INSTITUTE OF CHEMICAL TECHNOLOGY

University under Section 3 of the UGC act 1956
Elite Status & Centre of Excellence - Govt. of Maharashtra, Mumbai
NAAC Grade A++ (CGPA 3.77)

Department of Food Engineering & Technology

Supported by UGC CAS II, DST-FIST and DBT

11 March 2022

WELCOMES

THE CHAIRMAN & MEMBERS OF NATIONAL BOARD OF ACCREDITATION (NBA) TEAM

Genesis of the department

1943
- B. Sc. (Tech) in Chemistry of Foods and Drugs

1945
- Masters and Ph.D. (Tech.) programs

1949
- Full fledged B.Sc (Tech) degree course in Food Technology; Masters and Ph. D. (Tech.) programs

1963
- Masters program in Fermentation Technology was initiated
- Renamed as 'Food & Fermentation Technology Department'

2000
- All graduate program aligned as 12+4 pattern
- Name changed to 'Food Engineering & Technology Department'

2009
- M.Tech. (Food Biotechnology) programs

2018
- Platinum Jubilee of the department

Courses offered by the Department

Sr. No.	Degree	Comments	Intake
1	B.Tech. (Food Engineering & Technology)	• AICTE Approval in 1993 • AICTE approval for (12 + 4) Pattern in 2008 • NBA accredited for 6 years till June 2022	**16**
2	M. Tech. (Food Engineering & Technology)	• AICTE Approval in 2008 • NBA accredited for 6 years till June 2026	18
3	**M. Tech. (Food Biotechnology)**	• **AICTE Approval in 2008** • **NBA accredited in 2016 till June 2021**	**10**
4	Ph. D. (Tech.) (Food Engg. & Tech) Ph. D (Tech) (Food Biotechnology) Ph. D (Tech) (Bioprocess Technology) Ph. D (Biotechnology) Ph. D (Biochemistry) Ph. D (Food Science) Ph. D (Microbiology)	• 10 UGC-SAP fellowships from 2007 to 2014. • 15 UGC-SAP fellowships (Food 10 + 5 BPT) from 2009 to 2014. • AICTE NDF	15

Interdisciplinary Courses

Sr. No.	Degree	Comments	No. of seats
1	M. Tech. (Bioprocess Technology)	DBT Supported Interdisciplinary course	30
2	M. Tech. (Perfumery & Flavors)	The Perfumery & Flavors Association of India (PAFAI) supported Interdisciplinary course with Chemical Engineering, Oils, Foods, Pharmaceuticals & Specialty Chemicals Department	5
3	M. Tech. (Green Technology)	Interdisciplinary with Chemistry, CE, FETD, Pharma	30

Major Research Areas

Carbohydrate Chemistry and Technology

- Plant gums, Micro-encapsulation, Low GI, High-fiber, Nutraceuticals

Fermentation Technology and Biotechnology

- Fermentative production and downstream processing of biomolecules (enzymes, Therapeutics, Bioplymers, Nutraceuticals, Pigments and Others)

Indian Traditional Foods and Commodity Technologies

- Process and product development for Indian traditional Foods
- Utilizing indigenous agricultural resources (Fruits and vegetables, plantation crops, cereals and legumes) for product development

Food Biotechnology

- Fermented products
- Utilization of wastes from food processing industries
- Probiotics and prebiotics
- Downstream processing of bioactives

Key Achievements

Manpower Generated in last 3 Years

Graduated Students

- Bachelor Degree : 48
- Masters Degree : 78
- Doctorates : 8

Research Outcome

- Research Publications : ~138
- Technology Transfer : 1
- Patents Granted : 1
- Patents Applied : 4

Connection across the Globe

Collaboration within India

- BARC
- TIFR
- IIT Bombay
- NCL, Pune
- ACTREC, Mumbai
- IIT Kharagpur
- ICRISAT Hyderabad
- CDRI Lucknow

International Collaboration

- Penn State University, USA
- Washington State University, USA
- Rutgers University, USA
- Queens University, Canada
- University of Saskatchewan, Canada
- University of Reading, UK
- Aalto University, Finland
- Paul-Elrich Institute, Germany
- Hohenheim University

Distinguished Alumni from Department

Late Prof. D. V. Rege

2007

Prof. P. R. Kulkarni

2011

Dr. Deepa Bhajekar

2012

Mr. L. R. Chadha

2012

Prof. C. J. K. Henry

2014

Mr. Rakesh Bamzai

2017

Prof. Smita S. Lele

2021

Prof. Rekha Singhal

Eminent Adjunct Faculty of the Department

Prof. Mukund Karwe

Dean of International Programs,

Dept of Food Science, Rutgers University, USA
Editor, Journal of Food Engineering

Prof. R.C. Anantheswaran

Professor of Food Engineering & Director for Education by Non-Traditional Delivery

Penn State University, USA

Editor, International Food Research Journal

Prof. K. Niranjan

Professor of Food Bioprocessing

University of Reading, UK

Editor, Journal of Food Engineering

Prof. Shyam S. Sablani

Associate Department Chair

Biological Systems Engineering,

Washington State University, USA

Editor, Journal of Food Science

Prof. Kalidas Shetty

Associate Vice President for International Partnerships
Plant Metabolism & Food Security

North Dakota State University, USA

Editor Journal Food Science and Technology

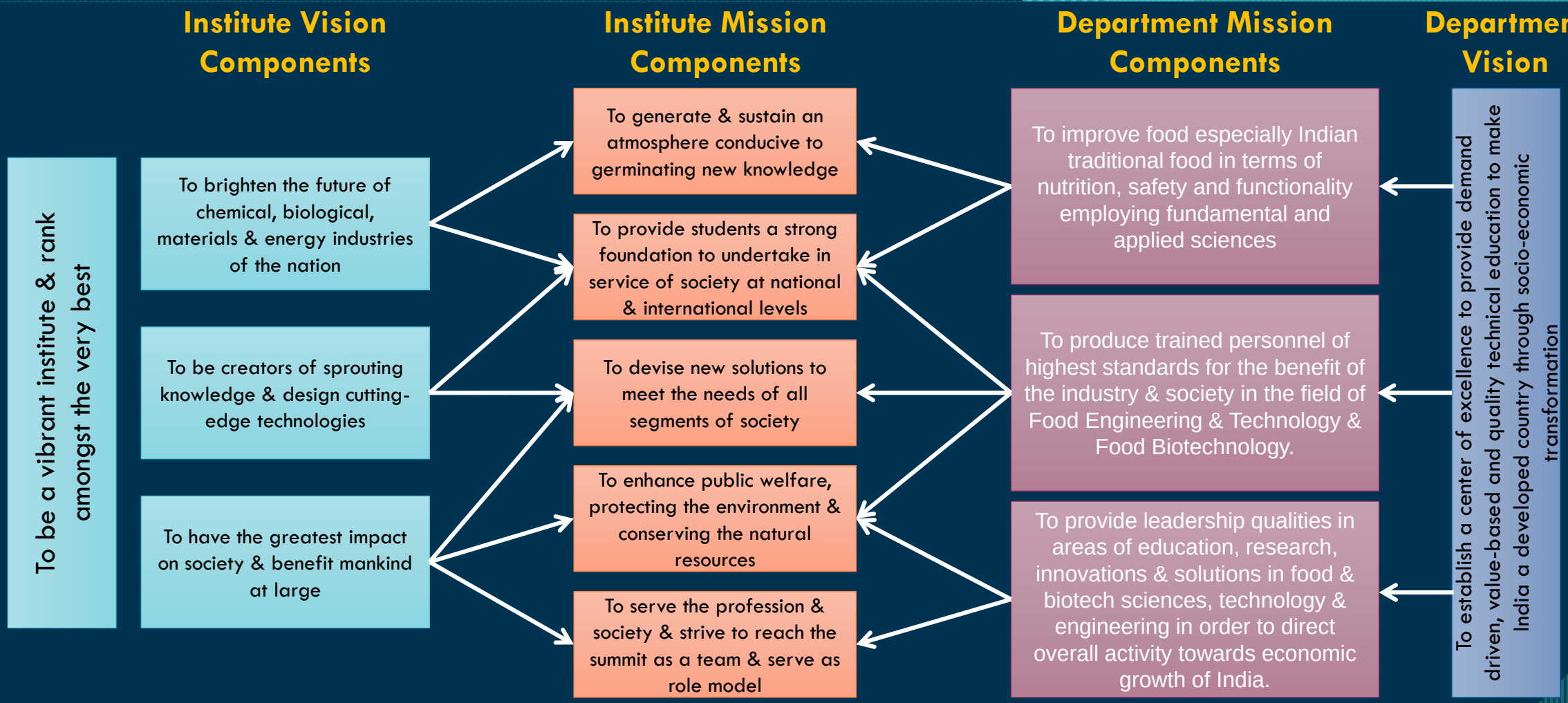
Vision

Establishing a center of excellence to provide demand driven, value-based and quality technical education to make India a developed country through socio-economic transformation

Mission

1. To improve food especially Indian traditional food in terms of nutrition, safety and functionality employing fundamental and applied sciences.
2. To produce trained personnel of highest standards for the benefit of the industry & society in the field of Food Engineering & Technology & Food Biotechnology.
3. To provide leadership qualities in areas of education, research, innovations & solutions in food & biotech sciences, technology & engineering in order to direct overall activity towards economic growth of India.

Consistency in Vision & Mission



Program Educational Objectives (PEOs)

PEO1 To impart education in a new area of specialization *viz*., Food Biotechnology to enable students to work in areas such as food fermentations, applications of enzymes in food processing, food product development, nutraceuticals, nutritional and functional foods, nutrigenomics etc. and to help them formulate solutions to meet the needs of the consumers and the industry.

PEO2 The interdisciplinary nature of the course prompts intake of students from mixed disciplines creating the need to bring students from varying academic backgrounds to a common platform of understanding through courses structured to meet this need.

PEO3 To provide a strong base of knowledge to students in this interdisciplinary field to transform them into good professionals who can function with confidence in their chosen workplace and contribute to the growth of the organization employing them.

PEO4 To motivate and enable students to opt for higher levels of learning viz. doctoral programs by research in this interdisciplinary field with the view of developing highly skilled professionals to work in Industry and academia.

Consistency of the PEOs with the Mission

	PEO1	PEO2	PEO3	PEO4
M1: To improve food especially Indian traditional food in terms of nutrition, safety and functionality employing fundamental and applied sciences.	**2**	**2**	**3**	2
M2: To produce trained personnel of highest standards for the benefit of the industry and society in the field of Food Engineering & Technology and Food Biotechnology.	**3**	**2**	**3**	3
M3: To provide leadership qualities in areas of education, research, innovations and solutions in food and biotech sciences, technology and engineering in order to direct overall activity towards economic growth of India.	**3**	**3**	**3**	3

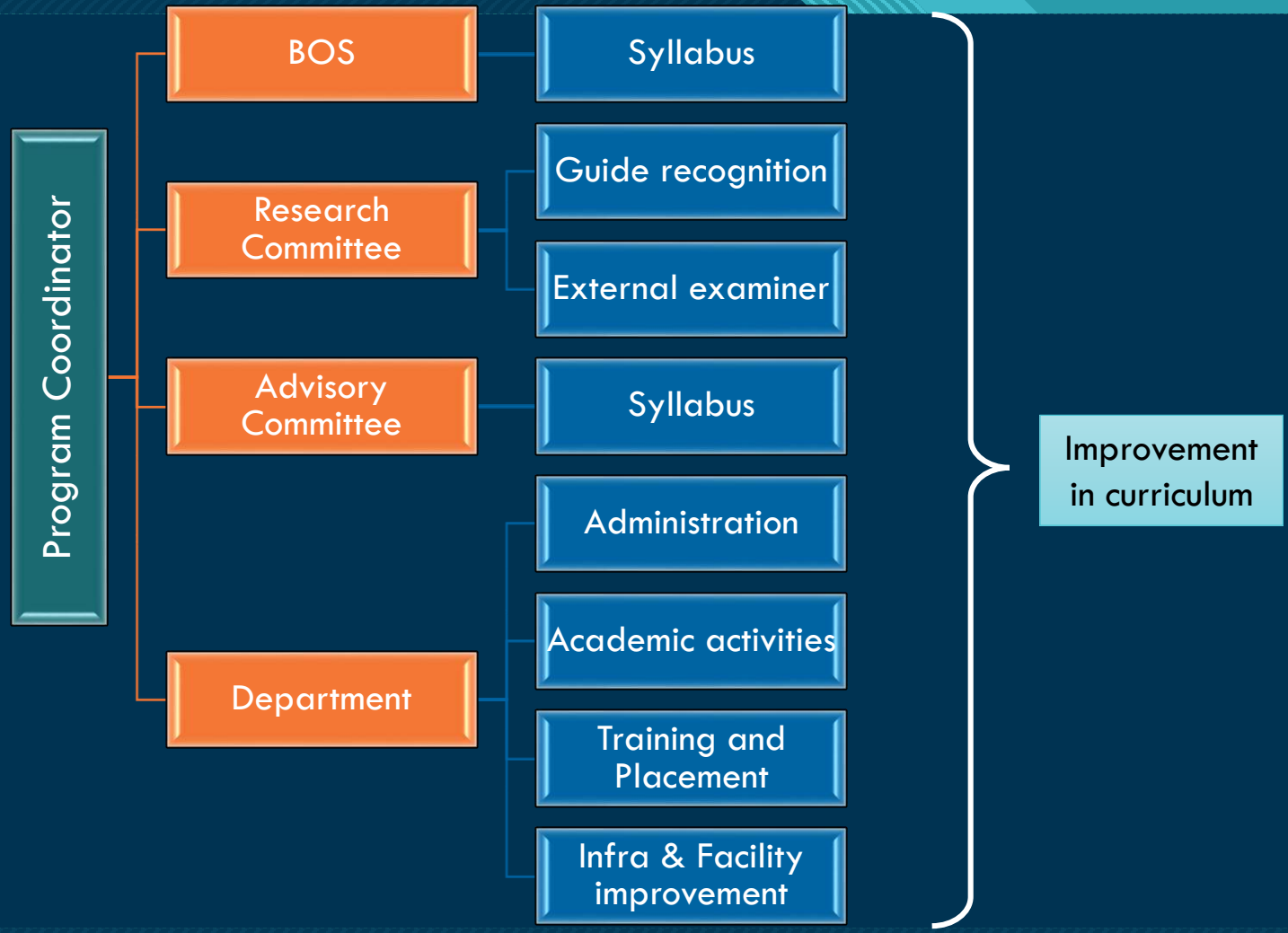
3, 2, 1 refers strong, medium and weak correlations, respectively

Program Outcomes and their Consistency

POs	Program Outcome Statement	PEO1	PEO2	PEO3	PEO4
PO1	An ability to independently carry out research or investigation and development work to solve practical problems	2	3	2	3
PO2	An ability to write and present a substantial technical report or document	2	3	2	3
PO3	An ability to demonstrate a degree of mastery over the area of food biotechnology	3	2	3	3
PO4	An ability to use and evaluate modern techniques or tools applied in food biotechnology for product and process development and for analysis	3	3	2	2
PO5	An ability to analyze problems and offer solutions related to food science, nutrition, food safety and packaging	3	2	3	2

3, 2, 1 refers strong, medium and weak correlations, respectively

Committees


Program Coordinator
BOS
Syllabus
Research Committee
Guide recognition
External examiner
Advisory Committee
Syllabus
Department
Administration
Academic activities
Training and Placement
Infra & Facility improvement
Improvement in curriculum

Committees

RRC Committee

- Prof. Laxmi Ananthanarayan (Chairperson)
- Prof. P. D. Devarajan (Dean RI)
- Prof. P.R. Gogate (Member)
- Dr. A. Anil (Member)
- Dr. C. S. Mathpati (Member)
- Dr. P. D. Jain (Member)
- Dr. J. S. Gokhale (Member)
- Dr. Vishal Warke (Member)
- Dr. Prasanna Venkatraman (Member)
- Dr. Ganesh Ramchandran (Member)
- Dr. Tara Menon (Member)
- Dr. Samir Kulkarni (Member)
- Dr. Anil Gupta (Member)
- Dr. G. Prakash (Member Secretary)

BOS

- Prof. P. D. Devarajan (Chairperson)
- Prof. Laxmi Ananthanarayan (MTech FBT Program Coordinator)
- Dr. P. D. Jain (MTech PBT Program Coordinator)
- Dr. R. D. Jain (MTech BPT Program Coordinator)
- Dr. S. S. Sathye (Member)
- Dr. A. Anil (Member)
- Dr. C. S. Mathpati (Member)
- Dr. J. S. Gokhale (Member)
- Dr. S. Reshamwala (Member)
- Dr. Smita Limaye (Member)
- Dr. Tanmay Gharat (Member)
- Dr. Parag Saudagar (Member)
- Dr. Gaesh Iyer (Member)
- Dr. Samir Kulkarni (Member)
- Dr. Tara Menon (Member)
- Dr. Hitesh Pawar (Member)

Advisory Committee

- Vice Chancellor (Chairperson)
- DBT Representative (DBT Nominee)
- Prof. S.S. Barve (External Academic Expert)
- Prof. S. Shailajan (External Academic Expert)
- Dr. Parag Saudagar (Alumni and Industry Person)
- Mr. Ankur Chauhan (Skill expert)
- All core and associated faculty members of the program
- Prof. Laxmi Ananthanarayan (Member Secretary)

Criteria 1: Program Curriculum and Teaching - Learning Processes

Designing the Curriculum

Step I: Defining program specific criteria

- Science & Tech Courses
- Engineering Courses
- Core Electives
- Interdisciplinary Electives

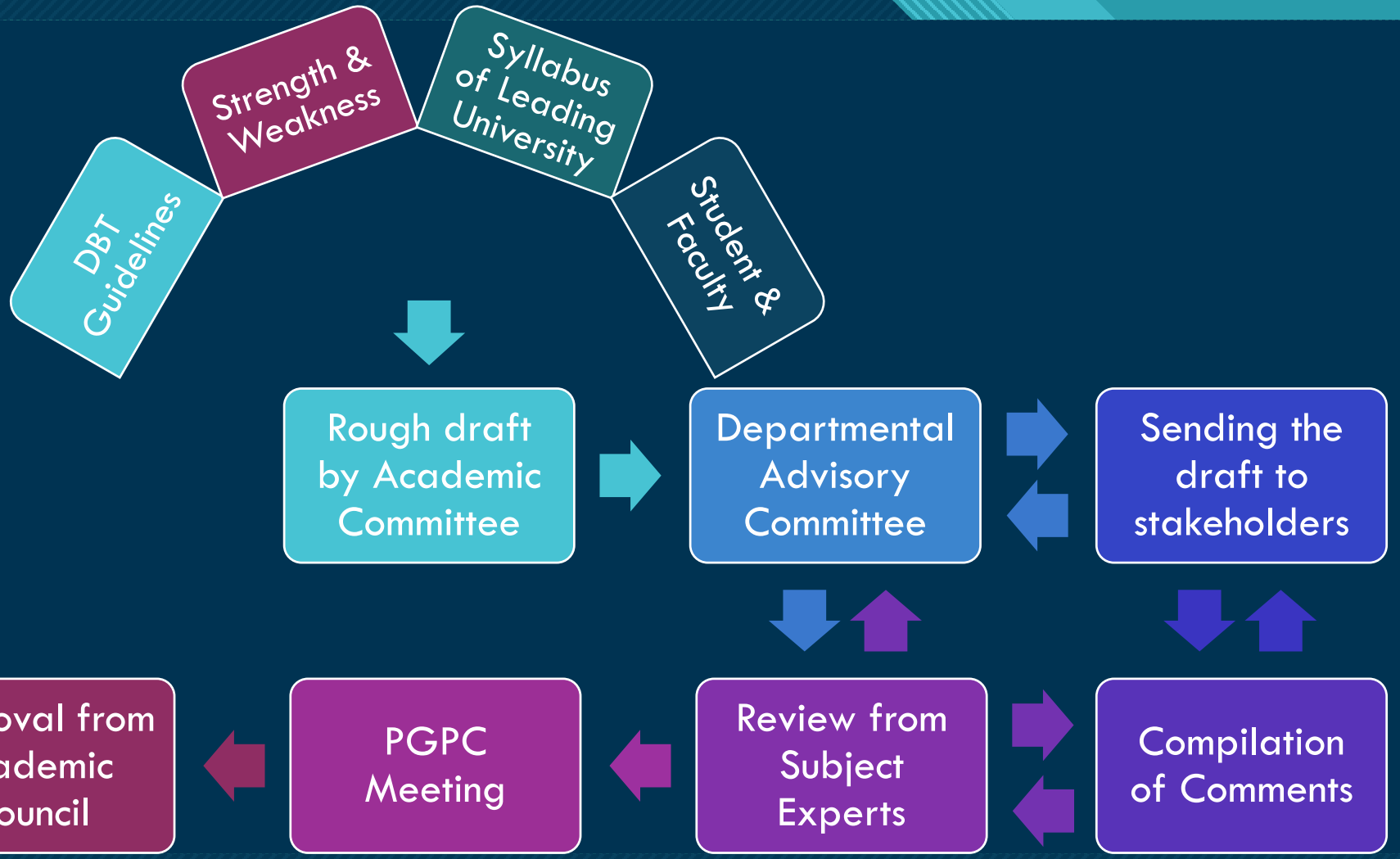
Step II: How to place in curriculum?

- What is lacking?
- What is the required knowledge & skill level?
- Designing the course

Step III: Modifying the syllabus

- Distribution of the courses
- Defining COs
- Mapping COs-POs

Revising the Curriculum



Strength of Program

1. Strong exposure to industry-based problems
2. Good research facility
3. Excellent teaching staff
4. High quality research
5. Industrial visits
6. Exposure to Guest Lecture
7. Endowment Lectures
8. Webinars

Stakeholders Input
a) Alumni b) External examiners c) Visiting faculty d) Subject experts from eminent institutes e) Industry experts f) Graduated students

Suggestions by previous NBA committee

No	Concern	Action taken
1	Engineering components in the syllabi need to be included	• FDT2053: Fundamentals of Food Process Engineering subject is made core subject in Semester I • FDT2058: Bioprocess Engineering and Technology subject is added as core subject in Semester II • FDP2067: Food Analysis and Processing Lab is restructured with respect to addition of engineering lab component • FDT2056: Introduction of Food Science and Technology subject is restructured with respect to technology component.
2	Frequent revision of the syllabi is needed.	• Syllabus revision is done in 2017 • In 2018, DBT has given guidelines for DBT supported courses which were taken into consideration in the syllabi revision • Addition of approved elective subject FDT2077: Enzymes in Food and Feed Industry in 2021-22 • Research Methodology is proposed as a compulsory audit course from academic year 2021-22
3	Food Biotechnology related industries participation is not seen/ evident.	• Food Biotechnology related industries were included in the In-plant training. • Industrial visits in the Food Biotechnology related industries are included. • Industry experts from Food Biotech industries were invited for interaction with students.
4	Evidence related Entrepreneurship initiatives	• In Student/ Industry/Alumni interaction lecture series, entrepreneurship related lectures • Starting of S. K. Mokashi Preincubation Centre (ICT-NICE)
5	In the course curriculum development, SWOT analysis data/ information is missing.	• SWOC analysis data is now included.

Suggestion by previous NBA committee

No	Concern	Action taken
6	No separate faculty is allocated for M. Tech. Food Biotechnology. Same faculty also teach M. Tech. Food Engg & Tech which is not justified.	Additionally three faculties with Biotechnology background are now teaching and guiding the M. Tech. FBT students.
7	Food Engineering/ Biochemical Engineering lab are missing. Since student intake in the program comes from diverse field and food engineering subjects are taught and therefore creation of Food Engineering lab is must.	FDP2067: Food Analysis and Processing Lab is restructured with respect to addition of engineering component.
8	Based on student feedback, evidence on corrective action not seen.	• Student feedback is taken into consideration for IPT and addition of subject FDT2077:Enzymes in Food and Feed Industry • Saturday Lecture Series is implemented for Student-Industry-Alumni interaction • Online In-plant training, online industrial visits and training programs are conducted
9	Continuing education in the area of food biotechnology is not seen.	• Ph. D. (Tech) in Food Biotechnology program initiated • 21 students have enrolled in past 10 years & 5 of these students are our M. Tech. FBT students continuing for higher studies • About 15 students from 10 batches of M. Tech. FBT have pursued Ph. D. in India/abroad

Curriculum Structure - M. Tech. FBT

Semester I

Component	Course code	Course title	Total number of contact hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total h/wk	
Core I	FDT 2056	Introduction to Food Science and Technology	2	1	N.A.	3	3
Core II	FDT 2008	Comprehensive techniques in Food Analysis	2	1	N.A.	3	3
Core III	FDT 2053	Fundamentals of Food Process Engineering	2	1	N.A.	3	3
Program Elective I	FDT 2023	Food Packaging Science and Technology	2	1	N.A.	3	3
Open Elective I	FDT 2021	Food Standards and Safety Regulations	2	1	N.A.	3	3
Practical	FDP 2067	Food Analysis and Processing Lab	N.A.	N.A.	6	6	3
Seminar	FDP 2066	Seminar and Critical Review of Research Paper	N.A.	N.A.	6	6	3
Project	FDP 2068	Research I	N.A.	N.A.	12	12	6
						Total credits	27

 # Seminars, project works may be considered as practical. 'N.A.' stands for not applicable.

Curriculum Structure - M. Tech. FBT

Semester II

Component	Course code	Course title	Total number of contact hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total h/wk	
Core I	FDT 2057	Fundamentals of Food Biotechnology, Genetics, and Cell Culture Technology	2	1	N.A.	3	3
Core II	FDT 2055	Biotechnology of Fermented Foods	2	1	N.A.	3	3
Core III	FDT 2058	Bioprocess Engineering and Technology	2	1	N.A.	3	3
Program Elective I	FDT 2013	Elective I: Basics of Human Nutrition	2	1	N.A.	3	3
Open Elective I	FDT 2077	Elective II: Enzymes in Food and Feed Industry	2	1	N.A.	3	3
Practical	FDP 2052	Food Biotechnology Laboratory	N.A.	N.A.	6	6	3
Project	FDP 2018	Research II	N.A.	N.A.	18	18	9
						Total credits	27

Curriculum Structure - M. Tech. FBT

Semester III

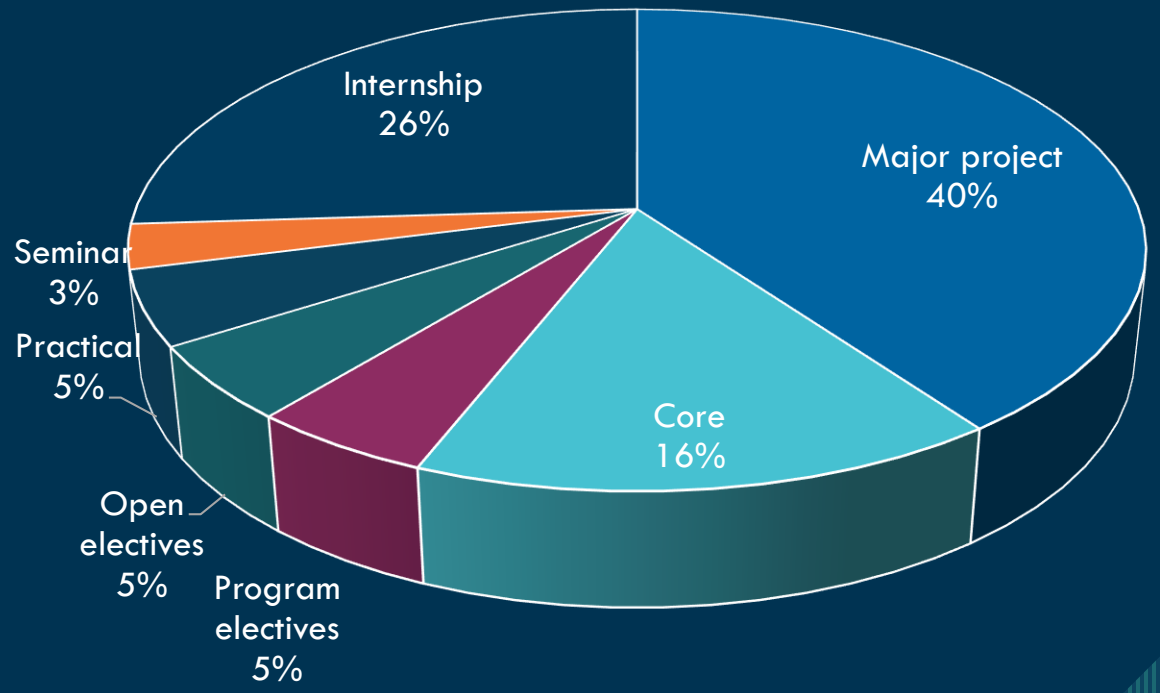
Component	Course code	Course title	Total number of contact hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total h/wk	
Training	FDP 2070	IPT/ Semester III Research	N.A.	N.A.	40 h (15 weeks)	40 h (15 weeks)	30

Semester IV

Component	Course code	Course title	Total number of contact hours				Credits
			Lecture (L)	Tutorial (T)	Practical (P)	Total h/wk	
Training	FDP 2071	Research, Thesis and Open Defense	N.A.	N.A.	40 h (15 weeks)	40 h (15 weeks)	30

Contribution in Curriculum Structure

Course component	Total number of credits	Curriculum content (% of total number of credits of the program)
Program core (×6)	18	15.8%
Program electives (×2)	6	5.3%
Open electives (×2)	6	5.3%
Practical (×2)	6	5.3%
Seminar	3	2.6%
Internship	30	26.3%
Major project	45	39.5%
Total	114	



Benchmark & Quality of Curriculum

Course Component	Curriculum content (% of total number of credits of the program)			
Institute	ICT Mumbai	SRM Kharagpur	SRU Gujrat	UFU Russia
Stream	Food Biotechnology	Food & Nutrition Biotechnology	Food Biotechnology	Food Biotechnology
Program core	15.8	20	32	53
Electives	10.6	16	28	14
Practical	5.3	10	22	-
Seminar	2.6	2	4	-
Internship	26.3	-	4.5	12
Major Project	39.5	52	18	20
Total Credit	114	92	130	93

Assessment is based on improvement in terms of ranks/score in JNU CEEB/ GAT-B entrance examination

JNU CEEB Entrance Exam	2021-22	2020-21	2019-20	2018-19	2017-18
Highest score	175	171	53	56	52
Minimum Score	60	109	40	37.75	35.25

Evaluation Process

	In-Semester evaluation		End-Sem Exam	Components of continuous mode
	Continuous mode	Mid Sem Exam		
Theory	20%	30%	50%	Quizzes, class tests (open or closed book), home assignments, group assignments, *viva-voce* assignments, discussions
Practical	50%	-	50%	Attendance, *viva -voce*, journal, assignments, project, experiments, tests
Seminar/ Research work			100%	Continuous evaluation not applicable, End semester evaluation will be based on written report evaluation & presentation in front of the external examiner within the Department

Industry supported laboratories

- ✓ Prof. DV Rege Centre for Advanced Food Technology is sponsored by HIMEDIA Lab, India (58 lakhs)
- ✓ Food Analysis lab and PTC Research lab has been renovated by Goodwill Industries Ltd., India (13 lakhs)
- ✓ Fermentation lab and Conference room is sponsored by Fine Organics Ltd., India (53 lakhs)
- ✓ Food Processing lab is sponsored by Dr. Shrikhande (10000 USD)
- ✓ Research lab 283 is sponsored by Morde Foods (48 lakhs)





Visiting Faculty from Industry

No	Name of faculty	Subject	Hour/wk
1	Mrs. Subha Nishtala	FDT2021: Food Standards, Safety & Regulations	2
2	Mrs. Rohini Sharma	FDT2021: Food Standards, Safety & Regulations	1
3	Dr. Jyoti Baliga	FDT2023: Food Packaging Science & Technology	1
4	Dr. Jayant Bandekar	FDT 2002: Food Safety & Toxicology	1
5	Dr. Veena Yardi	FDT 2075: Basics of Human Nutrition	1
6	Dr. Lambert Rodrigues	FDT2055: Biotechnology of Fermented Foods	1
7	Dr. Shantanu Samant	FDT2005: Carbohydrate Chemistry & Technology	2
8	Dr. Shruti Kakodkar	FDT2057: Fundamentals of Food Biotech, Genetics and Cell Culture Technology	2
9	Dr. Sagar Gokhale	FDT2053: Fundamentals of Food Process Engineering	1
10	Dr. Ninad Pandit	FDT2058: Bioprocess Engineering and Technology	1
11	Dr. N. Ramsubramanian	FDT2056: Introduction to Food Science and Technology	1
12	Dr. Padma Iyer	FDT2077: Enzymes in Food and Feed Industry	2

Saturday Lecture Series
(Student-Industry/Alumni Interaction)

No	Name of speaker	Topic	Date
1	Dr. N. Ramasubramanian	Job opportunities and challenges in food and allied industries	03 April 2021
2	Dr. Sagar Gokhale	New Product Development: An Industry Perspective	10 April 2021
3	Dr. Malathy Venkatesan	Are you and the industry ready for one another?	17 April 2021
4	Dr. Rupesh Tupe	Entrepreneurial skills for start-up and food marketing in digital space	24 April 2021
5	Mr. Sahil Desai	How to be corporate ready: A perspective	08 May 2021
6	Dr. Parag Saudagar	Journey of A Biotech Startup	15 May 2021
7	Dr. Ganesh Ramchandran	Increase your employability quotient- a blueprint for entering and succeeding in corporate life after M. Tech	22 May 2021
8	Dr. Preeti Shrinivas,	"Campus to Corporate	29 May 2021
9	Mr. Bishal Prasher	Taking control of the flow - Learnings from 2 years of M. Tech. FBT and beyond	05 June 2021
10	Dr. Pavitra Krishna Kumar	ICT and Beyond: My experiences as a food scientist	12 June 2021

Industrial Training

AY 2016-17

Sr.	Roll No.	Name	Industry
1	16FBT201	Alisha Sukhija	Mondelez, Mumbai
2	16FBT202	Harsha Bharwani	Nestle, Goa
3	16FBT203	Mukesh Patel	OmniActive Health Technologies Ltd. Pune
4	16FBT204	Nitin Sangle	Mondelez, Mumbai
5	16FBT205	Prabhat Chauhan	ITC, Bengaluru
6	16FBT206	Sana Shaikh	Tata Chemicals, Pune
7	16FBT207	Lubna Shaik	Marico Industries, Mumbai
8	16FBT208	Shraddha Srinivasan	ITC, Bengaluru
9	16FBT209	Shubham Gaikwad	Nestle, Goa
10	16FBT210	Sumita Kumari	VKL Spices, Mumbai

AY 2017-18

Sr.	Roll No.	Name	Industry
1	17FBT201	Abdur Rehman Khan	Himedia, Mumbai
2	17FBT203	Bishal Prasher	Mondelez, Mumbai
3	17FBT204	Deep Dave	VKL, Mumbai
4	17FBT205	Lathika G. V.	AAK Kamani, Mumbai
5	17FBT206	Shreyasi Phatak	Inovantus Technologies, Mumbai
6	17FBT207	Shriya Das	Inovantus Technologies, Mumbai
7	17FBT208	Sneha Kamble	Diageo, Bengaluru
8	17FBT209	Stuti Agarwal	Diageo, Bengaluru
9	17FBT210	Sudharshini B.	Diageo, Bengaluru

Industrial Training

AY 2018-19

Sr.	Roll No.	Name	Industry
1	18FBT201	Aayushi Pal	Merino India, New Delhi
2	18FBT202	Chirag Anandi	Equinox Labs, Navi Mumbai
3	18FBT203	Logesh V. N.	Equinox Labs, Navi Mumbai
4	18FBT204	Mohammad Shahrukh	Tata Chemicals, Pune
5	18FBT205	Mona Kokwar	Equinox Labs, Navi Mumbai
6	18FBT206	Shruthy Seshadrinathan	Novozymes, Bengaluru
7	18FBT207	Srutee Rout	Himedia, Mumbai
8	18FBT208	Varad Bende	ITC, Bengaluru
9	18FBT209	Zumismita Kalita	Tata Chemicals, Pune

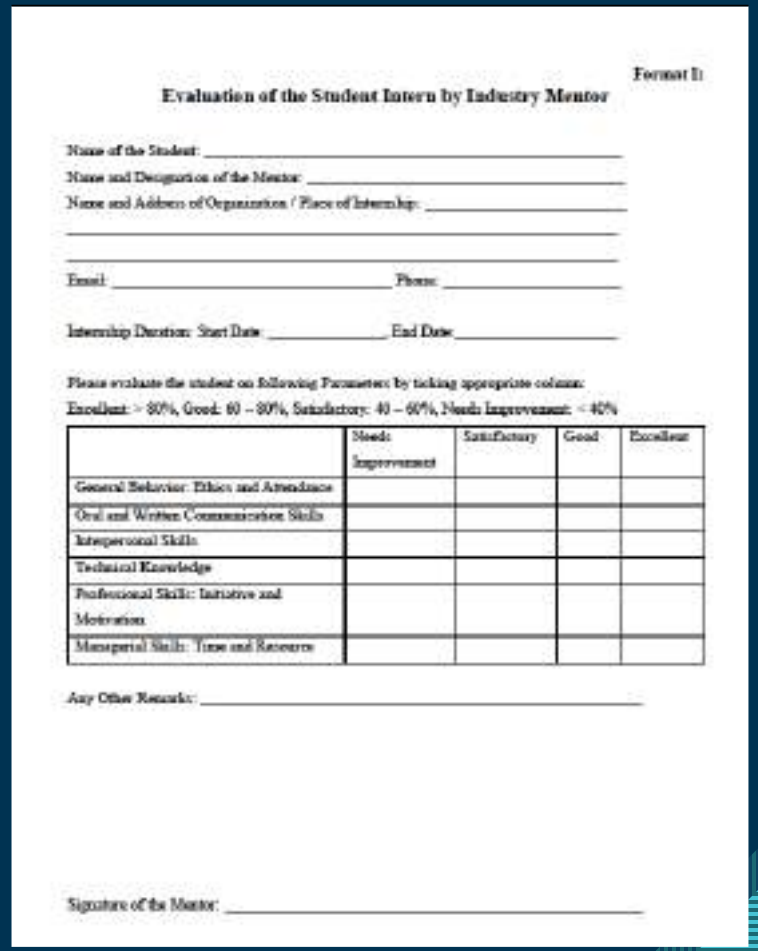
AY 2020-21

Sr.	Roll No.	Name	Industry
1	20FBT201	Aadya Sathe	S.K. Biobiz Pvt. Ltd., Nasik,
2	20FBT202	Abhinaya Tu	S.K. Biobiz Pvt. Ltd., Nasik,
3	20FBT203	Akalya Sendrayakannan	V. R. Foodtech Pvt. Ltd., Mumbai
4	20FBT207	Jaya Chendrayan	Ojman Foodbio, Pune
5	20FBT208	Lakshmi I J	Ojman Foodbio, Pune
6	20FBT209	Nirkayani B.	Fudtekey Solutions LLP, Khardi,
7	20FBT211	Priyanka Anand	TISS, Mumbai
8	20FBT212	Garusha Jain	Shaivaa Algaetech LLP, Gujrat
9	20FBT213	Pooja Parab	TISS, Mumbai

Evaluation of Industrial Training

- 30% Marks is given by Industry Mentor
- Two evaluators from ICT

Criteria	Details	Max. Marks
Attendance	• Attendance certificate duly signed • Regularity and Punctuality - Attentiveness and responsiveness • Communication, networking, personal grooming & professional conduct	50
Work done (based on presentation)	• Work done in various domains such as production, QA, inventory management, waste management etc	50
	• Work done in R and D, process or product or package improvement or development	50
	• Marketing - Regulatory aspects and labelling - Understanding of business & finance	50
	• Overall Involvement and initiative taken - Analytical methods performed, instruments/ equipment used - Innovation/ contribution to Industry	50
Learning (based on presentation)	• Based on questions asked# and answers given during presentation	50
Presentation	• Quality of slides (format, aesthetics) - Technical content and correctness of slides - Oral delivery - Time management	50
Report	• Representation of all given assessment criteria of IPT (as specified above) • Correctness of the document	50
	• Technical content of report - Overall learning through IPT inferred and recommendations/ suggestions given in the conclusion	50



Format I:

Evaluation of the Student Intern by Industry Mentor

Name of the Student: _____

Name and Designation of the Mentor: _____

Name and Address of Organization / Place of Internship: _____

_____

_____

Email: _____ Phone: _____

Internship Duration: Start Date: _____ End Date: _____

Please evaluate the student on following Parameters by ticking appropriate column:

Excellent: > 80%, Good: 60 – 80%, Satisfactory: 40 – 60%, Needs Improvement: < 40%

	Needs Improvement	Satisfactory	Good	Excellent
General Behavior: Ethics and Attendance				
Oral and Written Communication Skills				
Interpersonal Skills:				
Technical Knowledge				
Professional Skills: Initiative and Motivation				
Managerial Skills: Time and Resource				

Any Other Remarks: _____

Signature of the Mentor: _____

Participation of Industry Professionals

In the Program Design and Curriculum

1. Dr. Parag Saudagar Managing Director, SK BioBiz Pvt. Ltd.
2. Dr. Girish Mahajan VP, Microbiology Division, HiMedia Laboratories Pvt. Ltd., Mumbai
3. Dr. Nakul Phase Senior General Manager, Praj Industries Ltd. Pune
4. Dr. Abhishek Gupta Senior Scientist I, General Mills India Pvt Ltd., Mumbai
5. Dr. Anil Kumar Head, Tata Chemicals, Pune
6. Dr. Ganesh Ramchandran, Biocon

As External Referee for M. Tech. Thesis

Graduated year 2020

No	Name	Referee Name	Industry
1	Zumismita Kalita	Dr. Ganesh R.	Biocon
2	Chirag Anandi	Dr. Rohit Upadhyay	Nestle India
3	Logesh V. N.	Dr. Abhishek Gupta	Marico Ltd. Mumbai
4	S. Mohammad	Dr. Kiran Desai	General Mills
5	S. Seshadrinathan	Dr. Rohit Upadhyay	Nestle India
6	Srutee Rout	Dr. Nagaraj Rao	R.R Reshamia Lab.
7	Varad Bende	Dr. Ninad Pandit	Zytex Biotech.

Graduated year 2019

No	Name	Referee Name	Industry
1	Abdur Rehman Khan	Parag Saudagar	SK BioBiz
2	Bishal Prasher	Dr. Mukund Deshpande	Greenvention Biot.
3	Shreyasi Phatak.	V.G. Pendse	Food Consultant
4	Sneha Kamble	Dr. Bharati Iyer	General Mills
5	Sudharshini B.	Dr. Malathy Venkatesan	Tata Chemicals

Quality of Laboratory Work Given

FDP 2067 Food Analysis And Processing Lab

No.	Experiment	Equipment required	Stu/grp
FAP1	Analysis of milk	Gerber's centrifuge, Gerber's tubes, Oven, Muffle furnace, Silica crucibles, Water Bath	1
FAP2	Analysis of wheat flour and determination of damaged starch	Weighing balance, Water Bath, Drying oven, Planetary Mixer-Kneader, Crucibles, Muffle Furnace, Crucibles, Desiccators	1
FAP3	Analysis of tea and coffee	Muffle Furnace, Crucibles, Reflux Air Condenser, Water bath, Desiccator, Weighing balance	1
FAP4	Analysis of alcoholic beverages	pH meter, Water Bath, Pycnometer flask, Distillation unit, Hot Air oven, Desiccator	1
FAP5	Estimation of food bioactive (phenolics, pigments etc)	Orbital Shaker, Centrifuge, Separatory funnel, Eppendorf tubes, Spectrophotometer	1
FAP6	Detection of Food adulteration	Spectrophotometer, colorimeter	1
FAP7	Sensory analysis of Foods	-	1
FAP8	Development of premixes and study of traditional food	Mixer-Grinder, Hammer Mill, Water Activity Meter, Tray Drier Homogeniser, Sieves	1
FAP9	Fruit and vegetable processing: Dehydration and Product Development	Tray dryer, Weighing balance, Abbe's Refractometer, pH meter Water Activity meter	1

Quality of Laboratory Work Given

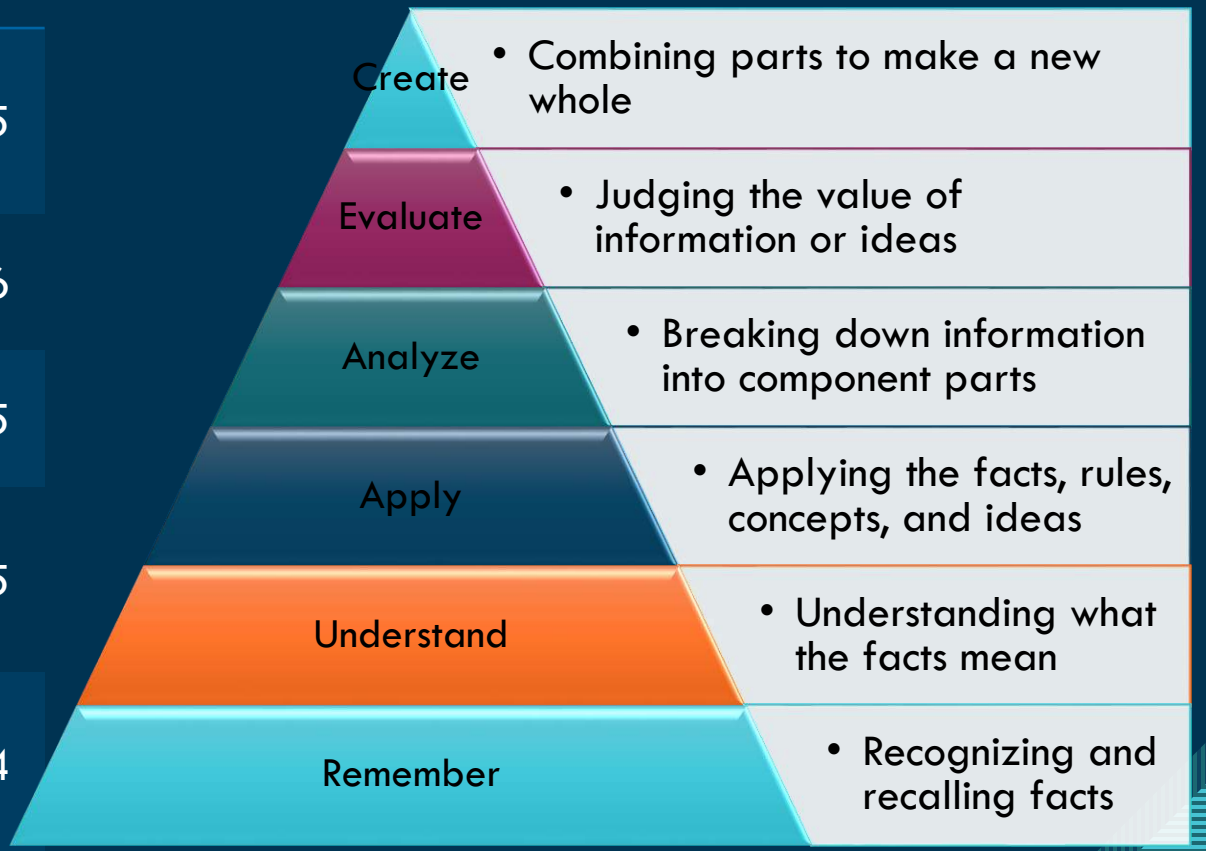
FDP 2052 Food Biotechnology Lab

No.	Experiment	Equipment	Stu/grp
FB1	Ammonium sulphate precipitation of proteins	Centrifuge	1
FB2	Discontinuous native and SDS PAGE	Casting tray, SDS PAGE unit, Geldoc	1
FB3	Isolation of genomic DNA and 2D gel electrophoresis demo	Centrifuge, 2D Gel electrophoresis unit	1
FB4	Agarose gel electrophoresis and 2D gel electrophoresis demo	Agarose electrophoresis unit	1
FB5	DNA amplification by PCR and Real Time PCR demo	PCR unit	1
FB6	Restriction digestion profiling of genomic DNA	Geldoc	1
FB7	HPLC and HPTLC separation demo	HPLC, HPTLC	1
FB8	Demo of Gel Filtration Chromatography/ IEC	Gel-filtration unit	1
FB9	Enzyme assay and factors affecting with kinetic study	Spectrophotometer	1
FB10	Application of enzyme in Fruit processing, and inactivation of enzyme by blanching	Water bath, Spectrophotometer	1
FB11	Preparation of media, sterilization, serial dilution, plating, enumeration, Gram staining	Laminar air flow, autoclave, incubator, Microscope, Haemocytometer, spectrophotometer	1
FB12	Estimation of antioxidant value by ABTS/ FRAP	Spectrophotometer	1

Criteria 2: Program Outcomes and Course Outcomes

Program Outcomes (POs)

No.	PROGRAM OUTCOMES (POS)	Level
PO1	An ability to independently carry out research or investigation and development work to solve practical problems	K5
PO2	An ability to write and present a substantial technical report or document	K6
PO3	An ability to demonstrate a degree of mastery over the area of food biotechnology	K5
PO4	An ability to use and evaluate modern techniques or tools applied in food biotechnology for product and process development and for analysis	K5
PO5	An ability to analyze problems and offer solutions related to food science, nutrition, food safety and packaging	K4



K1, remembering; K2, understanding; K3, applying; K4, analyzing; K5, evaluating; K6, creating

Connection between Courses & POs

Code	Course	Strongly Connected to				
		PO1	PO2	PO3	PO4	PO5
FDT 2056	Introduction to Food Science and Technology			✓		✓
FDT 2008	Comprehensive Techniques in Food Analysis			✓	✓	
FDT 2053	Fundamentals of Food Process Engineering			✓		
FDT 2023	Food Packaging Science and Technology			✓		✓
FDT 2021	Food Standards and Safety Regulations			✓		✓
FDP 2066	Seminar & Critical Review of one research publication	✓	✓			
FDP 2067	Practical I: Food Analysis and Processing Laboratory	✓			✓	
FDP 2068	Research I	✓	✓			
FDT 2057	Fundamentals of Food Biotechnology, Genetics and Cell Culture Technology			✓		✓
FDT 2055	Biotechnology of Fermented Foods			✓		✓
FDT 2058	Bioprocess Engineering and Technology	✓		✓		
FDT 2075	Basics of Human Nutrition			✓		✓
FDT 2002	Food Safety and Toxicology			✓		
FDP 2052	Practical II: Food Biotechnology Laboratory	✓			✓	
FDP 2069	Research II	✓	✓			
FDP 2070	Industrial Training	✓	✓			
FDP 2071	Research III	✓	✓			

Correlation between COs and POs

SEMESTER I

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2056: Introduction to Food Science and Technology	CO1	K4	3	2	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K4	3	2	3	3	3
	CO4	K3	2	2	2	2	3
	CO5	K4	3	2	3	3	3
	CO6	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3
			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2008: Comprehensive Techniques in Food Analysis	CO1	K3	2	2	2	2	3
	CO2	K3	2	2	2	2	3
	CO3	K3	2	2	2	2	3
	CO4	K5	3	3	3	3	3
	CO5	K4	3	2	3	3	3
	COURSE	K5	3	3	3	3	3
			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2053: Fundamentals of Food Process Engineering	CO1	K4	3	2	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K4	3	2	3	3	3
	CO4	K4	3	2	3	3	3
	CO5	K5	3	3	3	3	3
	CO6	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3

Correlation between COs and POs

SEMESTER I

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2023: Food Packaging Science and Technology	CO1	K4	3	2	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K4	3	2	3	3	3
	CO4	K3	2	2	2	2	3
	CO5	K4	3	2	3	3	3
	CO6	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3
			PO1	**PO2**	**PO3**	**PO4**	**PO5**
			K5	**K6**	**K5**	**K5**	**K4**
FDT 2021: Food Standards and Safety Regulations	**CO1**	**K2**	2	1	2	2	2
	CO2	**K3**	2	2	2	2	3
	CO3	**K3**	2	2	2	2	3
	CO4	**K5**	3	3	3	3	3
	CO5	**K4**	3	2	3	3	3
	COURSE	**K5**	3	3	3	3	3
			PO1	**PO2**	**PO3**	**PO4**	**PO5**
			K5	**K6**	**K5**	**K5**	**K4**
FDP 2066: Seminar & Critical Review of one research publication	**CO1**	**K4**	3	2	3	3	3
	CO2	**K5**	3	3	3	3	3
	CO3	**K6**	3	3	3	3	3
	CO4	**K5**	3	3	3	3	3
	CO5	**K6**	3	3	3	3	3
	CO6	**K5**	3	3	3	3	3
	COURSE	**K6**	3	3	3	3	3

Correlation between COs and POs

SEMESTER I

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDP 2067: Practical I: Food Analysis and Processing Laboratory	CO1	K4	3	2	3	3	3
	CO2	K5	3	3	3	3	3
	CO3	K5	3	3	3	3	3
	CO4	K5	3	3	3	3	3
	CO5	K5	3	3	3	3	3
	CO6	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3
			PO1	**PO2**	**PO3**	**PO4**	**PO5**
			K5	**K6**	**K5**	**K5**	**K4**
FDP 2068: Research I	**CO1**	K5	3	3	3	3	3
	CO2	K5	3	3	3	3	3
	CO3	K5	3	3	3	3	3
	CO4	K5	3	3	3	3	3
	CO5	K6	3	3	3	3	3
	COURSE	K6	3	3	3	3	3

Correlation between COs and POs

SEMESTER II

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2057: Fundamentals of Food Biotechnology, Genetics and Cell Culture Technology	CO1	K5	3	3	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K5	3	3	3	3	3
	CO4	K3	2	2	2	2	3
	CO5	K4	3	2	3	3	3
	CO6	K3	2	2	2	2	3
	COURSE	K5	3	3	3	3	3
			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2055: Biotechnology of Fermented Foods	CO1	K4	3	2	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K3	2	2	2	2	3
	CO4	K4	3	2	3	3	3
	CO5	K4	3	2	3	3	3
	COURSE	K4	3	2	3	3	3
			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2058: Bioprocess Engineering and Technology	CO1	K2	2	1	2	2	2
	CO2	K3	2	2	2	2	3
	CO3	K3	2	2	2	2	3
	CO4	K5	3	3	3	3	3
	CO5	K4	3	2	3	3	3
	CO6	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3

Correlation between COs and POs

SEMESTER II

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDT 2075: Basics of Human Nutrition	CO1	K5	3	3	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K5	3	3	3	3	3
	CO4	K3	2	2	2	2	3
	CO5	K3	2	2	2	2	3
	CO6	K3	2	2	2	2	3
	COURSE	K5	3	3	3	3	3
			PO1	**PO2**	**PO3**	**PO4**	**PO5**
			K5	**K6**	**K5**	**K5**	**K4**
FDT 2002: Food Safety and Toxicology	CO1	K5	3	3	3	3	3
	CO2	K3	2	2	2	2	3
	CO3	K5	3	3	3	3	3
	CO4	K4	3	2	3	3	3
	CO5	K4	3	2	3	3	3
	COURSE	K5	3	3	3	3	3
			PO1	**PO2**	**PO3**	**PO4**	**PO5**
			K5	**K6**	**K5**	**K5**	**K4**
FDP 2052: Practical II: Food Biotechnology Laboratory	CO1	K4	3	2	3	3	3
	CO2	K5	3	3	3	3	3
	CO3	K5	3	3	3	3	3
	CO4	K5	3	3	3	3	3
	CO5	K5	3	3	3	3	3
	CO6	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3

Correlation between COs and POs

SEMESTER II

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDP 2069: Research II	CO1	K4	3	2	3	3	3
	CO2	K5	3	3	3	3	3
	CO3	K5	3	3	3	3	3
	CO4	K4	3	2	3	3	3
	CO5	K5	3	3	3	3	3
	COURSE	K5	3	3	3	3	3

SEMESTER III

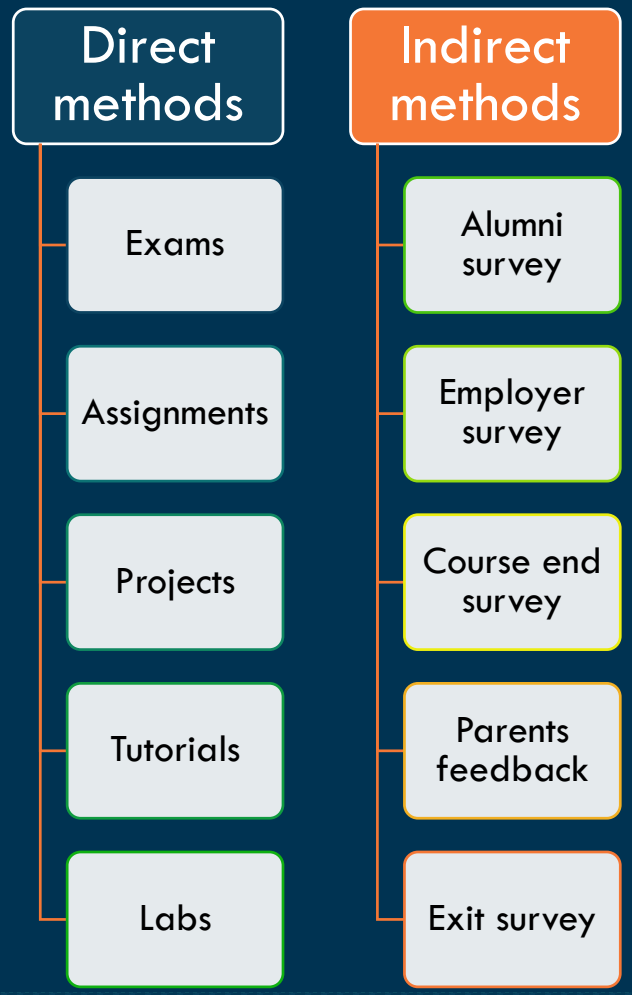
Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDP 2070: Industrial Training	CO1	K5	3	3	3	3	3
	CO2	K6	3	3	3	3	3
	CO3	K6	3	3	3	3	3
	COURSE	K6	3	3	3	3	3

SEMESTER IV

Subject			PO1	PO2	PO3	PO4	PO5
			K5	K6	K5	K5	K4
FDP 2071: Research III	CO1	K3	2	2	2	2	3
	CO2	K5	3	3	3	3	3
	CO3	K6	3	3	3	3	3
	CO4	K6	3	3	3	3	3
	COURSE	K6	3	3	3	3	3

Modes of Course Delivery & Attainment Tools

- Class-room teaching
- Assignments
- MCQ tests
- Quiz
- Student projects and presentations
- Group discussion
- Case studies
- Experimental laboratory work



CO Attainment Methods

Assessment tools used to measure the student learning and Course Outcomes:

- End Semester exam: End Semester Score (25 M)
- Continuous Evaluation: Score for Continuous (10 M) + Mid semester Examination (15 M)

Step 1

- Percentage weightage (W) has been given to each of the COs of a course corresponding to each question asked in end semester question paper.

Step 2

- Matrix showing Question wise marks for each student.

Question No.	Max Marks	CO1	CO2	CO3	CO4	CO5
Q1.	5		20%	40%	20%	20%
Q2.	5		50%	50%		
Q3.	5	50%	50%			
Q4.	5	50%				50%
Q5.	5					100%
Total no of students 10						

CO Attainment Methods

Step 3

- Calculation of CO wise score from Question wise marks. It is calculated as shown here:

$$S_{CO_{ij}} = \sum_{i=1}^{5}\sum_{j=1}^{10}\sum_{k=1}^{5} S_{Q_{ij}} \times W_{iQk}$$

$$S_{CO_{ij}} = S_{Q_{ij}} \times W_{iQ1} + S_{Q_{2J}} \times W_{iQ2} + S_{Q_{3j}} \times W_{iQ3} + S_{Q_{4j}} \times W_{iQ4} + S_{Q_{5j}} \times W_{iQ5}$$

$$S_{CO_{ij}} = \frac{1}{j}\left(\sum_{j=1}^{10} S_{CO_{ij}}\right)$$

Where, W_{iQk}= percent weightage given to i^{th} CO corresponding to k^{th} question (Q_k);
S_{Qkj} = Score obtained by j^{th} student corresponding to k^{th} question (Q_k)
S_{COij} = Score obtained by j^{th} student corresponding to i^{th} CO
s_{COi}=Average of S_{COij} obtained for the entire class corresponding to Co_i

Step 4

- Counting % of students (m) scoring at least class average score of corresponding to COi.

If % of student scoring at least class average (m)	Attainment assigned to a_i
m ≥ 60%	3
50% ≤ m ≤ 59%	2
40% ≤ m ≤ 49%	1

CO Attainment Methods

Step 5

- Steps I to IV are followed for Continuous evaluation & Mid Semester marks.

Step 6

- Calculation of Attainment of CO, as given below.

$$A_{CO_i} = a_{iES} \times W_{ES} + a_{iCA} \times W_{CA}$$

Where,

a_{iES}=Attainment assigned to i^{th} CO from End Semester Marks;

w_{ES}=Weightage of Attainment from End Semester marks = 0.8;

a_{iCA}=Attainment assigned to i^{th} CO from Continuous + Mid Semester Marks;

w_{CA}=Weightage of Attainment from Continuous + Mid Semester Marks = 0.2

Step 7

- Calculation of Attainment of Course (A_{course}), as shown.

$$A_{course} = \frac{A_{CO1} + A_{CO2} + A_{CO3} + A_{CO4} + A_{CO5}}{5}$$

Sample CO Attainment Calculation

AY 2017-19: Semester I
Course: FDT 2056-Introduction to Food Science and Technology
Number of COs: **6**
Total number of students: **09**

Step I: Question pattern: All questions are compulsory.

End Semester: CO-Question Mapping

Question No.	Max Marks	CO1	CO2	CO3	CO4	CO5	CO6
Q.1	6	10%	10%	40%	20%	-	20%
Q.2	6	10%	20%	-	20%	20%	30%
Q.3	5	10%	30%	20%	-	30%	10%
Q.4	8	20%	10%	10%	20%	20%	20%

Continuous Evaluation and Mid Semester: CO-Question Mapping

	Marks	CO1	CO2	CO3	CO4	CO5
Continuous Evaluation	10	16.6%	16.6%	16.6%	16.6%	16.6%
Mid semester	15	16.6%	16.6%	16.6%	16.6%	16.6%

Sample CO Attainment Calculation

Step II: Students marks obtained

ROLL NO	End Semester Mark (25)				Continuous Evaluation (10)	Mid Sem (15)
	Q1	Q2	Q3	Q4		
17FBT201	1	3	0	4	8	8
17FBT203	3	4	2.5	6.5	9	12
17FBT204	3	4.5	3.5	8	9	11
17FBT205	6	3.5	3.5	6.5	9	14
17FBT206	3.5	3.5	4	7	9	14
17FBT207	4	4.5	1	5.5	9	10
17FBT208	3.5	4	0	5.5	9	12
17FBT209	3.5	3.5	4	6	9	14
17FBT210	4.5	3.5	2.5	5.5	8	11

$$S_{CO_{21}} = 0.1 \times 1 + 0.2 \times 3 + 0.3 \times 0 + 0.1 \times 4 = 1.10$$

Step IV: Calculation of Attainment of Course Outcome (a_i)

ROLL NO	End Semester Mark (25)					
	CO1	CO2	CO3	CO4	CO5	CO6
17FBT201	1.2	1.10	0.80	1.60	1.40	1.90
17FBT203	2.25	1.10	2.35	2.70	2.85	3.35
17FBT204	2.70	2.50	2.70	3.10	3.55	3.90
17FBT205	2.60	3.05	3.75	3.20	3.05	3.90
17FBT206	2.50	3.00	2.90	2.80	3.30	3.55
17FBT207	2.05	2.95	2.35	2.80	2.30	3.35
17FBT208	1.85	2.15	1.95	2.60	1.90	3.00
17FBT209	2.30	1.70	2.80	2.60	3.10	3.35
17FBT210	2.15	2.85	2.85	2.70	2.55	3.30
Class average (s_{COi})	2.18	2.27	2.49	2.68	2.67	3.29
No of students scored ≥ S_{COi}	5	5	5	6	5	6
Total no of student	9	9	9	9	9	9
% students (m) scored ≥ S_{COi}	55	55	55	66	55	66

(%m>65=3; %m (51-65)=2; %m<50=1)

Sample CO Attainment Calculation

Step V-VII: Calculation of Attainment

	CO1	CO2	CO3	CO4	CO5	CO6
CO Attainment from End Semester (a_{iES})	2	2	2	3	2	3
CO Attainment from Cont Eval + Mid Semester (a_{iCA})	2	2	2	2	2	2
Attainment of CO	2x0.8+2x0.2	2x0.8+2x0.2	2x0.8+2x0.2	3x0.8+2x0.2	2x0.8+2x0.2	3x0.8+2x0.2
Attainment of CO (A_{COi})	2	2	2	2.8	2	2.8
Attainment of Course (A_{course})	(2+2+2+2.8+2+2.8)/6 = **2.27**					

PO Attainment Methods

Assessment tool	Details	Frequency	Related POs	Weightage
Direct	Based on examination results	Every semester	PO1 to PO5	80%
Indirect	Exit student feedback at the time of convocation	Every year	PO1 to PO5	10%
Indirect	Feedback from Alumni / Examiner / Industry Mentor	Every year	PO1 to PO5	10%

PO Attainment Methods

$$Direct\ PO\ attainment\ (PO_D) = \frac{\sum_{p=1}^{n}([A_{course}] \times C_p)}{\sum_{p=1}^{n} C_p}$$

Where, n= number of Courses correlated to corresponding PO; A_{course} = Obtained attainment for p^{th} course (0 to 3 scale); C_p = Correlation of p^{th} course to corresponding PO in (0 to 3 scale), where, 3, 2, 1 stands for strong, medium, and weak correlation, respectively.

$$a_{IPO_i} = \frac{3}{5N}\sum_{j=1}^{N}\sum_{k=1}^{9} S_{QF_{kj}} \times W_{iQF_k}$$

$$= \frac{3}{5N}\left[S_{QF_{1j}} \times W_{iQF1} + S_{QF_{2j}} \times W_{iQF2} + \cdots + S_{QF_{9j}} \times W_{iQF9}\right]$$

Where, N= number of students giving Student exit feedback

a_{IPO1} = Indirect PO attainment of ith PO from Feedback 1

S_{QF} = Score obtained from student exit feedback in the scale of *5*

Q= number of questionaries' in feedback

W_{iQF} = weightage of k^{th} feedback question for i^{th} PO

$$Indirect\ PO\ attainment\ (PO_I) = \frac{a_{IP01+a_{IPO2}}}{2}$$

$$A_{PO} = PO_D \times w_D + PO_I \times w_I$$

w_D = Weightage of Direct Attainment of PO = 0.8;

w_I = Weightage of Indirect Attainment of PO = 0.2;

Sample Feedback & Weightage to POs

Survey I: Questionnaires' for Student Exit Feedback

No.	Details of Ability	5. Excellent	4. Good	3. Satisfactory	2. Needs Improvement	1. Poor	Relevant PO	Weightage (W_{iQF})
1	To carry out research						PO1	0.5
2	To solve practical problems						PO1	0.5
3	To write technical document						PO2	0.5
4	To present a technical topic						PO2	0.5
5	To use modern analytical techniques						PO4	0.3
6	To use sophisticated or statistical tools						PO4	0.3
7	Mastery on food safety & regulation						PO5	1
8	Mastery on bioprocessing, food packaging & analysis						PO4	0.4
9	Mastery on food biotechnology						PO3	1

Sample PO Attainment Calculation

Direct Attainment of PO1

Code	Course	Level	Correlation with PO1	Attainment
FDT2056	Introduction to food science and technology	K5	3	2
FDT2008	Comprehensive techniques in food analysis	K5	3	1.5
FDT2053	Fundamentals of food process engineering	K5	3	2
FDP2067	Food analysis and processing laboratory	K5	3	2
FDP2066	Seminar & Critical Review of one research Publication	K6	3	2
FDP2068	Research I	K6	3	2
FDT2058	Bioprocess engineering and technology	K5	3	1.5
FDT2055	Biotechnology of fermented foods	K4	3	2
FDT2002	Food saftey and toxicology	K5	3	1.5
FDP2052	Food Biotech Lab	K5	3	2
FDP2069	Research II	K5	3	2
FDP2070	IN- PLANT TRAINING	K6	3	2
FDP 2071	Research III	K6	3	2
FDT2057	Fundamentals of food biotechnology, genetics and cell culture technology	K5	3	1.5
FDT2021	Food standard and safety regulations	K5	3	1.5
FDT2023	Food packaging science and technology	K5	3	1.5
FDT2075	Basics of human nutrition	K5	3	1.5
			sum = 51	
	Direct PO1 Attainment = (3x2+3x1.5+3x2+…..+3x1.5)/ 48 =			**1.81**

Sample PO Attainment Calculation

Student Exit Feedback Survey 1:

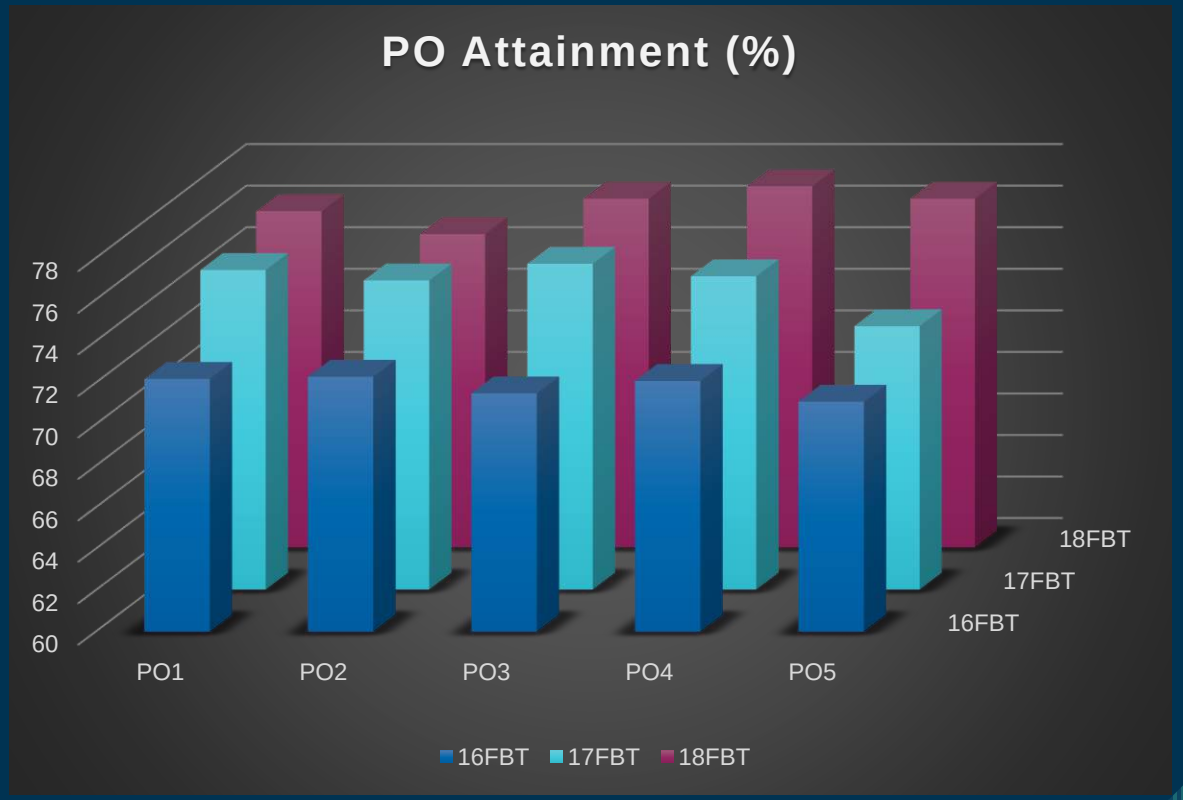
Q.No.	Details of Ability	Relevant PO	Weightage	Scores out of 5								
				S1	S2	S3	S4	S5	S6	S7	S8	S9
1	To carry out research	PO1	0.5	5	4	4	5	5	4	5	5	4
2	To solve practical problems	PO1	0.5	4	4	4	5	5	5	4	5	4
3	To write technical document	PO2	0.5	4	4	4	4	4	4	4	4	4
4	To present a technical topic	PO2	0.5	5	3	4	4	4	2	4	4	4
5	To use modern analytical techniques	PO4	0.3	5	4	5	5	4	4	3	5	4
6	To use sophisticated or statistical tools	PO4	0.3	4	5	4	4	5	4	3	3	4
7	Mastery on food safety & regulation	PO5	1	4	3	4	4	2	3	4	2	3
8	Mastery on bioprocessing, food packaging & analysis	PO4	0.4	4	4	5	5	4	3	4	3	4
9	Mastery on food biotechnology	PO3	1	4	4	4	4	4	4	4	4	4

PO	a_{IPO}
PO1	1.97
PO2	2.39
PO3	2.55
PO4	2.94
PO5	2.97

Direct PO1 Attainment				**1.81**
Indirect PO1 Attainment	Survey I	Student Exit Feedback	2.7	2.6
	Survey II	Alumni Feedback	2.5	
Overall Attainment of PO1 (A_{PO1})		= 1.81x0.8+2.6x0.2		1.97

Overall PO Attainment

% Overall PO Attainment					
Batch	PO1	PO2	PO3	PO4	PO5
16FBT	72.2	72.3	71.5	72.1	71.1
17FBT	75.4	74.9	75.7	75.1	72.7
18FBT	76.2	75.1	76.8	77.4	76.8



Criteria 3: Students' Performance

Intake & Admission

Item	AY 2020-21	AY 2019-20	AY 2018-19	AY 2017-18	AY 2016-17
Sanctioned intake of the program (N)	10	10	10	10	10
Total number of students admitted through GATE (N1)	10	10	10	10	10
Total number of students admitted through PG Entrance and others (N2)	-	-	-	-	-
Total number of students admitted in the Program (N1 + N2)	10	10	10	10	10
GATE Qualified (N1/N)	100%	100%	100%	100%	100%

Number of Students Successfully Graduated

Year of entry	N1 + N2 (As defined above)	Number of students who have successfully graduated	
		I Year	II Year
2020-21	10	9	In process
2019-20	10	10	8
2018-19	10	9	9
2017-18	10	9	10
2016-17	10	10	10

Success Rate

Item	AY 2019-20	AY 2018-19	AY 2017-18	AY 2016-17
Number of students admitted in first year of same batch (X)	10	10	10	10
Number of students completing program in stipulated duration	8	9	10	10
S.I.	0.8	0.9	1	1

S.I. = Number of students completing program in stipulated duration/ Number of students admitted in first year of same batch; Average S.I.= Mean of SI for past 3 Batches Assessment points = 20 X Average S.I.

Placement Details

Item	Graduating in AY		
	2019-20	2018-19	2017-18
The total no. of students admitted in first year (N)	10	10	10
No. of students placed in companies or Government Sector (X)	7	6	7
No. of students pursuing Ph.D. / JRF/ SRF(y)	1	2	2
No. of students turned entrepreneur in engineering/technology (Z)	0	1	1
Placement Index: (x + y + z) /N	0.8	0.9	1
Average placement= (P1 + P2 + P3)/3	0.9		
Assessment Points = 20 × average placement	0.9 x 20 = 18		

Major Companies

Mondelēz International, AAK KAMANI, marico, evo, THINKINGFORKS, DÖHLER NATURAL FOOD & BEVERAGE INGREDIENTS, ITC Limited, VKL Behind every great taste, TATA CHEMICALS LIMITED, Biocon, Keva, FIZZY FOODLABS, EVALUESERVE POWERED BY MIND+MACHINE, GENERAL MILLS

Placement Details

Batch 2016-2018

No	Name of the student placed	Enrollment no.	Name of the employer
1	Alisha Sukhija	16FBT201	Mondelez International
2	Harsha Bharwani	16FBT202	BITS Pilani, Hyderabad
3	Mukesh Patel	16FBT203	Shivanika Food Pvt. Ltd
4	Nitin Sangle	16FBT204	Healthviser Pvt. Ltd. Mumbai
5	Prabhat Chauhan	16FBT205	Evaluserve SEZ (Gurgaon) Pvt. Ltd.
6	Sana Shaikh	16FBT206	Evaluserve SEZ (Gurgaon) Pvt. Ltd.
7	Lubna Shaik	16FBT207	ICT, Mumbai
8	Shraddha Srinivasan	16FBT208	FSSAI
9	Shubham Gaikwad	16FBT209	OSI Group, India
10	Sumita Kumari	16FBT210	Vatskashyap Foods Pvt Ltd

Placement Details

Batch 2017-2019

No.	Name of the student placed	Enrollment no.	Name of the employer
1	Abdur Rehman Khan	17FBT201	Coaching class
2	Bishal prasher	17FBT203	Mondelez International
3	Deep Dave	17FBT204	Evo Foods
4	Lathika G. V.	17FBT205	ICT Mumbai
5	Shreyasi Phatak	17FBT206	Kay Bee Exports, Thane
6	Shriya Das	17FBT207	IIT Guwahati
7	Sneha Kamble	17FBT208	Zywie Ventures Pvt. Ltd
8	Stuti Agarwal	17FBT209	Waffles and Pancakes Your way, Jhansi
9	Sudharshini B.	17FBT210	Food Buddies

Placement Details

Batch 2018-2020

No.	Name of the student placed	Enrollment no.	Name of the employer
1	Aayushi Pal	18FBT201	NA
2	Chirag Anandi	18FBT202	GoAanam International Merchendise LLP
3	Logesh V. N.	18FBT203	ThinkingForks, Bengaluru
4	Shahrukh Mohammad	18FBT204	Sahayog Health Foods
5	Mona Kokwar	18FBT205	AVKL Food solutions Enterprise, Mumbai
6	Shruthy Seshadrinathan	18FBT206	Biocon Biologics, Bangalore
7	Srutee Rout	18FBT207	IIT Kharagpur
8	Varad Bende	18FBT208	ITC, Bangalore
9	Zumismita Kalita	18FBT209	Inventia Healthcare Limited, Thane

Publication in Technical Magazine & Newsletter

Bombay Technologist Journal

It is the in-house peer reviewed research Journal of the Institute of Chemical Technology published semi-annually.

Professional Societies and Organizing Events

VORTEX (Technical Fest)

- Industry Defined Problems
- Master Class - Lecture Series
- Papyrus : Oral Presentations
- Manifesto : Poster Presentations
- PharmWiz (Quiz Competitions)
- Quantity Sufficient (QS)

Professional Societies and Organizing Events

Inter-Institutional Competitions/Activities

Name of the Activity	Number of students	Recognition/ Rewards received
Prodigy	All	Yes
Chemfusion	All	Yes
Manzar	All	Yes
Vortex	All	Yes
Exergy (2012)	All	Yes
IDP (Industry Defined Problems)	All	Yes
Sportsaga	All	Yes
Rasayam	All	Yes
Texquest	All	Yes

Inter-Department Competitions/Activities

Name of the Activity	Number of students	Recognition/ Rewards received
Annual Day	All	Yes
Funtech	All	Yes
Manthan	All	Yes

Intra-Department Competitions/Activities

Name of the Activity	Number of students	Recognition/ Rewards received
World Food Day	All	Yes
In-house Seminar	All	Yes
Texpression	All	Yes

Magazines

- For many years, SPIRIT has been the official student-run newsletter of the Institute of Chemical Technology (ICT)
- Switched to this online version which enables to share stories with everyone on the internet – that being a very large number
- UDAAN, Hindola

Technical Events

Student Extra- Curricular Activity

- Art Club of ICT
- Music Club of ICT
- Literary Club of ICT
- Manthan (Marathi Club)
- Manzar (Cultural Festival)
- SPORT-saga
- Nature Trek
- Hostel Day Celebrations
- Festivals & Historical events
- Clean Up Drive

Self Learning & Tutorials

1. Industry visits and tours
2. Regular lectures by industry persons
3. Guest lectures by scientists from reputed institutes across the globe
4. Students solve Industry defined problems
5. Number of tutorial classes per subject per week is 1
6. Reading room facility with books, journals & e-resources
7. Online subscription – access given to students (library)

Professional Activities by M. Tech. Students

- Workshop on Sensory Analysis, 18 December 2019 organized by SIES, Sion, Mumbai.
- Poster Presentation at Bioprocessing India Conference, 14-16 December 2019 organized by CSIR-CFTRI, Mysore
- Workshop on food preservation techniques was jointly organized in association with BIRAC and FETD on 26 February 2018.
- A workshop on 'Analytical and preparative instrumentation for the food industry' was conducted by Anton Paar on 27th February 2017 in FETD, ICT, Mumbai.
- FETD, ICT organized a hands-on training for analysis of food bioactive on 2-4 March 2017 with the assistance of TEQIP.
- DuPont Nutri Scholars Awards 2017
- "National Nutrition Week" and "World Food Day" which is organized by AFSTI at ICT, Mumbai
- One-day in-house seminar on "Uprising Drift in the Path of Food Biotechnology and Fermentation Technology" on 26th December 2018 at ICT Mumbai
- New Product Development workshop, 16 March 2019
- Saturday Lecture Series
- Online In-plant training, online industrial visits and online certificate courses





Student's Publications

1. Shraddha Srinivasan, Kriti Kumari Dubey and Rekha S. Singhal. (2019). Influence of food commodities on hangover based on alcohol dehydrogenase and aldehyde dehydrogenase activities. Current Research in Food Science, 1, 8-16.
2. Garg, D., Chakraborty, S., & Gokhale, J. S. (2020). Optimizing the extraction of protein from Prosopis cineraria seeds using response surface methodology and characterization of seed protein concentrate. LWT, 117, 108630.
3. S. Rout, R. S. Soumya and U. S. Annapure (2021) Clean meat: techniques for meat production and its upcoming challenges. Animal Biotechnology, 13, 3041-3058.
4. Chakraborty, S., Shaik, L., & Gokhale, J. S. (2021). Subcritical Water: An Innovative Processing Technology.
5. Logesh V N and J. S. Gokhale. (2022) Rheological, techno-functional, and physicochemical characterization of Prosopis cineraria (Sangri) seed gum: A potential food and pharmaceutical excipient. Accepted to Journal of Food Processing & Preservation.
6. Lakshmi J., S. Kazi and J. S. Gokhale (2022) Microfluidics for detection of food pathogens: Recent trends and opportunities, Food Research International (Under review).
7. Seshadrinathan S. and Chakraborty S. (2022) Fermentative Production of Erythritol from Molasses using Optimization, Partial Purification and Characterization. Food Technology and Biotechnology (Under review).
8. Logesh V N, D. Venketachalam and J. S. Gokhale (2022) Plant-Based Meat Alternatives: Sustainability, Sourcing, Processing, Nutritional and Organoleptic implications. Food Bioscience (Under review)

Criteria 4: Faculty Contribution

Core and associated Faculty

Prof. R. S. Singhal
Professor of Food Technology & Head, FETD

Prof. L. Ananthanarayan
MTech FBT Course Coordinator & Professor in Applied Biochemistry

Prof. U. S. Annapure
Director, ICT Marathwada Campus, Jalna & Professor in Food Chemistry

Prof. S. S. Lele
Emeritus Professor of Biochemical Engineering

Dr. S. S. Arya
Assistant Professor in Food Technology

Dr. Jyoti Gokhale
UGC Assistant Professor

Dr. Snehasis Chakraborty
Assistant Professor

Prof. P. S Kharkar
Professsor of Medicnal Chemistry

Dr. Gunjan Prakash
Associate Professor

Dr. Ratnesh Jain
UGC Assistant Professor

Faculty Profile

Name of Faculty	Highest Qualification	University	Year of graduation	Designation	Date of joining
Prof. R. S. Singhal	PhD	University of Mumbai	1990	Professor	14.3.1990
Prof. Smita S. Lele	PhD	University of Mumbai	1989	Professor	16.11.1986
Prof. Uday S. Annapure	PhD	University of Mumbai	2001	Professor	15.04.2003
Prof. Laxmi Ananthanarayan	PhD	University of Mumbai	2010	Professor	16.10.1985
Dr. Shalini S. Arya	PhD	University of Mumbai	2008	Assistant Professor	25.7.2008
Dr. Jyoti Gokhale	PhD	University of Mumbai	2011	Assistant Professor	16.6.2014
Dr. Snehasis Chakraborty	PhD	IIT Kharagpur	2015	Assistant Professor	29.10.2015
Dr. Prashant Kharkar	PhD	University of Mumbai	2004	Professor	19.10.2019
Dr. Gunjan Prakash	PhD	IIT Delhi	2007	Associate Professor	09.02.2009
Dr. Ratnesh Jain	PhD	University of Mumbai	2009	Assistant Professor	01.01.2012

Faculty Profile

PROF. REKHA S. SINGHAL
B.Sc. (Hons), M.Sc. (Tech), Ph.D. (Tech)
Professor of Food Technology,
Head, Department of Food Engineering & Technology
rs.singhal@ictmumbai.edu.in; rsinghal7@rediffmail.com

Research Students		Publications	Google scholar/Scopus	Patents
Ph.D.	Completed:42 Ongoing: 11	Research Article: 402 Review Article: 37 General Articles: 16 Book: 02 Chapter: 42	Citation: 21801/13608 h-index: 71/53 i-10 index: 296	Granted: 01 Applied: 02
M.Tech	Completed:105 Ongoing:18			

Projects Undertaken	Title
Reliance Industries Ltd.	Supercritical carbon dioxide extraction of Astaxanthin
Marico Industries Ltd.	Extraction of Proteins
BBSRC-GCRF	Enhancing cobalamin (vitamin B12) bioavailability in culturally appropriate foods in India.
THINQ-Pharma India-CRO Ltd.	Anti hangover ingredients : Understanding the Mode of Action and Development of Product Formulation.
UGC India	Centre of Advanced Studies Phase II

RESEARCH ACTIVITIES:

Food Quality, Food Chemistry, Biopolymers, Lipid Chemistry and Technology, Food Product Development, Food Processing, Fermentative production & Downstream processing of Biomolecules, Food Biotechnology, Enzyme modification and stabilization, Enzyme mediated biotransformation, etc.

MAJOR ACHIEVEMENTS:

- UAA-ICT Distinguished Alumnus Award, Category: Academics-UDCT Alumni Association, for the year 2021.
- Elected as Fellow of the Indian National Science Academy on October 5, 2021.
- Fellow of the International Bioprocessing Association- An International Forum on Industrial Bioprocesses, for the block years 2017-2018.
- Prof. Man Mohan Sharma Award for the year 2015, conferred on January 15,2016.

PROJECT + CONSULTATION:

Reliance Industries Limited · Hindustan Unilever Limited · marico · THINQ

Research Group : Top left to right-Abhijeet Muley, Armaan Shaikh, Vikramaditya Shirsat, Abhinav Sharma, Manoj Dev, Shubham Mishra, Akash Kshirsagar Shubham Savardekar, Amruta Bawne, Sakshi Singh, Aratrika Ray, Prof Rekha Singhal, Sukitha A., Anjali Barela, Pratibha Prajapati, Seema Bajaj
Other students: Ketan Mulchandani, Saaylee Damait, Shilpa Jana, Krushna Gharat, Rupsa Roychowdhury, Sandhya KR

Faculty Profile

Professor Laxmi Ananthanaryan

Professor of Biochemistry
B. Sc. (Hon) B.Sc. (Tech.)
M. Sc. (Tech.)
Ph.D.

Department of Food Engineering & Technology
Email: l.ananthanarayan@ictmumbai.edu.in
Contact: 022-33611111 Ext: 2506

Research & Teaching Experience: 37 years
Subjects Taught: Nutrition; Food Biotechnology; Food Packaging
Practical: Biochemistry, Food Biotechnology;

Publications
Research Articles: 81 Book chapters: 03 Books: 01
Research Students:
Ph.D: 16 (Completed); 01 (Ongoing)
Masters: 84 (Completed) 03 (ongoing)

Research group

Research Interest
Human nutrition; Food packaging; Enzymes in the Food Industry

Achievements
- N. R. Kamath Book Author Award 2020-21
- Dupont Nutrischolar Award under the category of Most Nutritious Food idea for the product "Soyabean Rasgulla"

Ongoing Projects
- Studies in development of spray dried probiotics in cultured milk
- Studies in incorporation of vegetable pulps in cold extruded products
- Isolation and characterization of microbial strains from fermented foods

Faculty Profile

DEPARTMENT OF FOOD ENGINEERING AND TECHNOLOGY

ESTD. 1943

PROF. (Dr.) UDAY S. ANNAPURE
Director, Institute of Chemical Technology (ICT),
Marathwada Campus, Jalna, Maharashtra
B.Tech, M.Sc.(Tech), Ph.D.(Tech)
us.annapure@ictmumbai.edu.in

RESEARCH INTERESTS

Cold Plasma in Food Processing
Extrusion Processing – Process and Product Development
Drying and dehydration of foods. Frying - Chemistry and Technology
Nutraceuticals – Chemistry, Technology and Product Development
Carbohydrates - Chemistry and Technology of minor grains and tubers.

Research Projects- Completed

Gov: UGC, MoFPI
Private: Aditya Birla, Adivasi Foods, Himedia, Ghavda Chemicals, Tata Chemicals, Kancor Ingredients

Research Projects- Ongoing

Governement-
Private: Exotic Fruits Pvt. Ltd., Mumbai, Vitanutrix Foods and Feeds Pvt. Ltd., Pune, Orchard Brands Pvt. Ltd. Mumbai

Research Students		Publications	Google Scholar
Ph.D	Completed - 16 Ongoing - 20	**Research Articles** : 112 **Review Articles** : 19 **Book Chapters**: 7 **Patents applied**: 3	**Citations** : 3581 **H-index**: 33 **i-10 Index** : 59
M.Tech.	Completed – 81 Ongoing - 17	**Govt.Projects:** 06 03(Completed) 03(ongoing) **Private Projects** :13 05 (Ongoing) 08 (Completed)	**Conference Proceedings** : 67

MAJOR AWARDS

- Fellow of Maharashtra Academy of Science (2017)
- Recipient of the Best Teacher Award (Professor D.V. Rege–AFST Mumbai Chapter–2011 Endowment) 2016,2014
- Recipient of BOYSCAST Fellowship from DST, Govt. of India in 2010
- Awarded TEQIP fellowship, July 2017
- Recipient of Achievement Award by CFT-PBN, College of Food Technology, MAU, Parbhani in 2008

Faculty Profile

Dr. Shalini S. Arya

B. Tech., M. Tech., Ph.D. (Tech), CNPq-TWAS Post Doctoral Fellow

Assistant Professor in Food Engineering and Technology

ss.arya@ictmumbai.edu.in

Course	Research Students		Publications	Google scholar/ Scopus	Patents
Ph.D.	Completed: 06	Ongoing: 04	International: 96 National: 10 Book Chapters: 04	Citation: 1900 H-index:23 i-10 Index: 41	Granted: 0 Applied: 0
M. Tech.	Completed: 43	Ongoing: 27			

Project Undertaken	Title	Amount	Status
Department of Science and Technology- SERB	Novel, non-thermal, energy efficient, industrially scalable hydrodynamic cavitation (HC) processing of milk for enhanced nutrients and shelf life extension.	31,00,000/-	Ongoing
TEQIP-III, ICT, Mumbai	Novel, green, cloud point extraction of bioactives from fruit industry waste	6,57,000/-	Ongoing
Ministry of Food Processing	Novel, non-thermal energy efficient industrially scalable hydrodynamic cavitation (HC) processing of apple juice for enhanced nutrients and shelf life	44,09,680	Completed
AICTE	Design of novel functional food supplements from edible flowers using extraction and encapsulation technologies to be used in prevention of type II diabetes	7,08,235	Completed
UGC	Studies in development of low glycemic index bhakri	1,35,000	Completed

Memberships

- Member, Global Young Academy
- Member, Indian National Young Academy (INYAS), INSA, New Delhi, Government of India
- Member, Association of Food Scientists and Technologists (APSTI), India

Consultations

BÜHLER

TATA TRUSTS

Faculty Profile

Dr. Jyoti Sontakke-Gokhale

UGC Assistant Professor

B. Pharm 2004
M. Tech. 2006
Ph.D. 2011

Department of Food Engineering & Technology
& Department of Chemical Engineering
Email: js.gokhale@ictmumbai.edu.in
Contact: 022-33611111 Ext: 2510

Research Experience: 10 years; **Teaching Experience:** 7 years

Subjects Taught: Nutrition; Food Biotechnology; Waste Management; Design & Analysis of Experiments; Biotechnology of Fermented Foods; Fermentation Technology; Nutraceuticals and Functional Foods; Principles of Food Analysis

Practical: Biochemistry, Technical Analysis, Microbiology, Food Biotechnology; Food Analysis Lab II

Publications

Research Articles: 12 Book chapters: 5

Research Interests

Biocatalysis; Chiral Technology; Waste management; Fermentation Technology; Food Biotechnology; Thermal & Non- thermal processing of foods; Green Technology

Research Students: Ph.D: 2 (ongoing); Masters: 9 (Completed) 5 (ongoing)

Research Group

Research Interest

Biocatalysis; Waste Management; Nutraceuticals; Fermentation

Projects Undertaken	Title	Role	Status
MoFPI	Resolving gaps in scaling up of millet value chain for technical backstopping micro units under PMFME	PI-2	Ongoing
CSIR	Optimizing the Fermentative Production of Dextran using Fruit-waste and its Food Application	CO-PI	Ongoing
RGSTC	An Integrated approach for utilization of waste from Mango processing industry	CO-PI	Ongoing
RGSTC	Techno-commercial Viability Studies for Small Scale Fruit Winery	Co-PI	Completed
Praj Industries	Extraction and Characterization of Extracted proteins	PI	Completed
Vegannotive Pvt. Ltd.	Develpoment of Vegan Milk Alternative	PI	Completed

Faculty Profile

Institute of Chemical Technology

University under Section 3 of UGC Act 1956 | Elite Status and Centre Excellence, Govt. of Maharashtra | NAAC A++ CGPA 3.77/4.00

Department of Food Engineering and Technology

Mumbai - 400019, India | Website: www.ictmumbai.edu.in

Dr. Snehasis Chakraborty

Ph.D., M.Tech, B.Tech, BSc.

Assistant Professor of Food Technology

sc.chakraborty@ictmumbai.edu.in (O), snehasisftbe@gmail.com (P)

+91-22-3361-2513 (O), +91-22-3361-1012 (Res)

Research Supervision		
Ph.D	Completed: 00	Ongoing: 08
M. Tech	Completed: 10	Ongoing: 08
B.Tech	Completed: 12	Ongoing: 04

Research Interests

- High Pressure Processing
- Pulsed Light Treatment
- Kinetic Modelling
- Process Optimization
- Sensory evaluation

Publications Details		Conferences and Citation Details	
International Peer Reviewed Journal	41	Conference Presentation	22
Book and Book Chapters	10	Google Scholar Citations (since 2017)	712
Textbook	1	h-index (since 2017)	15
Patent Applied	2	i-10 index (since 2017)	18

Projects Undertaken	Title	Role	Status
CSIR	Optimizing the Fermentative Production of Dextran using Fruit-waste and its Food Application	PI	Ongoing
MoFPI	Integrated Processing of Beverages from Minor Tropical Fruits and Shelf-Life Extension	PI	Completed
SERB	Pulse light treatment of beverages from underutilized tropical fruit	PI	Completed
Godrej & Boyce Mfg Co Ltd	Parametric study and data analysis in the process of developing cooking aids	Co-PI	Completed
Shivanika Foods Pvt. Ltd	Development of Plant Based Egg Alternatives	PI	Completed
Vegannotive Pvt. Ltd.	Development of Vegan Milk Alternative	Co-PI	Completed

Major Achievements

- Winner of "Young Researcher" in International Conference on TIFH 2019 at Tezpur University - 2019
- Best Teacher Award in Dept of Food Engg & Tech, ICT Mumbai 2018-19 & 2019-20
- Publon Global Peer Review Award - Top 1% reviewer in Agriculture Science - 2018
- Jawaharlal Nehru Outstanding PhD Thesis award in Agricultural Engineering, ICAR - 2017
- DAAD Scholarship Holder - 2011-12 & 2018

Updated in February 2022

Associated faculty

PROF. PRASHANT S. KHARKAR

B. Pharm. (Pune, 1998),
M. Pharm. Sci. (Pharmaceutical Chemistry) (Mumbai, 2000),
Ph. D. (Tech.) (Pharmaceutical Chemistry) (Mumbai, 2004)

Nodal officer

Professor of Medicinal Chemistry

Subjects Taught:

Medicinal Chemistry, Pharmaceutical Organic Chemistry, Pharmaceutical Analysis and Green Chemistry, Biopharmaceutics and Pharmacokinetics

Research Interests:

Design and Development of New Chemical Entities (NCEs) as Anticancer Agents, Cancer Stem Cell (CSC) Inhibitors; Computer-Aided Molecular Design; Synthesis of New Materials and their Biomedical Applications; Drug Repurposing

Recognized Research guide for : Ph. D. (Tech.) in Medicinal Chemistry, Pharmaceutical Chemistry, Biotechnology and Ph. D. (Sci.)

Guided Students: Ph. D.: 05; Masters: 30

Total Research Publications: International 60; National 02
H-Index: 15, Citations: 846

Patents (Last five years):
International: 02 [PCT: Published: 02 (US: 01, EP: 01)]
National: Applied: 06

AWARDS Received

- Best Research Output of the Year 2017-18 given by SVKM's NMIMS (Deemed to be University), Mumbai (August 11, 2018)
- DST Foreign Travel Grant for presenting research work at Gordon Research Conference on Computer Aided Drug Design, West Dover, USA. (July 2017)
- Best Poster Award at International Conference on Pure and Applied Chemistry (ICPAC)-2016, Mauritius (July 2016)
- Indian National Science Academy (INSA) deputation under International Collaboration and Exchange Programme to University of Mauritius, Mauritius (2016)
- Best e-Presentation Award at the Virtual Conference on Computational Chemistry (VCCC)-2014 organized by University of Mauritius, Mauritius (August 1-31, 2014)
- Best Poster Award at International Conference on Pure and Applied Chemistry (ICPAC)-2014, Mauritius (June 2014)
- DST Foreign Travel Grant for presenting research work at Gordon Research Conference on Bioorganic Chemistry, Andover, USA. (June 2013)

Associated faculty

Department of Chemical Engineering

Name of Faculty: Ratnesh Dharamchandra Jain
Degree: PhD (Tech) [2009], M. Pharm [2005] B. Pharm [2003]
Designation: UGC Assistant Professor
Email: rd.jain@ictmumbai.edu.in
Phone: +91-22-3361-2029
Webpage: www.nano-medicine.co.in

Research Areas

Biopharmaceutical product development, Nanomedicine, 3D printing for pharmaceutical manufacturing

Research Students	Research Projects	Publications
Masters: 21 (04 ongoing)	Govt: 14 (02 ongoing)	International : 100
PhD: 10 (08 ongoing)	Private: 30 (02 ongoing)	National: NA
		Book chapter: 10
		Citations: 1694

Subjects Taught

UG: Biomaterials, Biopharmaceutical Engineering
PG: Research Methodology, Introduction to Biopharmaceutical Manufacturing

Awards/Honors

1. *BIRAC Bio-innovator Award*
2. *Ramalingaswami Fellowship, DBT*
3. *Ramanujan Fellowship, DST*
4. *DST Inspire Fellowship, DST*
5. *Alexanader von Humboldt Fellowship*
6. *Young Associate, Maharashtra Academy of Science*
7. *NR Kamath Book Award, ICT Mumbai*

Majors Publications and Patents

1. *Kalra N et al. Microfluidic Synthesis of a Reactive Mesh-Organic Framework for Glucose-Responsive Insulin Delivery. ACS Applied Materials & Interfaces. 2021*
2. *Patil S et al. Oral Delivery of Peptide Formulations and Their Cellular Evaluation. International Journal of Peptide Research and Therapeutics. 2021*
3. *Gupta K et al. A Stable CHO K1 Cell Line for Producing Recombinant Monoclonal Antibody Against SARS. Molecular Biotechnology. 2021*
4. *Gidwani D et al. Continuous production and separation of non-biocompatible pollutant nanoparticles using a droplet microreactor. Microfluidics and Nanofluidics. 2021*
5. *Gidwani et al. MICRODEVICE FOR NANOPARTICLE AND CHEMICAL SYNTHESIS. NDS (Granted Patent)*

Professional Activities

- *Convener, Biomedical Workshop: A skill development activity supported by national biopharma mission, BIRAC and SERB organized multiple times in a year*
- *Coordinator, DST-STUTI: DST supported Synergistic Training program Utilizing the Scientific and Technological Infrastructure' (STUTI) for science awareness and training program in Mumbai and Pune by DST FIST, DST PURSE supported equipment and facilities*
- *Innovation Ambassador, Innovation Cell, DoE, GoI*
- *Course Coordinator, M.Tech Bioprocess Technology (DBT)*

Research Group

Institute of Chemical Technology, Matunga, Mumbai-400019

Associated faculty

Dr. GUNJAN PRAKASH
B.Sc, M.Sc.(Plant Biosciences),
Ph.D. (Plant Biotechnology & Fermentation)
Associate Professor,
Centre for Energy Bioscience, ICT Mumbai
g.prakash@ictmumbai.edu.in

Research Students		Publications	Google scholar/Scopus	Patents
Ph.D.	Completed: 01 Ongoing: 02	Research Article: 27 Review Article: 01 National	Citation: 720 h-index: 13	Granted: 01
M.Tech	Completed: 12 Ongoing: 05	Publications: 02 Book chapter: 01	i-10 index: 14	Applied: 01

Projects Undertaken	Title
BBSRC, UK	Enhancing cobalamin (vitamin B12) bioavailability in culturally appropriate foods in India
BBSRC, UK	International partnership award to develop compartmentalization technology,University of Kent, UK
Godrej Agrovet Pvt. Ltd.	Mass cultivation of algae for aquafeed
Farmsow Pvt Ltd.	Development of Fish based algal products
Shaivaa AlgaTech	Heterotrophic Cultivation of Microalgae

RESEARCH ACTIVITIES:
Fermentation, Algal Biotechnology and Biofuels, Molecular Biology, Genetic Engineering

MAJOR ACHIEVEMENTS:
- Recipient of EMBO Travel Grant 2019
- Recipient of INDO-QUEENSLAND Early Career Fellowship by Department of Biotechnology, GOI Government of India
- Awarded BioVision Nxt. Fellowship by BioVision, the World Science Forum (held in Lyon, France for 27- 29th March 2011)
- Awarded TWAS (Third World Academy of Science) travel Grant for 2011 to participate in the international conference.
- Awarded CSIR-UGC NET for Research fellowship & Lectureship (2000)
- Graduate Aptitude Test in Engineering (GATE-2000) with 96.24 percentile AIR-54
- Gold Medal for securing Highest Score at Post Graduation Level in Banasthali Vidhyapith, Rajasthan (2000).

NCBI PUBLICATIONS (Genome/Sequences)
- Sp. chloroplast genome Accession MK995333
- Aurantiochytrium limacinum isolate ceb1 internal transcribed spacer 2, partial sequence Accession: MN046792.
- TPA_exp: Chlamydomonas reinhardtii strain CC-503 cw92 mt+ sedoheptulose-1,7-bisphosphatase (SBPase) mRNA, complete cds Accession: BK009918.1 GI: 1114439788

PROJECT + CONSULTATION

BBSRC bioscience for the future
Godrej agrovet
SHAIVAA
farmsow.

Research Group : Left to Right : Dr. Gunjan Prakash, Dr. Pratik Pawar, Nikhil Kadalag, Gandhali Phadnis, Rupali Morade.
Other students: Neha Kshirsagar, Anjali Meena, Priyanka

Key Achievements from Faculty

Prof. R. S. Singhal

- INSA Fellow 2022
- ICT-UAA Distinguished Fellow
- Ranked as the top 2% most-cited scientists (List published by Stanford University 2021)
- Fellow of Association of Food Scientist and Technologists, India
- Fellow (FIBA) of the International Bioprocessing Association-An International Forum on Industrial Bioprocesses Award May 2019
- Fellow of Biotech Research Society of India (BRSI)

Prof. U. S. Annapure

- President of Association of Food Scientist and Technologists, India
- Fellow of Maharashtra Academy of Sciences
- BOYSCAST Fellow

Prof. L. Ananthanarayan

- N. R. Kamath book author award for the book entitled "The Science and Technology of Chapati and other Indian Flatbread" CRC Press 2020

Dr. Snehasis Chakraborty

- Publon Global Peer Reviewe Award 2018
- DAAD Fellowship 2018

Prof. P. S. Kharkar

- Fellow of Maharashtra Academy of Sciences

Dr. Ratnesh Jain

- BIRAC Bioinnovator Award 2021

All FETD Faculty: Life Member, Association of Food Scientist and Technologists, India

Faculty Awards and Recognition

Faculty Name	Awards/Honors
Prof. Rekha S. Singhal	• INSA Fellow • ICT-UAA Distinguished Alumni • Editor, Carbohydrate Polymers, Elsevier, UK • Scientific panel member of FSSAI, New Delhi • Member of BIPP, BIG, SBIRI, SPARSH, BIRAC, and SAEN • CG Memorial award, FRI • Malviya Memorial award, BRSI
Prof. S. S. Lele	• Woman Achiever Award given by Akhil Bharatiya Chitpawan Mahasangha, 2017 • VASVIK Award 2017 • Industrial research Award for Women Scientists 2017 • Fellow of Indian Chemical Society 2020
Prof. Uday S. Annapure	• President of AFST (I), Mysore • Director, ICT Marathwada Campus, Jalna

Faculty Awards and Recognition

Faculty Name	Awards/Honors
Prof. Laxmi Ananthanarayan	• Won second prize in 'DuPont NutriScholars Awards' under the category of 'Most Nutritious Food Idea', in December 2017.
Dr. Shalini Arya	• TWAS Fellow
Dr. J. S. Gokhale	• Joint Secretary, AFSTI (Mumbai Chapter) 2021
Dr. Snehasis Chakraborty	• Recipient of Best PhD Thesis award across the country given by ICAR in June 2017. • Winner of Smart India Hackathon 2018 • Recipient of DAAD Fellowship under Re-invitation program in MAY 2018. • Recipient of Professor D.V. Rege–AFST Mumbai Chapter–2011 Endowment for Best Teacher Award 2018.
Professor P. S. Kharkar	• Independent Director, MinoniM Life Sciences, LLC, Delawar, US
Dr. Ratnesh Jain	• Advisor and Co-founder: Avay Biosciences, 3D Printing Startup • Founder: Wetranslate, Innovation Scale-up Advisory Startup

Faculty Expertise

Faculty Name	Expertise
Prof. Rekha S. Singhal (Head, FETD & Professor of Food Technology)	• Carbohydrate chemistry • Food Chemistry • Traditional Foods • Supercritical fluid extraction of biomolecules • Fermentative production & Downstream Processing of Biomolecules
Prof. S. S. Lele (Emeritus Professor)	• Fruits and vegetable processing • Biological effluent treatments • Nutraceuticals
Prof. Uday S. Annapure (Director, ICT Marathwada Campus, Jalna and Professor of Food Chemistry)	• Carbohydrate Chemistry & Technology • Cold Plasma Processing • Traditional Foods • Fermentative production & Downstream Processing of Biomolecules
Prof. Laxmi Ananthanarayan (Coordinator, Food Biotechnology and Professor of Biochemistry)	• Human nutrition • Food packaging • Enzymes in the Food Industry

Faculty Expertise

Faculty Name	Expertise
Dr. Shalini Arya (Assistant Professor)	• Traditional foods • Product development and processing of Cereals and legumes
Dr. Jyoti Sontakke-Gokhale (UGC Assistant Professor)	• Nutraceuticals and functional foods • Bio-catalysis • Waste management • Fermentative production & Downstream Processing of Biomolecules
Dr. Snehasis Chakraborty (Assistant Professor)	• Food Process Engineering • Kinetics modeling • Sensory analysis • Process optimization and Product development
Professor P. S. Kharkar	• Design and development of new chemical entities • Nutraceuticals
Dr. Gunjan Prakash	• Algal biotechnology • Fermentation
Dr. Ratnesh Jain	• Biopharmaceutical product development

Faculty Publications

Faculty	Total No. of Publications	Publications in Last Five years	Total Citations	Citations in Last Five Year	h-index (Scopus)
Prof. Rekha Singhal	400	92	21801	1039	53
Prof. Smita Lele	108	34	4867	326	28
Prof. Uday Annapure	98	38	1768	1408	22
Dr. Laxmi Ananthanarayan	69	42	3756	345	21
Dr. Shalini Arya	151	69	1886	1589	18
Dr. Snehasis Chakraborty	43	28	815	712	15
Dr. Jyoti Gokhale	12	07	123	70	06
TOTAL	879	300	35016	**5489**	163

Patents
Granted: 1
Applied: 2

67 different journals

Research Grant : Department Level

No.	Faculty	Project Name	Funding Body	Grant (in lakh)	Duration
1	Cordinator: Prof. R. S. Singhal	UGC-CAS II	UGC	₹ 206	2018-23
2	Cordinator: Prof. U. S. Annapure	FIST Grant	DST	₹ 98	2018-23
3	Cordinator: Prof. L. Ananthanarayan	MTech Food Biotechnology	DBT	₹ 36.65 ₹ 42.66 ₹ 33.8 ₹ 73.70	2017-18 2018-19 2020-21 2021-22
			Total =	₹490.81 lakhs	

Research Grant Received

AY 2021-22

Faculty	Project Title	Duration	Funding Agency	Amount (in lakhs of ₹)
Prof. U. S. Annapure (PI) & Dr. J. S. Gokhale (CO-PI)	Integrated approach for Utilization of Mango Processing waste	2021-2024	RGSTC	67.54
Prof. R. S. Singhal (PI) & Dr. J. S. Gokhale (CO-PI)	Resolving gaps in Scaling up Millet Value chain	2021-2023	MOFPI	8.15
			Total	**75.69**

Research Grant Received

AY 2020-21

S. No.	Faculty	Project Title	Duration	Funding Agency	Amount (in lakhs of ₹)
1	Prof. U. S. Annapure	On-site Multi-ion monitoring system for on-line nutrient-laden water control in vertical hydroponic systems	2021-2023	Indo-Germann Science & Technology Centre	192.027
2	Dr. S. Chakraborty	Optimizing the fermentative production of dextran	2021-2024	CSIR	16.14
3	Prof. U. S. Annapure	PURSE Program	2021-25	DST	2400
				Total	**2608.167**

Research Grant Received

AY 2018-19

S. No.	Faculty	Project Title	Duration	Funding Agency	Amount (in lakhs of ₹)
1	Prof. S. S. Lele (PI) & Dr. J. S. Gokhale (CO-PI)	Techno-commercial viability studies for small scale fruit winery	2018-20	RGSTC	31.76
2	Dr. S. S. Arya	Novel, non-thermal, energy efficient, industrially scalable hydrodynamic cavitation processing of fruit juices	2018-20	MoFPI	44.09
3	Dr. S. S. Arya	Novel, non-thermal, energy efficient, industrially scalable hydrodynamic cavitation (HC) processing of milk for enhanced nutrients and shelf life extension	2018-21	DST-SERB	43.06
4	Dr. S. S. Arya	Novel, green, cloud point extraction of bioactive from fruit industry waste.	2018-20	TEQIP-III	6.57
5	Dr. S. Chakraborty	Integrated processing of beverages Integrated processing of beverages from minor tropical fruits	2018-21	MoFPI	36.46
				Total	**161.94**

Research Grant Received

AY 2017-18

S. No.	Faculty	Project Title	Duration	Funding Agency	Amount (lakhs of ₹)
1	Prof. U. S. Annapure	Studies in sterilization of spices using non-thermal processes	2017-2019	DST	24.48
				Total	**24.48**

Industry Sponsored Projects

AY 2021-22

S. No.	Faculty	Project Title	Duration	Funding Agency	Amount (lakhs of ₹)
1	Dr. J. S. Gokhale	Value added products from seaweed & its applications	2021-2024	Pragati Biotech	16.08
				Total	**16.08**

AY 2020-21

S. No	Faculty	Project Title	Duration	Funding Agency	Amount (lakhs of ₹)
1	Dr. J. S. Gokhale (PI) & Dr. S. Chakraborty (CO-PI)	Development of plant based milk product	2020-2021	Vegannovative Solution Pvt. Ltd. Bengaluru	6.43
2	Dr. J. S. Gokhale	Characterization and application of extracted proteins	2020-2021	Praj Industries Pvt. Ltd.	5.31
3	Prof. U. S. Annapure	Plant and Mushroom based products	2020-2021	Zuari Foods & Farms Ltd.	04
4	Prof. U. S. Annapure	Identifying and Evaluating various natural non-nutritive sweeteners in food industry	2021-2024	Orcharnd Brands	28
				Total	**43.74**

Industry Sponsored Projects

AY 2019-20

S. No	Faculty	Project Title	Duration	Funding Agency	Amount (in lakhs of ₹)
1	Prof. U. S. Annapure	Development of ready to eat custard	2019-2020	Vita Nutrics Foods and Feeds Pvt Ltd.	6.05
2	Dr. S. Chakraborty	Development of plant based egg alternative	2019-2020	Shivanika Foods Pvt. Ltd.	3.87
				Total	**9.92**

Industry Sponsored Projects

AY 2018-19

S. No.	Faculty Name	Project Title	Duration	Funding Agency	Amount (lakhs of ₹)
1	Prof. U. S. Annapure	Study of effect of incorporation of dietary fiber (Kber-100, Kber-HRF, INF-C) on protein bar, pasta, and pizza bases and its quality improvement	Oct 2019	Aditya Birla S&T Pvt. Ltd.	3.98
2	Prof. U. S. Annapure	Application of dilatory fibers in bakery products	July 2019	Aditya Birla S&T Pvt. Ltd.	4.28
3	Prof. U. S. S.Annapure	Probiotic study on K-ber 100 dietary fiber using selected probiotic strains	July 2019	Aditya Birla S&T Pvt. Ltd.	7.25
4	Prof. U.S. Annapure	Utilization of mango waste for byproducts development	June 2019	Exotic foods Pvt. Ltd.	6.93
5	Prof. U. S. Annapure	Performance evaluation of natural green color and natural antioxidants in food products	May 2018	Kancor Ingredients Ltd.	5.88
6	Prof. R. S. Singhal	Optimization of process parameters for Astaxanthin extraction using supercritical CO2	Aug 2018	Reliance Industries Ltd.	8.78
7	Prof. U. S. Annapure	Application of dietary fibers in bakery products	Aug 2018	Aditya Birla S&T Pvt. Ltd.	4.93
				Total	**42.03**

Number of Students in UG & PG

M.Tech Food Biotechnology

Year of Study	(2020-21)	(2019-20)	(2018-19)
	Sanction Intake	Sanction Intake	Sanction Intake
1st Year	10	10	10
2nd Year	10	10	10
Total	20	20	20

M.Tech Food Engineering and Technology

Year of Study	(2020-21)	(2019-20)	(2018-19)
	Sanction Intake	Sanction Intake	Sanction Intake
1st Year	18	18	18
2nd Year	18	18	10
Total	36	36	28

Bachelor of Technology in Food Engineering and Technology

Year of Study	CAY (2020-21)		CAYm1 (2019-20)		CAYm2 (2018-19)	
	Sanction Intake	Lateral entry	Sanction Intake	Lateral entry	Sanction Intake	Lateral entry
2nd Year	16	0	16	0	16	0
3rd Year	16	0	16	0	16	0
4th Year	16	0	16	0	16	0
Sub-Total	48	0	48	0	48	0
Total	48		48		48	

Total Data for All PG Program

Year of Study	2020-21	2019-20	2018-19
	Sanction Intake	Sanction Intake	Sanction Intake
1st Year	28	28	28
2nd Year	28	28	20

Student Faculty Ratio

Description	2020-21	2019-20	2018-19
Total No. of Students in the Department(S)	104	96	88
	Sum total of all (UG + PG) students	Sum total of all (UG + PG) students	Sum total of all (UG + PG) students
No. of Faculty in the Department(F)	21	19	20
	F1	F2	F3
Student Faculty Ratio (SFR)*	11.06	9.82	9.00
	SFR1= S1/F1	SFR2 = S2/F2	SFR3 = S3/F3
Average SFR	9.96		
	SFR = (SFR1+SFR2+SFR3)/3		
F=Total Number of Faculty Members in the Department (excluding first year faculty)			

Criteria 5: Laboratories and Research Facilities

Infrastructure & Technical Support

- All the faculties have their individual cabins.
- All classrooms are equipped with white/black board, computer, internet, projectors and biometric attendance system
- All the computers in the department are equipped with relevant software and internet facility
- Involvement in regular laboratory workshops for the faculties
- 2 Lab Assistants, 1 Lab Technician and 4 Lab Attendants to help
- Two students perform one experiment in one lab session of 4 hours
- During pandemic, Internet speed increased from 50 mbps to 100 mbps
- G suit and zoom licenses for all departments
- Off campus online access for library

Facilities Available

- Extruders
- Tray and IR dryer
- Fluidized bed dryer
- Fermenter
- High pressure homogenizer
- Ultrasonic processor
- Pulsed Light System
- Spray dryer
- HPLC, HPTLC, SCFE
- GC, GCMS
- Texture Analyzer
- Electrophoresis unit
- Protein purification
- Ultrafiltration
- Microwave extractor
- RT-PCR
- Viscometers
- Colorimeter
- CAP/MAP
- Retort Processing
- Differential Scanning calorimetry
- Plasma Processing

Support Staff

Sr. No.	Name	Designation	Qualification
1	Mrs. S. S. Jadhav	Lab Technician	B.Sc. (Chemistry)
2	Mrs. C. B. Koli	Lab Assistant	B.Sc. (Physics)
3	Ms. S. R. Dhakne	Lab Assistant	B.Sc. (Chemistry)
4	Mrs. Pramila Pawar	Lab Attendant	Non matric
5	Mr. Santosh Rajam	Lab Attendant	10th Standard
6	Mr. Ganesh Bhagat	Lab Attendant	Non matric
7	Mr. Rupesh Alim	Lab Attendant	12th Standard

Departmental Laboratories

Sr. No	Lab No	Name	Utilization
1	A-209	Extruder Room	UG, PG, Ph.D.
2	A-208	Instrumentation Lab	UG, PG, Ph.D.
3	A-211	FETD Lab	UG, PG, Ph.D.
4	A-212	Autoclave room	UG, PG, Ph.D.
5	A-213	Lab-A213	UG, PG, Ph.D.
6	A-214	Mol. Bio Lab	UG, PG, Ph.D.
7	A-215	Fermentation Lab	UG, PG, Ph.D.
8	A-216	Laminar Room	UG, PG, Ph.D.
9	A-217	Prof. DV Rege Lab	UG, PG, Ph.D.
10	A-218	FETD Lab	UG, PG, Ph.D.
11	A-237	PTC Lab	UG, PG, Ph.D.
12	A-238	FBT Lab	UG, PG, Ph.D.
13	A-283	Lab 283	UG, PG, Ph.D.
14	A-285	Super Critical Extraction Room	UG, PG, Ph.D.
15	A-289	Processing Lab	UG, PG, Ph.D.
16	A-241	Technical Analysis Lab	UG, PG, Ph.D.
17	-	Lalwani Center Food Biotechnology UG Lab	UG, PG, Ph.D.

Facilities

DVR-CAFT Lab

Food Processing Lab

Continuous Microwave Pasteurizer

Twin Screw Extruder

Atmospheric Plasma

Pulsed Light Treatment

Rheometer

Texture analyzer

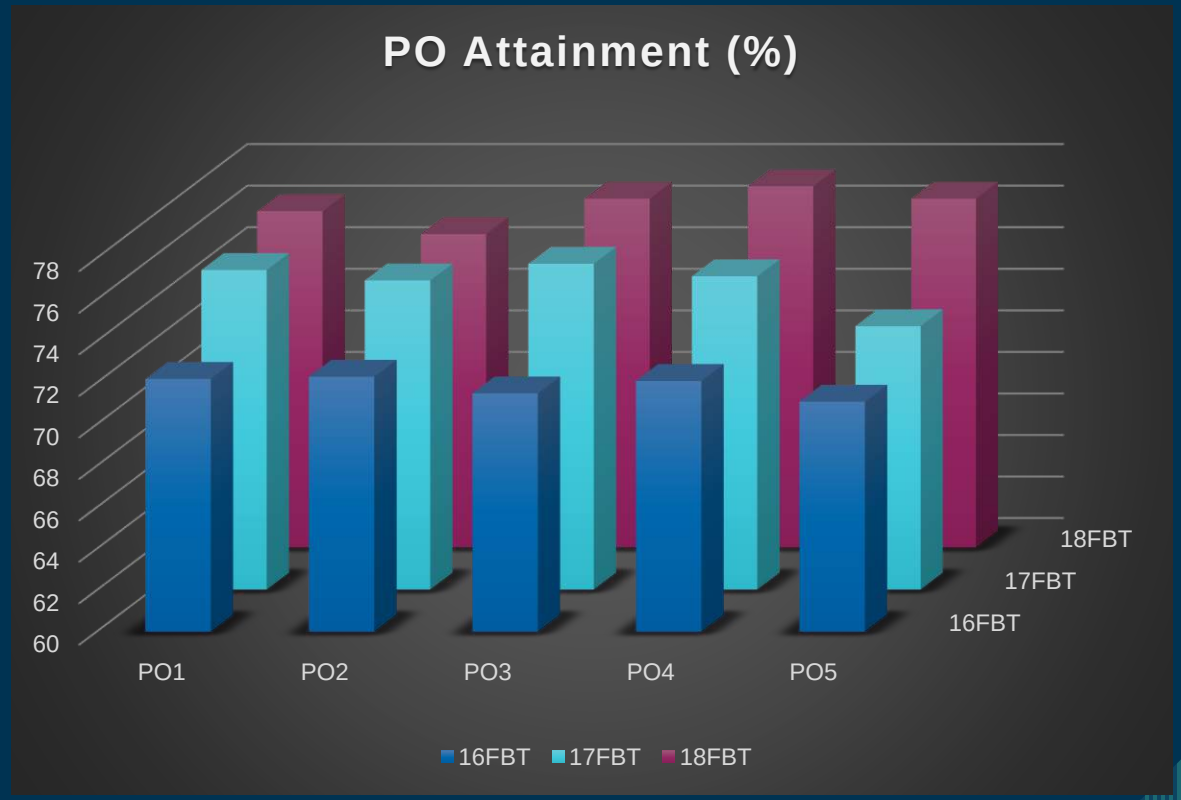
GCMS

HPLC

Criteria 6: Continuous Improvements

Improvement in PO Attainment

% Overall PO Attainment					
Batch	PO1	PO2	PO3	PO4	PO5
16FBT	72.2	72.3	71.5	72.1	71.1
17FBT	75.4	74.9	75.7	75.1	72.7
18FBT	76.2	75.1	76.8	77.4	76.8



Improvement in Quality of Projects

- The number of students scoring more than average is also increased in following year.

Graduating Batch	Average Thesis Score (%)	No of Students scored ≥ average	Attainment given out of 3
2016-18	80.6	4	3
2017-19	81.5	4	2

- The thesis is thoroughly checked by two examiners (internal & external) and it is being plagiarism checked prior to submission.
- The process optimization, modelling, design and engineering component is increasing in the project gradually
- The project component has been divided to Semester I, II, III and IV. Semester IV is entirely devoted to research. It is expected that the quality of project is going to improve in next year.
- Semester III and IV are entirely devoted to research.

Rubrics for Evaluation of Project

Details	Max. Marks	Internal Examiner	External Examiner
Understanding of Research Area	60		
Problem formulation/Experimental design/Mathematical Modelling	60		
Quality of Work done	70		
Analysis and Interpretation of Results	70		
Quality of Thesis Submitted	70		
Quality of Presentation	60		
Answer to Question raised during Open Defence	60		
Total	450		

Recommendation

The MTech thesis submitted by candidate is:

- Acceptable, may be regarded as final in present form.
- Acceptable, but with minor revisions.

Rubrics for Research I & II

Research I

Details	Max. Marks	Internal Examiner	External Examiner
Literature survey of proposed research project	20		
Objectives	10		
Methodology and plan of work	10		
Preliminary experimental work	10		
Expected outcome	10		
Presentation and defence	20		
Report (25 to 30 pages)	20		
Total	100		

Research II

Details	Max. Marks	Internal Examiner	External Examiner
Literature survey of proposed research project	20		
Objectives	10		
Methodology and experimental work	60		
Interpretation of data	10		
Future plan of work	10		
Presentation and defence	20		
Report (25 to 30 pages)	20		
Total	150		

Rubrics for Seminar & CRRP

Details	Max. Marks	Internal Examiner	External Examiner
Seminar oral and electronic presentation quality	10		
Seminar technical content and understanding	10		
CRRP critical review quality and points covered	10		
Seminar + CRRP report (only Guide)	20		
Total	50		

Placement Scenario

Item	Graduating in AY		
	2019-20	2018-19	2017-18
The total no. of students admitted in first year (N)	10	10	10
No. of students placed in companies or Government Sector (X)	7	6	7
No. of students pursuing Ph.D. / JRF/ SRF(y)	1	2	2
No. of students turned entrepreneur in engineering/technology (Z)	0	1	1
Placement Index: (x + y + z) /N	0.8	0.9	1
Average placement= (P1 + P2 + P3)/3	0.866		
Assessment Points = 20 × average placement	0.866 x 20 = 17.33		

Quality of Students Admitted

GATE Score	2021-22	2020-21	2019-20	2019-18
Highest Score	175	171.5	53	56
Minimum Score	60.5	109	40	37.75

- All the students in last five academic years of this program are JNUCEEB/ GAT-B qualified and they receive fellowship and contingency sponsored by DBT
- From the above Table, it is clear that the quality of students admitted increased in last year. The Highest marks in GATB score is increasing in last two years.

Improvement in Student Publications

1. Shraddha Srinivasan, Kriti Kumari Dubey and Rekha S. Singhal. (2019). Influence of food commodities on hangover based on alcohol dehydrogenase and aldehyde dehydrogenase activities. Current Research in Food Science, 1, 8-16.
2. Garg, D., Chakraborty, S., & Gokhale, J. S. (2020). Optimizing the extraction of protein from *Prosopis cineraria* seeds using response surface methodology and characterization of seed protein concentrate. LWT, 117, 108630.
3. S. Rout, R. S. Soumya and U. S. Annapure (2021) Clean meat: techniques for meat production and its upcoming challenges. Animal Biotechnology, 13, 3041-3058.
4. Chakraborty, S., Shaik, L., & Gokhale, J. S. (2021). Subcritical Water: An Innovative Processing Technology.
5. Logesh V N and J. S. Gokhale. (2022) Rheological, techno-functional, and physicochemical characterization of *Prosopis cineraria* (Sangri) seed gum: A potential food and pharmaceutical excipient. Accepted to Journal of Food Processing & Preservation.
6. Lakshmi J., S. Kazi and J. S. Gokhale (2022) Microfluidics for detection of food pathogens: Recent trends and opportunities, Food Research International (Under review).
7. Seshadrinathan S. and Chakraborty S. (2022) Fermentative Production of Erythritol from Molasses using Optimization, Partial Purification and Characterization. Food Technology and Biotechnology (Under review).
8. Logesh V N, D. Venketachalam and J. S. Gokhale (2022) Plant-Based Meat Alternatives: Sustainability, Sourcing, Processing, Nutritional and Organoleptic implications. Food Bioscience (Under review)

Improvement in Laboratories

- ✓Prof. DV Rege Centre for Advanced Food Technology is sponsored by HIMEDIA Lab, India (58 lakhs)
- ✓Food Analysis lab and PTC Research lab has been renovated by Goodwill Industries Ltd., India (13 lakhs)
- ✓Fermentation lab and Conference room is sponsored by Fine Organics Ltd., India (53 lakhs)
- ✓Food Processing lab is sponsored by Dr. Shrikhande (10000 USD)
- ✓Research lab 283 is sponsored by Morde Foods (48 lakhs)





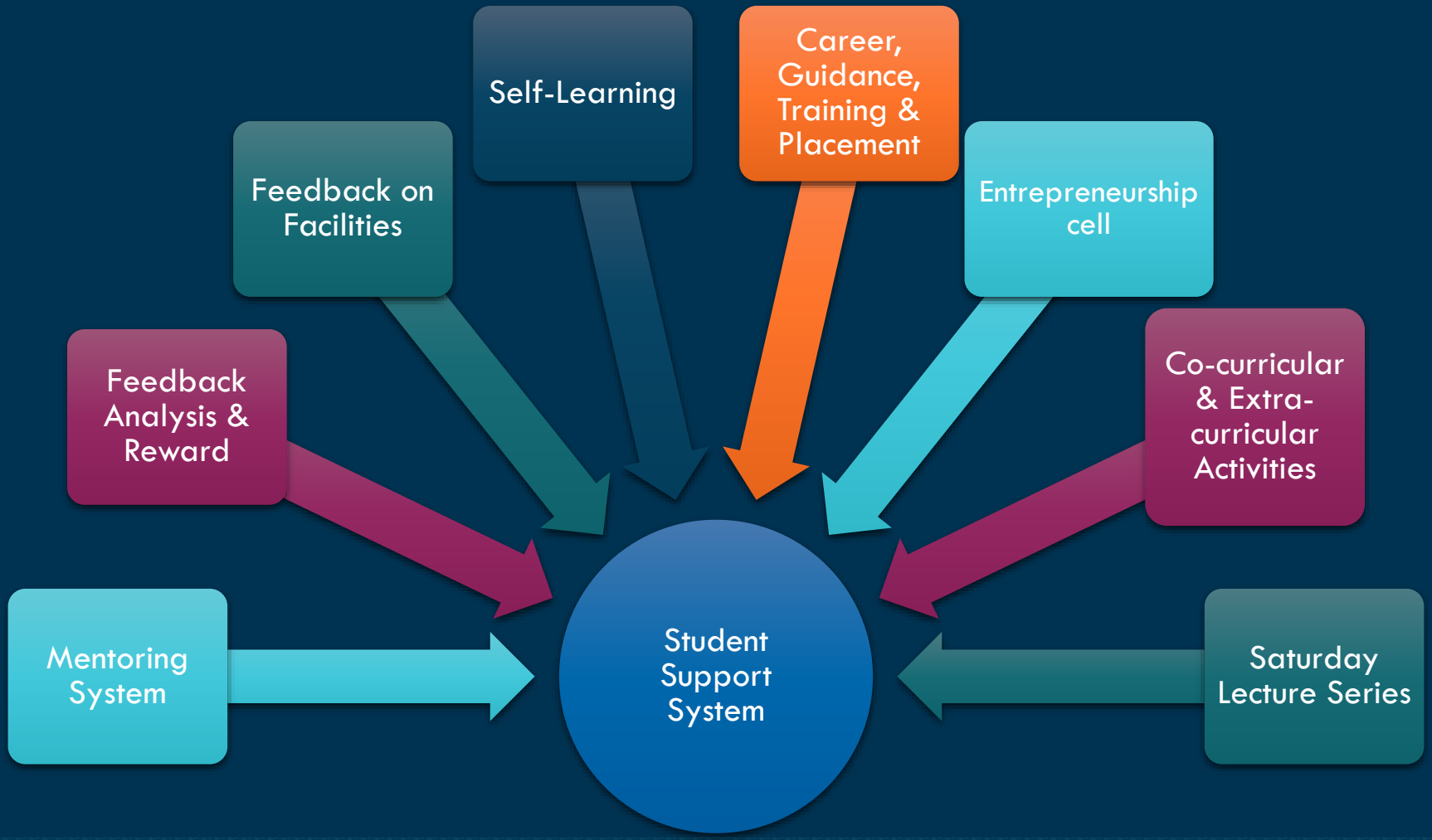

Saturday Lecture Series

No	Name of speaker	Topic	Date
1	Dr. N. Ramasubramanian	Job opportunities and challenges in food and allied industries	03 April 2021
2	Dr. Sagar Gokhale	New Product Development: An Industry Perspective	10 April 2021
3	Dr. Malathy Venkatesan	Are you and the industry ready for one another?	17 April 2021
4	Dr. Rupesh Tupe	Entrepreneurial skills for start-up and food marketing in digital space	24 April 2021
5	Mr. Sahil Desai	How to be corporate ready: A perspective	08 May 2021
6	Dr. Parag Saudagar	Journey of A Biotech Startup	15 May 2021
7	Dr. Ganesh Ramchandran	Increase your employability quotient- a blueprint for entering and succeeding in corporate life after M. Tech	22 May 2021
8	Dr. Preeti Shrinivas,	"Campus to Corporate	29 May 2021
9	Mr. Bishal Prasher	Taking control of the flow - Learnings from 2 years of M. Tech. FBT and beyond	05 June 2021
10	Dr. Pavitra Krishna Kumar	ICT and Beyond: My experiences as a food scientist	12 June 2021

Program Specific Budget

Items	Rs. In Lakhs					
	Budgeted in 2018-19	Actual Exp. 2018-19	Budgeted in 2019-20	Actual Exp. 2019-20	Budgeted in 2020-21	Actual Exp. 2020-21
Infrastructure Built-up	38.52	36.54	49.03	55.32	36.71	9.02
Library	4.34	3.95	5.30	6.49	4.31	0.82
Laboratory Equipment	55.39	52.59	70.56	38.33	25.43	7.68
Laboratory Consumables	6.01	5.92	7.94	9.57	6.35	2.88
Teaching & Non-teaching staff salary	50.99	47.62	63.90	72.28	47.96	49.13
Maintenance & spares	2.39	2.19	2.94	2.54	1.69	1.65
R & D	9.47	9.43	12.66	1.97	1.31	2.42
Training and Travel	6.93	6.86	9.20	4.13	2.74	1.68
Miscellaneous expenses	1.55	1.41	1.89	3.64	2.42	1.61
Other (Consultancy, Building, Recurring etc)	38.16	37.04	49.69	36.80	24.41	19.90
TOTAL	**213.76**	**203.55**	**273.11**	**23.08**	**153.32**	**96.81**

Student Support System



Vision: Five Years down the Line...

- To increase the intake of students in the program
- To develop entrepreneurship skills in the students
- To sensitize students towards environmental concerns and seek sustainable solutions


INSTITUTE OF CHEMICAL TECHNOLOGY
रसायन तंत्रज्ञान संस्था
कर्मण्येवाधिकारस्ते


Thank you

Visiting Endowments & MoU

Visiting Endowments

- Prof. A. Sreenivasan Felicitation Lectureship
- Prof. J. V. Bhat Memorial Lecture
- Prof. B. D. Tilak Fellowship Lecture
- Marico Industries Visiting Fellowship Lecture
- Lupin Visiting Fellowship Lecture
- Golden Jubilee Visiting Lecture

MoU with Industry and Universities

- Washington State University
- Tata Chemicals
- Hindustan Unilever
- Trilok Food India
- Praj Industries Pune

Social Activity

08 CITY

Siddhivinayak takes on malnutrition

The trust will pay for the fortification of special laddoos with iron, zinc, vitamins, which will be given to anganwadis

Continued from page 01

THREE well-known names from premier institutions — Dr Abha Jadhav, paediatric professor, Sion Hospital, Prof NG Shah from IIT's Centre for Technology Alternatives for Rural Areas, and Prof Uday Anupure, Head, Department of Food Engineering and Technology, Institute of Chemical Technology (ICT) — have started work on making the fortified laddoos, which will have the same shelf life and taste of the regular Siddhivinayak laddoos.

"As per our understanding, the plan is to supply these laddoos to the anganwadis in malnourished areas," said Prof Anupure. "ICT's role will be to provide technical support and help with scientific product development. People generally don't have the tendency to say no to anything associated in the name of god and prasad. So we are positive about this."

Pilot in Palghar

Vinita Vaid Singal, Secretary, Women and Child Development (WCD), said the Siddhivinayak trust board have been endorsed the concept.

"An MoU with the Siddhivinayak trust will be signed soon," said Singal. "We will start the pilot project in Palghar [covering the tribal areas of Vikramgad, Mokhada and Jawhar]. We want to start this program at the earliest," Aadesh Bandekar, chairman, Siddhivinayak trust, said the kitchen work is underway and machines are being procured. "Experts from IIT-B, Sion Hospital and ICT are working on the program," he said.

Senior WCD department officials said that of the 37 lakh children screened in the six months to 6 years age group, 20,393 fall under the Severe Acute Malnutrition (SAM) category and 13,927 were in the Moderate Acute Malnutrition (MAM) category.

A malnourished child with his mother in Jawhar. PHOTOS

Nashik, with 4,034 children, had the highest SAM incidences, while Nandurbar had 2,469. Nashik topped the charts in MAM cases also, with 10,376 children, followed by Aurangabad with 3,407. Palghar, where the pilot project will be started, had 2,663 SAM cases. mid-day had reported on August 3, 2015, that 910 kids were starving in Jawhar and Mokhada, highlighting the plight of malnourished children in Palghar.

"We are hoping that even if children are given two laddoos daily or say three times a week at the anganwadi, it should bring down malnourishment by around 20 per cent in the first few months. The special laddoos will be distributed through anganwadis run by Integrated Child Development Services (ICDS) in Palghar, and will later be expanded," said an official, adding that the laddoos will be fortified with five to seven micronutrients like Iron, Zinc, Vitamin A, Folic acids, etc.

Indira Malav, Commissioner, ICDS, said, "We are yet to be apprised about the laddoo initiative, but it sounds interesting. We are celebrating Nutrition Month [September] and have introduced a concept called 'Adopt Life' for the first 1,000 days from when a child is born, which is a period in which they are vulnerable and at risk of infant mortality. We have roped in all departments concerned across the state to make the program a success. Through our Village Child Development Centers (VCDC), we are able to monitor malnutrition cases and diagnose them at an early stage."

Automated laddoo centre

Siddhivinayak temple sources said a fully automated laddoo-making unit will replace the existing kitchen. "The civil work for the fully automated centre for making the prasad laddoos is at its completion stage," said a source.

Devotees will continue to get the normal laddoos, which cost ₹20 for two. The malnutrition packs will be given in colour. Other details will be finalised once the MoU is signed. The procurement order for the laddoo-making machine is done, and it will be in place soon. "We want to minimise the human interface in making of the laddoos," said a temple official. "Presently, around 40,000 laddoos of 50g each are made daily and it usually gets over the same day."

The automated unit will help increase these numbers. Fraud for devotees will continue to be the same, and additional laddoos will be made for the tribal children project.

1 in 4
children are stunted due to malnutrition globally

2.6MN
No. of children killed due to malnutrition globally, one-third of all deaths

TWO
If a child becomes malnourished before this age, damage can be irreparable

550 kids starving in Jawhar, Mokhada

mid-day had highlighted the chronic issue in 2015

How is malnutrition measured?

The severity of malnutrition is measured by weight-to-age ratio (underweight), or weight-to-height ratio (wasting), or weight-to-age ratio (stunting).
Mid-upper arm circumference is used to measure the extent of wasting in children between six months and 5 years. Head circumference is used to measure if brain growth is normal in the first few years after birth. For adolescents and adults, BMI (weight-to-height) is used.

Supplementary Nutrition Program

Under the SNP programme, ICDS ensures that all anganwadi serve morning snacks and hot cooked meals to children in the age group of three to six years. Each child gets 500 kilo-calories and 12 to 15 grams of protein. Snacks include khamana (rice), shevda, dal, and groundnuts four days a week and murmura-jaggery laddoo twice a week.
A hot cooked meal consists of dal and twice a week, khichdi twice a week and sweet lassi thrice a week.
There are 553 ICDS projects in Maharashtra; 364 in rural areas, 85 in tribal areas and 104 in urban slums. Of the state's 1.3 crore children in the 0-6 age group, 88 lakh are covered by ICDS via 88,272 anganwadis.

mid-day

SIDDHIVINAYAK TO MAKE SPL LADDOOS TO BATTLE MALNUTRITION

EXCLUSIVE » The laddoos, which will be served free to Palghar kids soon, will be fortified with essential nutrients

VINOD KUMAR MENON

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Departmental Budget

Items	Rs. In Lakhs					
	Budgeted in 2018-19	Actual Exp. 2018-19	Budgeted in 2019-20	Actual Exp. 2019-20	Budgeted in 2020-21	Actual Exp. 2020-21
Infrastructure Built-up	173.34	164.43	158.39	178.73	183.53	45.12
Library	19.53	17.79	17.14	20.98	21.55	4.12
Laboratory Equipment	249.26	26.65	227.97	123.83	127.15	38.42
Laboratory Consumables	27.07	26.65	25.67	30.93	31.76	14.40
Teaching & Non-teaching staff salary	229.47	214.31	206.44	233.53	239.80	245.67
Maintenance & spares	10.74	9.85	9.49	8.21	8.43	8.26
R & D	42.61	42.45	40.90	6.37	6.54	12.10
Training and Travel	31.20	30.85	29.72	13.34	13.70	8.39
Miscellaneous expenses	6.96	6.35	6.11	11.77	12.03	8.03
Other (Consultancy, Building, Recurring etc)	171.73	166.67	160.55	118.88	122.07	99.52
TOTAL	**961.91**	**915.99**	**882.37**	**746.58**	**766.61**	**484.03**

Electives Offered by the Department

No.	Course Code	Subjects	Credit	Hours/ Week	Marks
1	FDT 2026	Experimental Design and Optimization in Food Processing	3	(2L+1T)	50
2	FDT 2025	Food Process and Equipment Design	3	(2L+1T)	50
3	FDT 2024	Separation Techniques in Food Industry	3	(2L+1T)	50
4	FDT 2002	Food Safety and toxicology	3	(2L+1T)	50