acquired by your ward who is pursuing his/her program in our institution is satisfiable.
3. The Academic and Emotional Progression of your ward are satisfying as per your expectations.
4. Competency of your ward in Biotechnology is on par with the students from other Universities/Institutes.
5. Course Contents of our Biotechnology Curriculum are in tune with the Industry demand.

Analysis of Overall Feedback given by the Parents on R 16

Parameters	Strongly Agree	Agree	Moderate	Disagree	Strongly Disagree	Avg. Rating	Grade
Q1	100	0	0	0	0	5	Excellent
Q2	100	0	0	0	0	5	Excellent
Q3	0.4	99.6	0	0	0	4.004	Excellent
Q4	90.9	9.1	0	0	0	4.909	Excellent
Q5	100	0	0	0	0	5	Excellent

Itemized responses given to the suggestions of Parents

Suggestion: Give priority to enhance communication skills and presentation skills to get placement in multinational companies.

Action Taken: In view of the importance of communication skills in the current scenario, courses such as Technical English Communication, English Proficiency and Communication Skills and Professional Communication lab were continued in curriculum.

Suggestion: Take steps to give more practical orientation to students to understand the concept clearly.

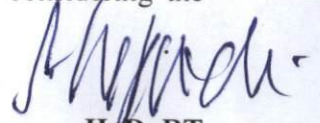
Action Taken: Majority of the courses were integrated with laboratories to give more practical orientation to students.

Suggestion: Project oriented learning will give an opportunity to students to improve technical skills.

Action Taken: Specific activities related to major theory courses were pre-defined to facilitate students to carry out minor projects in that courses.

Suggestion: Courses must improve the chances of higher education to students.

Action Taken: The syllabus contents of all core courses were developed by considering the syllabus of all national level competitive exams.


HOD, BT