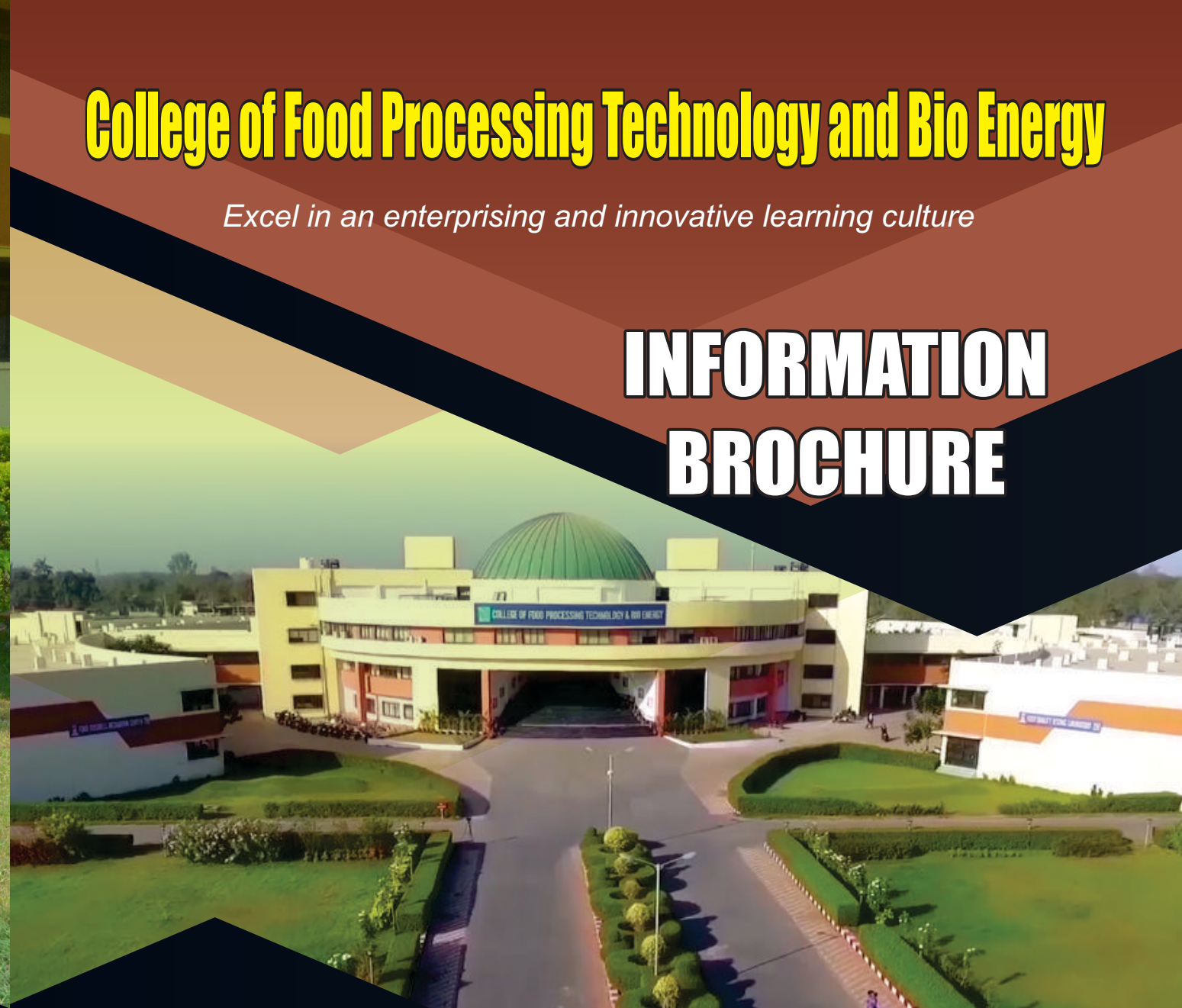


College of Food Processing Technology and Bio Energy

Excel in an enterprising and innovative learning culture

INFORMATION BROCHURE



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Anand Agricultural University
Anand – 388 110, Gujarat, India

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)	4 Semester	7
	Food Processing Technology (FPT)		
	Food Process Engineering (FPE)		
	Food Safety and Quality Assurance (FSQA)	5	
PG	Ph. D (Food Technology)	6 Semester	1
	Food Processing Technology (FPT)		
	Food Process Engineering (FPE)		
	Food Safety and Quality Assurance (FSQA)		2

* 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 masters degree programme should possess a four years B.E./ B.Tech degree in Food Technology/ Dairy Technology/ Food Processing Technology/ Food Engineering/ Agricultural Engineering/ Chemical Engineering 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

Departments & Faculty



To oversee the academic and other activities, the college is divided in to six 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 and Dean Dr. S. Dutta, Ph D

Department of
Food Processing Technology
H. Pandey, Ph D, Associate Prof. & Head
G. P. Tagalpallewar, Ph.D., Asstt. 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 Quality Assurance
B. H. Joshi, Ph D, Associate Prof. & Head
D. H. Patel, Ph D, Assistant Professor
J. K. Momin, Ph D, Assistant Professor
R. M. Dhingani, M Sc, Assistant Professor

Department of
Food Engineering
V. B. Bhalodiya, Ph D, Associate Prof. & Head
K. V. Vala, Ph D, Assistant Professor
N. V. Shah, M E, Assistant Professor
M. A. Makwana, M Tech, Assistant Professor
A. N. Nakiya, M Tech, Assistant Professor
T. H. Bhatt, M E, Assistant Professor

Department of
Food Business Management
S. Dutta, Ph D, Associate Prof. & Head
P. S. Parsania, Ph D, Assistant Professor
N. M. Chavda, Ph D, Assistant Professor
D. B. Patel, Ph D, Assistant Professor

Department of
Post Harvest Engineering & Technology
A. Nema, Ph D, Assistant Prof. & Head
S. V. Anadani, Ph D, Sr. Research Assistant

Department of
Bio-Energy
S. S. Kapdi, Ph D, Professor & Head
J. P. Rathod, M Tech, Sr. Research Assistant

Department of
Food Plant Operations
S. H. Akbari, Ph D, Associate Prof. & Head
A. V. Ravani, Ph D, Assistant Professor

Department of
Food Safety & Testing
H. G. Bhatt, Ph D, Associate Prof. & Head
K. S. Damle, M Sc, Assistant Professor
A. M. Patel, Ph.D., Assistant Professor

Course Curriculum – B. Tech. (Food Technology)

Food Processing Technology

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

Food Quality Assurance

General Microbiology
Food Chemistry of Macronutrients
Food Chemistry of Micronutrients
Food Microbiology
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 Engineering

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

Food Business Management

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



Basic Engineering

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

Basic Sciences & Humanities

English Language
Engineering Mathematics-I
Environmental Science & 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 Tour
Student READY - Internship/In-Plant Training

Course Curriculum – M. Tech. (Food Technology)

Supporting Courses
(5+1+20 Credits)

- Experimental Design
- Operation Research
- Seminar
- Thesis

Compulsory Courses

- Library and Information Services • Technical Writing and Communication Skills • Intellectual Property and its management in Agriculture (e-course)
- Basic concepts in Laboratory Techniques • Agricultural Research, Research ethics and Rural Development Programs (e-course) • Disaster Management (e-course)

Minor Courses (9 Credits)

From the major courses of other two disciplines

FSQA

- Advances in Analytical Techniques • Food Legislations, Standards and Food Safety Management Systems • Advances in Food Chemistry and Nutrition • Advances in Food Additives & Preservatives • Advances in Fermentation Technology • Advances in Food Microbiology • Advances in Food Biotechnology

FPE

- Computer aided design of food plant, machinery and equipment • Advances in food process engineering • Advances in instrumentation & process control in food industry • Advances in dairy engineering • Engineering, textural & rheological characteristics of food materials • Radiation in food processing • Post harvest management and storage engineering

FPT

- Advances in Food Packaging Technology • Advances in Food Processing Technology • Brewing Technology • Enzymes in Food Processing • Functional Foods and Nutraceuticals • Lipid Technology • Protein Technology • Technology for RTE/RTC Food Products • Technology of Frozen Foods • Traditional and Value-added Food Products



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:

- Primary processing lab
- Grain milling lab
- Storage engineering lab
- Engineering properties lab

- Food processing technology lab
- Food product development lab
- Dairy products lab
- Packaging technology lab
- Sensory lab
- Food rheology lab
- Advance food technology lab
- Animal products lab

- Food chemistry lab
- Food microbiology lab
- Food biotechnology lab
- Food quality assurance lab

- Mechanical engineering lab
- Fluid mechanics & material lab
- Electrical engineering lab
- Electronics & process control lab
- Civil engineering lab
- Heat & mass transfer lab
- Food irradiation research lab
- Advance food engineering lab

- Biochemical conversion lab
- Biomass gasification lab
- Solar & wind energy lab
- Environment engineering lab

- Computer Lab
- Language Lab

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 NABL accredited 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 understanding 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.

- Canning Line
- Juice Bottling Line
- Food Extrusion Line
- Individual Quick Freezing (IQF) Line
- Food Dehydration Line
- Continuous Frying Line
- Tomato Processing Line
- Fresh Fruit & Vegetable Handling Line
- Experimental Pulse Mill
- Experimental Biodiesel Plant
- Bio Energy Park

Incubation Centre-cum-Centre of Excellence in Food Processing

The college has an unique Incubation Centre-cum-Centre of Excellence in food processing equipped with the modern, latest and sophisticated equipment, instruments, set-ups to facilitate world class research. Besides various food processing lines, the facilities include Gamma irradiation unit, cryogenic grinding unit, super-critical fluid extraction system, solar hybrid VAM refrigeration system and others.

The centre provides students an excellent opportunity to develop analytical and entrepreneurial skills, knowledge through hands-on experience and confidence in their ability to design and execute project work.

The facility will also be utilized for testing of new technologies and test manufacturing of new food products by prospective entrepreneurs and start-ups. The Government of Gujarat through Industry Commissionerate has appointed Anand Agricultural University, Anand as Nodal Institute under the Start-up Support Scheme and this Incubation center will be used to serve as an incubation unit for enabling prospective entrepreneurs for commercialization of their ideas into products. The users shall be assisted from concept to commercialization, and enabled to have new product prototypes tested and evaluated. The pilot plants could be used to provide training to food industry personnel and unemployed youth.

The centre has obtained Food Safety and Standard Authority of India license for manufacturing, re-packaging and re-labeling of different food products. The Centre has made an MoU with GUJCOMASOL for supply of raw material and marketing of the final processed food products. The "Incubation Centre-cum-Centre of Excellence in Food Processing" at College of Food Processing Technology and Bio-energy, Anand Agricultural University, Anand is formally inaugurated by Shri Narendra Modi, Hon'ble Prime minister of India.



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 in the last six years more than 58 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.
- Cryogenic grinding technology for production of powder from cumin, curry leaves, coriander and cardamom 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 kajukatli with artificial sweetener and canned mango slices.
- Sterilization or shelf life extension of chilli powder and pigeon pea by irradiation technology and edible coating material shelf life extension of tomato fruit.
- 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 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. Bio diesel manufacturing technology have been transferred/licensed to United Phosphorous Limited, Mumbai. Ready to puff rice technology have been transferred/licensed to Pushaki Impex Pvt. Ltd., Ahmedabad.

The institute also have international MOU for new food product development with The Food Development Centre (FDC) of Manitoba Government, Canada.



Training & Placement

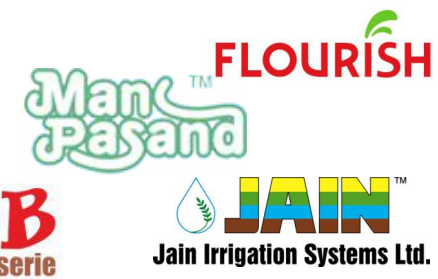
The faculty of the college have live contacts with the industry and hence the students are placed both for training as well as for job after graduation to the reputed industries. Moreover, a full-fledged training and placement cell exists which helps the students in deciding their choice of organization 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

- ✓ Processing & packaging: Shift Officers / Technical Officers / Line Managers
- ✓ 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 | ✓ Spices, Tea & Coffee |
| ✓ Beverages (Alcoholic / Non-alcoholic) | ✓ Fish & Marine |
| ✓ Bakery, Confectionary & Snack Foods | ✓ Meat & Poultry |
| ✓ Potato Processing | ✓ Edible Oil |
| ✓ RTE / RTC / Frozen Foods | ✓ Food Processing Equipment |
| ✓ Dairy | ✓ Food Packaging |
| ✓ Grain Mills | ✓ 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.



COLLEGE OF HORTICULTURE
ANAND AGRICULTURAL UNIVERSITY, ANAND