

# College of Food Processing Technology and Bio Energy

*Excel in an enterprising and innovative learning culture*



## *INFORMATION BROCHURE*



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### **Compiled by :**

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The manufacturing and supplying of food products of consistent quality and nutritional value at affordable cost is essential to the success of the food industry today. The efficient use of resources is the growing concern for all involved in food production, processing, distribution and retailing. The food industries in the country need modernization to face the challenges of the globalization especially with respect to the economic production of superior quality products. This necessitates special attention towards availability of qualified technical manpower, effective technologies and efficient machinery.

Considering the huge demand of the specialized human resource for the fast growing sectors of food industry, the Anand Agricultural University has established a full-fledged College of Food Processing Technology & Bio-Energy at Anand in the year of 2008-09 vide Government of Gujarat, Department of Agriculture & Cooperation Notification No -ACV- 122008 - 404 - C.2 dated 29-05-2008.

The college undertakes the trinity function of education, research and extension in the area of food processing technology and bio energy. College operates with the vision, mission and goal as stated below.

**Vision**

Providing excellent food processing professionals to the industry.

**Mission**

The primary mission of the college is to produce highly skilled, competent and motivated technical manpower for food processing and allied industries. The technocrats so produced will also be competent to handle all the aspects of Government Departments, research institutes, quality testing laboratories and other related agencies. Also, the college is concerned with the exploitation of novel techniques and technologies to maximize the use of food resources.

**Goal**

The goal of the college is to promote the integration of **teaching, research** and **extension** in the area of food processing and bio energy by serving as a premier educational and research institute in the State of Gujarat and in India.



# Academic Programmes

College offers under-graduate and post-graduate academic program leading to the degrees of B. Tech, M. Tech & Ph. D. in the discipline of Food Technology.

	Programmes	Duration	Current Intake capacity*
UG	B. Tech (Food Technology)	8 Semester	65
PG	M. Tech (Food Technology) <i>(For 2023-24)</i>	4 Semester	7
	Food Processing Technology (FPT)		
	Food Process Engineering (FPE)		
	Food Safety and Quality Assurance (FSQA)		
	Ph. D (Food Technology) <i>(For 2023-24)</i>	6 Semester	3
	Food Processing Technology (FPT)		
	Food Process Engineering (FPE)		
	Food Safety and Quality Assurance (FSQA)		

\* may vary from year to year

**Admission Procedure**

**For B.Tech. (Food Technology)**

The candidates to be eligible for admission should have passed the Higher Secondary School Certificate (HSSC) examination or its equivalent in science stream with Physics, Chemistry, Mathematics/Biology and English as compulsory subjects from any recognized Board/ University in Gujarat or examinations recognized as equivalent thereto. The minimum requirements of marks shall be as prescribed in the university prospectus. The merit is prepared based on marks obtained in GUJCET of the respective year and HSSC examinations or as prescribed from time to time.

**For M.Tech. (Food Technology)**

- A candidate for admission to the master degree programme in Food Process Technology and Food Safety & Quality, should possess a four years B.Tech degree in Food Technology/ Food Processing Technology/Dairy Technology/ Food Processing Technology from State Agricultural University/Kamdhenu University of Gujarat with O.G.P..A. of not less than 6.00 (10.00 basis) or its equivalent in aggregate.
- A candidate for admission to the master degree programme in Food Process Engineering, should possess a four year B.Tech. in Agriculture Engineering/Food Technology/Food Processing Technology/Dairy Technology from State Agricultural University/Kamdhenu University of Gujarat with O.G.P..A. of not less than 6.00 (10.00 basis) or its equivalent in aggregate.

The merit is prepared based on the score obtained in the entrance examination conducted for this purpose and the qualifying degree examination or as prescribed from time to time.

**For Ph.D. (Food Technology)**

A candidate for admission to the doctoral degree programme should possess a B.Tech & M.Tech degree with specification in Food Technology/ Food Processing Technology/ Food Engineering/ Post Harvest Technology / Agricultural Process and Food Engineering and equivalent with an O.G.P.A. of not less than 6.75 (10.00 basis) or its equivalent in aggregate. The merit is prepared based on the score obtained in the entrance examination conducted for this purpose and the qualifying degree examination or as prescribed from time to time.

Reservation of seats is as per the university rules in force from time to time. A few seats in B Tech, M Tech and Ph D are also filled through All India examination being conducted by ICAR, GoI, New Delhi.

**How to apply:**

Application form-cum-prospectus can be downloaded from the university website (<http://www.aau.in>) or from [www.gsauca.aau.in](http://www.gsauca.aau.in)





To oversee the academic and other activities, the college is divided in to five departments. Well qualified and experienced engineers, technologists and scientists are the core faculty of the college. There are visiting faculty available from industry and other institutes. The faculty and staff available for teaching and research at present are:

## Principal & Dean (I/c.) Dr. Samit Dutta, Ph.D.

### Department of Food Process Engineering

V. B. Bhalodiya, Ph.D., Associate Professor & Head  
S. S. Kapadi, Ph.D., Professor  
K. V. Vala, Ph.D., Assistant Professor  
N. V. Shah, M.E., Assistant Professor  
A. Nema, Ph.D., Assistant Professor  
M. A. Makwana, Ph.D., Assistant Professor  
A. N. Nakiya, M. Tech., Assistant Professor  
T. H. Bhatt, M. E., Assistant Professor  
J. P. Rathod, Sr. Research Assistant  
S. V. Andani, Ph.D., Sr. Research Assistant  
R. M. Barot, Craft Teacher

### Department of Food Safety & Quality Assurance

B. H. Joshi, Ph.D., Associate Professor & Head  
H. G. Bhatt, Ph.D., Associate Professor  
D. H. Patel, Ph.D., Assistant Professor  
K. Damle, M.Sc., Assistant Professor  
J. K. Momin, Ph.D., Assistant Professor  
R. Dhingani, M.Sc., Assistant Professor  
A. M. Patel, Ph.D., Assistant Professor  
N. P. Runajkar, Laboratory Technician  
N. Jariwala, Laboratory Technician

### Department of Food Business Management

S. Dutta, Ph.D., Associate Professor & Head  
P. S. Parsania, Ph.D., Assistant Professor  
N. Chavda, Ph.D., Assistant Professor  
D. B. Patel, Ph.D., Assistant Professor

### Department of Food Processing Technology

H. Pandey, Ph.D., Associate Professor & Head  
G. P. Tagalpallewar, Ph.D., Assistant Professor  
R. B. Modi, Ph.D., Assistant Professor  
S. R. Bhise, Ph.D., Assistant Professor  
N.R. Sardar, Ph.D., Sr. Research Assistant

### Department of Food Plant Operations

S. H. Akbari, Ph.D., Associate Professor & Head  
A. V. Ravani, Ph.D., Assistant Professor

## Food Processing Technology

Fundamentals of Food Processing  
Processing Technology of Liquid Milk  
Processing Technology of Cereals  
Unit Operations in Food Processing  
Processing Technology of Dairy Products  
Processing Technology of Legumes and Oilseeds  
Processin of Spices and Plantation Crops  
Design & Fomulation of Foods  
Processing Technology of Fruits and Vegetables  
Bakery, Confectionery and Snack Products  
Processing of Meat, Fish & Poultry Products  
Processing Technology of Beverages  
Sensory Evaluation of Food Products  
Food Packaging Technology and Equipment

## Food Safety and Quality Assurance

General Microbiology  
Food Chemistry of Macronutrients  
Food Microbiology  
Food Chemistry of Micronutrients  
Food Biochemistry and Nutrition  
Industrial Microbiology  
Food Biotechnology  
Food Plant Sanitation  
Instrumental Techniques in Food Analysis  
Food Additives and Preservatives  
Food Quality, Safety Standards and Certification

## Food Process Engineering

Food Thermodynamics  
Fluid Mechanics  
Post-Harvest Engineering  
Heat and Mass Transfer in Food Processing  
Food Refrigeration and Cold Chain  
Fundamentals of Food Engineering  
Food Plant Utilities and Services  
Food Storage Engineering  
Food Process Equipment Design  
Instrumentation and Process Control in Food Industry  
Application of Renewable Energy in Food Processing

## Food Business Management

Business Management and Economics  
ICT Application in Food Industry  
Marketing Management and International Trade  
Entrepreneurship Development  
Communication and Soft Skills Development  
Project Preparation and Management

## Basic Engineering

Basic Electrical Engineering  
Workshop Technology  
Engineering Drawing and Graphics  
Computer Programming and Data Structures  
Basic Electronics Engineering

## Basic Sciences & Humanities

English Language  
Engineering Mathematics-I  
Environmental Sciences & Disaster Management  
Engineering Mathematics-II  
Statistical Methods and Numerical Analysis

## Food Plant Operations (Student READY Courses)

Student READY - Experiential Learning Programme-I  
Student READY - Experiential Learning Programme-II  
Student READY - Research Project  
Student READY - Seminar  
Student READY - Industrial Trouer  
Student READY - Internship/In-Plant Training





# Course Curriculum – M. Tech. & Ph.D. (Food Technology)

<b>M. Tech. FPT</b> (Major Courses)	<ul style="list-style-type: none"><li>Emerging Technologies in Food Processing*</li><li>Emerging Technologies in Food Packaging*</li><li>Industrial Manufacturing of Food and Beverages* • Food Material and Product Properties • Traditional Foods • Technologies of Convenience Foods • Special Problem *</li></ul>	<b>Ph.D. FPT</b> (Major Courses)	<ul style="list-style-type: none"><li>Novel Technologies for Food Processing and Shelf Life Extension</li><li>Food Packaging</li><li>Food Process Modeling and Scaleup</li><li>Food Manufacturing Technology</li></ul>
<b>M. Tech. FPE</b> (Major Courses)	<ul style="list-style-type: none"><li>Emerging Food Engineering Operations*</li><li>Engineering Properties of Food Materials*</li><li>Transport Phenomenon* • Computer Aided</li><li>Design of Food Plant Machinery and Equipment • Operation Research • Process Control in Food Industries • Special problem/ Summer internship</li></ul>	<b>Ph.D. FPE</b> (Major Courses)	<ul style="list-style-type: none"><li>Concentration and Drying Engineering</li><li>Automation and Robotics</li><li>Food Handling and Storage Engineering</li><li>Novel Food Process Engineering</li><li>Special problem</li></ul>
<b>M. Tech. FSQ</b> (Major Courses)	<ul style="list-style-type: none"><li>Techniques in Food Quality Analysis*</li><li>Microbiology of Food Spoilage and Pathogens* • Advanced Food Chemistry</li><li>Global Food Laws and Regulations • Quality Concepts and Chain Traceability* • Special Problem / Summer Internship • Advances in Food Biotechnology • Fundamentals of Microbial controls in Foods</li></ul>	<b>Ph.D. FSQ</b> (Major Courses)	<ul style="list-style-type: none"><li>Quality Assurance in Food Supply Chain</li><li>Food and Nutraceutical Chemistry</li><li>Food Microbiology and Safety</li><li>Sensory Evaluation of Foods</li><li>Special problem</li></ul>
<b>M. Tech. FPE/FPT/FSQ</b> (Non Credit Comp. Courses)	<ul style="list-style-type: none"><li>Library and Information Services</li><li>Technical Writing and Communications Skills</li><li>Intellectual Property and its Management in Agriculture • Basic Concepts in Laboratory Techniques • Agricultural Research, Research Ethics and Rural Development Programmes</li></ul>	<b>Ph.D. FPT</b> (Comp. Courses)	<ul style="list-style-type: none"><li>Library and Information Services</li><li>Technical Writing and Communications Skills</li><li>Intellectual Property and its Management in Agriculture</li><li>Basic Concepts in Laboratory Techniques</li><li>Agricultural Research, Research Ethics and Rural Development Programmes</li></ul>
<b>M. Tech. FPT</b> (Supporting Courses)	<ul style="list-style-type: none"><li>Post-Harvest Management</li><li>Operation Research</li></ul>	<b>Ph.D. FPT</b> (Supporting Courses)	<ul style="list-style-type: none"><li>Food Analytical Techniques</li><li>Sensory Evaluation of Foods</li></ul>
<b>M. Tech. FPE</b> (Supporting Courses)	<ul style="list-style-type: none"><li>Post Harvest Management</li><li>Food Business Management</li><li>Food Processing Entrepreneurship &amp; Start up</li></ul>	<b>Ph.D. FPE</b> (Supporting Courses)	<ul style="list-style-type: none"><li>Food Analytical Techniques</li><li>Sensory Evaluation of Foods</li><li>Food Business Management</li></ul>
<b>M. Tech. FSQ</b> (Supporting Courses)	<ul style="list-style-type: none"><li>Post-Harvest Management</li><li>Operation Research</li></ul>	<b>Ph.D. FSQ</b> (Supporting Courses)	<ul style="list-style-type: none"><li>Post-Harvest Management</li><li>Operation Research</li></ul>



## Facilities

The college campus has pleasant atmosphere for both the learning and staying with facilities such as bank, ATM, Health Centre etc.

### Modern Classrooms

All classes in the college are conducted in well illuminated and ventilated modern classrooms with audio visual aids.

### Library

The university has a Central Library and Cybrary with collection of more than 1,00,000 books with online access of e-journals, e-books and database. The Cybrary with its 52 work-stations is an excellent facility as a part of e-Library. Four on line database are being monitored on LINUX Server with the help of 100 mbps (BSNL) connectivity in the Cybrary.

Also, the college has its own library-cum-reading room with collection of food technology subject specific books, journals, periodicals, manuals, national and international food regulatory standards etc. A repository of thesis of post graduate students of food processing technology is also available in this library.

### Computer and Internet Facilities

College has separate computer laboratory with LAN and wifi facility that is available for use of students and faculty. The laboratory is connected to the university network having high speed intranet connectivity, library network and internet access. The laboratory is equipped with latest software useful for industry, such as, Design expert, Matlab, AutoCAD, SOLIDWORKS etc.

### Hostels

The college has exclusive girls and boys hostels for the students, namely, Maitreyee Girls' Hostel and Visvesvaraya Boys' Hostel. Both the hostels have sufficient numbers of well ventilated, furnished rooms with all the modern amenities, such as, dining facility, cooler with RO water purifier system, solar water heater system for hot water, television, gym, indoor games, biometric entry/exit and wifi facilities.





# Laboratories

The excellent laboratory facilities offer practical learning opportunities for students in the area of food technology, food quality assurance, food engineering, food industry management and other related subjects. The college has well equipped and state-of-art laboratories which include:

- Food Packaging Technology Laboratory
  - Dairy Technology Laboratory
  - Food Product Development Laboratory
  - Food Processing Technology Laboratory
  - Sensory Evaluation Laboratory
  - Advance Food Processing Technology Laboratory
  - Animal Product Technology Laboratory
  - Food Microstructure Laboratory
  - Advance Food Packaging Technology Laboratory
  - Non Thermal Processing Technology Laboratory
- 
- Food Chemistry Laboratory
  - Food Microbiology Laboratory
  - Food Biotechnology Laboratory
  - Food Quality Assurance Laboratory
- 
- Primary Processing Laboratory
  - Grain Milling Laboratory
  - Storage Engineering Laboratory
  - Engineering Properties Laboratory
  - Mechanical Engineering Laboratory
  - Fluid Mechanics & Material Laboratory
  - Electrical Engineering Laboratory
  - Electronics & Process Control Laboratory
  - Civil Engineering Laboratory
  - Heat & Mass Transfer Laboratory
  - Food Irradiation Research Laboratory
  - Advance Food Engineering Laboratory
  - Biochemical Conversion Laboratory
  - Biomass Gasification Laboratory
  - Solar & Wind Energy Laboratory
  - Environment Engineering Laboratory
- 
- Computer Laboratory
  - Language Laboratory

All the laboratories are equipped with experimental tutors, sophisticated processing and analytical instruments which enable the students to get practical knowledge of subjects taught. Also, post-graduate and doctoral scholars can carry out their research work on problems related to modern food industry.



# Food Quality Testing Laboratory

A special state-of-art Food Quality Testing Laboratory, established by Ministry of Food Processing Industries, Government of India, has all the sophisticated high-end analytical facilities of international standard.

Commercial testing of food samples are carried out in the laboratory for the following parameters besides using it for higher level research.

Fats and Fatty acids
Contaminants
Food Additives & Preservatives
Vitamins
Carotenoids
Mineral Analysis
Sugars and Polysaccharides
Other food analysis
Amino Acids
Nutritional
Enzymes and Proteins
Food Allergens
Organic Acids
Natural Toxins
Color
Residual compounds
Various Microbiological Tests







## Experiential Learning Units

The effective production of safe and nutritious food is a major concern of all stakeholders in the food industries. The technologies and machines developed as part of research are scaled up from laboratory level to pilot plant level for better adoption by the industry and under-standing by students. Therefore, various pilot scale processing lines have been installed in the college for hands on experience and in-plant exposure to the students. The pilot plants are also used to provide training to food industry personnel and unemployed youth. The pilot plant facility is also utilized for testing new technologies and test manufacturing of new food products. Experiential learning with following Pilot plants are available.

- Tomato Product Processing Line
- Fruit & Vegetable Canning Line including Retort
- Food Extrusion Line
- Food Packaging Station
- Individual Quick Freezing (IQF) Line
- Automatic Juice Bottle filling and capping Line
- Food Dehydration Line
- Continuous Frying Line
- Fresh Fruit & Vegetable Handling Line
- Experimental Pulse Mill
- Experimental Biodiesel Plant



## AAU Incubation Center for Food & Agri. Startups

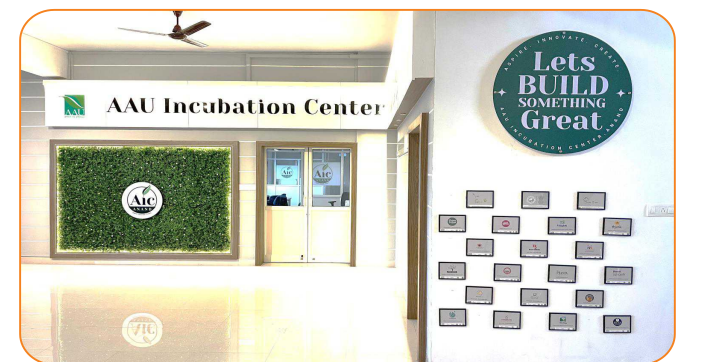
Corporate Identification Number : U73100GJ2022NPL132887



College has established **AAU incubator Center, Anand**, a not-for-profit company established under company's act 2013, with an objective of supporting innovative technology-based start-up enterprises in the field of agriculture, food and allied sectors. The centre is being funded and caters to various state and national projects such as RKVY RAFTAAR Agribusiness Incubator (R-ABI) of Ministry of Agriculture & Farmers Welfare, Government of India, Scheme for Assistance for Start Ups and Innovation & Student Start-up and Innovation Program of Government of Gujarat.

This provides an opportunity for startups to raise their seed funding in the form of grant-in-aid up to Rs. 30 Lakh. Agri-entrepreneurs can visit the website [www.AAUincubator.in](http://www.AAUincubator.in) to apply for incubation programs. The center is equipped with all necessary technical facilities & physical infrastructure required for operating a state of the art incubation centre, such as :

- Exclusive co-working space for entrepreneurs
- Meeting rooms
- Event & Activity space
- 50+ expert mentor's pool
- Dedicated team to support startups
- Seed funding opportunities up to Rs. 30 Lakhs\*



## Food Business Startups Incubated at AIC Anand





## Research Credentials

Continuous evolution and development is imperative for sustaining the food industry. New innovations and use of niche techniques are being used to develop useful products, processes and equipment. The college has excellent research environment with state-of-art equipment and instruments and has handled many sponsored mega projects funded by reputed national and international agencies including World Bank. The college has regular research programs funded by State/Central Government and other organizations. There are also research projects funded by ICAR and other agencies. Overall large number of scientific recommendations based on research outputs have been made by the faculty. The faculty has to its credit two important Indian Patents for designing mechanized process for production of biodiesel. Some of the important machines/technologies/products developed by the college includes:

- Evaporative cooling technologies and devices for on-farm post harvest activity, transportation, storage and distribution of various fruits and vegetables.
- Mechanized post harvest handling and processing of aonla which includes technologies and machines for precooling, pricking, shredding, destoning, juicing, bottling etc.
- Prototypes of eco-friendly mobile vending cum storage system, delta robot for handling of food product, experimental setup for determination of heat of respiration and heat load, mechanized handling and processing for kajukatti and mango pulp ohmic heating system, grader for aonla fruits.
- Production technology of ready-to-serve health drinks/beverages based on aonla, bottle gourd, unripe mango, wheatgrass, wood apple, muskmelon and lime etc.
- Production technology of nutri rich fruit bars, ice cream and low fat spread, sesame spread, microwave assisted popped sorghum grain, superior quality malt flour from Ragi, RTE extruded food product from tomato pomace, vacuum dried khaman.
- Fully automated respiration rate determination systems developed for measurement of respiration rate of various fruits & vegetables.
- Ohmic heating of mango pulp, guava pulp and carrot slices to get the superior juice quality.
- Cryogenic grinding technology for production of powder from cumin, curry leaves, coriander, cardamom, fennel seed and dill seed for maximum retention of active compounds, essential oils and oleoresins
- Technology for supercritical fluid extraction of bioactive compounds, essential oils and oleoresins from spices, condiments and herbs such as basil leaves, ginger and turmeric, pumpkin powder etc.
- Production technology for various dehydrated products such as basil leaf powder, pumpkin powder and its products and vacuum dried ginger flakes, aonla slices, leafy vegetables, high quality microwave dried aonla segments, drumstick (Moringaoleifera) tree leaves etc.
- Product technology for high fibre bun, instant puffed rice, okara based extruded product, millet based supplementary food and kajukatti with artificial sweetener and canned mango slices.
- Sterilization and shelf life extension of chilli powder and pigeon pea by irradiation technology and shelf life extension of tomato fruit using edible coating material
- Decontamination of micro organisms and pesticides from minimally processed fruits & Vegetables.
- Bioethanol production technology using a novel thermotolerant strain of Saccharomyces cerevisiae ETGS1 from potato processing starch waste.
- Production technology of bio-manure granules from digested slurry of biogas plant.

## Extension activities



- College conducts regular training programmes in the area of food processing as well as special programmes as per demand for prospective entrepreneurs, industry persons, farmers, rural youth, gram sevaks and different cadres of Govt. staffs.
- College also participates in various exhibitions, fairs, radio talks to disseminate the knowledge and information on food processing.
- College is also engaged in transferring the developed technology to the industry for its commercial utilization.
- College organizes 3 days training among Rural Farm Womens Farmers on food processing.
- College organized 3 months course on Food Processing Technology for rural youth to create awareness and get knowledge of Food Processing Technology.
- Students from various State Agricultural Universities from Gujarat & all over India come under RAWE and Education Tour Programme to visit various Departments, Laboratories Equipments, instruments of the college related to Food Processing Technology





# Training & Placement

The faculty of the college have live contacts with the industry and hence the students are placed both for training as well as for job after graduation to the reputed industries. Moreover, a full-fledged training and placement cell exists which helps the students in deciding their choice of organization for training and job placement. The college organizes campus interviews for the recruitment of the pass outs by inviting reputed food business houses.

## Job profile of food processing technology graduates & Post graduates

- Processing & packaging: Shift Officers / Technical Officers / Line Managers
- Food Safety officer in state government and central government authorities.
- Quality Control Officers & R&D Specialists
- Regulatory Affairs Experts
- Technical Managers / Sales Executives
- Supply Chain and Logistics Managers
- Maintenance Engineers
- Academic Services

## Prospective industries for employment of food processing technology graduates

- |   |                            |                             |
|---|----------------------------|-----------------------------|
| • Fruits / Vegetables Processing        | • RTE / RTC / Frozen Foods | • Meat & Poultry            |
| • Beverages (Alcoholic / Non-alcoholic) | • Dairy                    | • Edible Oil                |
| • Bakery, Confectionary & Snack Foods   | • Grain Mills              | • Food Processing Equipment |
| • Potato Processing                     | • Spices, Tea & Coffee     | • Food Packaging            |
|   | • Fish & Marine            | • Food Ingredients          |



# Student activities

Every year, the college forms Student Representative Council (SRC) to handle various issues and activities of the students. SRC is a student-operated college committee designed to help promote college spirit and leadership among students. The SRC plans and organizes different co-curricular and extra-curricular activities including sports, literary and cultural events, besides hosting other students related college events. The college organizes welcome and orientation programmes every year for newly admitted students. This is followed by Agmanam – Freshers' Day Celebration, Inter College Literary, Sports and Cultural events, Teachers' Day Celebration, Navratri Celebration, ADROIT – A national level inter college tech fest to celebrate World Food Day, Mrudugandha – Intra college competitions, and Sprout – the Annual Day celebration.

For free interaction and communication of ideas among the students, various guest speakers, and food processing related company experts are invited from time to time. To make the students acquainted with the latest developments taking place in the field of food processing technologies, exposure visits are organized to various food processing exhibitions.

Personality development programmes by professionals on how to write effective resumes, how to face interviews/group discussions, the role of body language and overall development of positive thinking and attitudes is also organized from time to time.

