M.Sc. by Research

(Food Science, Technology & Innovation)

Texture Analyser

Blend of fundamental theory with hands-on research experience using state-of-art facilities under the tutelage of experienced instructors with decades of Corporate R&D experience.

Click here to know more
https://www.tdu.edu.in/courses/m.sc-by-research---food-science-technology-and-innovation

GC-MS

Twin Screw Extruder

HPLC

Rancimat

Scientific kitchen

The infrastructure includes
13 laboratories and pilot plants to
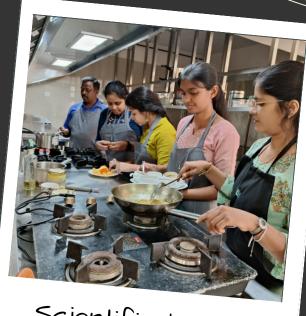conduct research of food science,
technology & nutrition

tdu.edu.in

COURSE OVERVIEW

Unique Approach

If you want to make a difference to everyday health and nutrition of the population by designing tasty food which will contribute to creating community livelihood and positively impact planetary health and environment then TDU " Masters by Research in Future Foods – Science & Technology" will be the foundation stone. Curiosity driven learning which will make you stand out in the real job world

As a student you will develop skill sets for being productive Food Researcher in Academic Institutes, Industrial R&D labs and Start-Up ventures by going through a uniquely designed "Learning by Doing" curricula. Emphasis on "Future Foods Courses" and using "Design Thinking" tools in identifying current gaps in knowledge and Consumer Pain Points and diligently exploring solutions makes our students productive in Food Science & Technology career. Successful scientific career is about joining dots of latest knowledge in high quality scientific journals, technology under development in Institutes/Ingredient Suppliers and Consumer Trends from trade journals and symposiums – your Research Project will ensure experience of scanning and reporting all these domains

If you are wanting to create foods of the future by bringing together cutting-edge areas of molecular gastronomy, culinary sciences, microbiome, personalised nutrition with novel processing & food structuring techniques such as extrusion and homogenisation and connecting it all to to our traditional knowledge of food – This Course Is for You!!

Our Learning Lab Module

- Students' induction program exposes them in the first two weeks to more than 25 research domains currently being pursued by Research Associates for them to immerse themselves in domains of :
- Protein processing including texturizing vegetarian proteins for meat analogue applications
- Plant-based milks
- Plant protein extraction, concentration & isolation
- Extruded snacks using millets & native varieties of rice
- Designing functional foods for iron deficiency anemia, glycemic control & brain health
- Natural anti-oxidants for oils & ghees
- Botanical ghrita's & oils.
- Aroma extraction from botanicals & araka's
- Fermented foods & beverages including Kombucha
- Micro-processing unit design for tea & botanicals such as amla & greens for value addition
- Integrative personalized nutrition for the Masses
- Urban food forests and wild edibles
- Selecting and growing herbs and spices which will add diversity to daily food as well as soil in regenerative agriculture

WHY STUDY WITH US

The MSc by Research program at TDU has many unique features that benefit individuals looking to enhance careers in the many areas of the food - from human health, to post-harvest processing for value addition to sustainability. It is of particular benefit to individuals with an interest in areas such as new product development, food processing and manufacturing and personalised nutrition.

The unique features are :

- You will be researching & developing your own innovative functional food product - from concept to prototype to process development.
- You will learn to integrate the key elements of food chemistry, food processing, effect of food on human biology while developing your functional food product.
- You will get an exposure of interacting with industry.
- Three 'Program Certification' offered to suit interests & skills of food technologists, biologists, agri- and nutrition scientists -
    - Processing & Productization,
    - Biology & Health Benefits,
    - Culinary Science & Principles

- An education that is way beyond traditional classroom teaching and uses hands on work in the Universities 13 laboratories, pilot plants and research kitchen.
- A trans-disciplinary approach that integrates traditional knowledge with modern food processing concepts & culinary sciences.
- Content created by experienced professionals with academic & industry experience

Who is the course designed for?

The course is designed for students with an interest in new process development and product design in foods with consumer benefits in mind. The course is also designed for those interested in created a food/beverage based start-up and these students will be guided to develop a pitch and a business proposal based on their research area.

OUR PROGRAMS

01 ELIGIBILITY

Students from diverse backgrounds are welcome. Examples are bachelor's degree in engineering, data analytics, biological sciences, agricultural sciences, biotechnology, food science, nutrition, hotel management, etc.

Fees: Charges will be as per University norms for the Post Graduate Courses
The number of seats for the course are restricted to 10 per year.

02 DURATION AND CREDITS OF THE COURSE

The minimum duration of MS by Research in Food Innovation & Product Design is 2 years. This is a 80 credit program with 30 credits for course work (class room and laboratory/pilot plant practical) and 50 credits for project work (project guided by mentors).

Emphasis will be on learning by doing through projects, case studies and assignments. Help will be provided to procure industrial internships for interested students.

03 LIST OF COURSES TO CHOOSE

- Research Methodologies
- Trans-Disciplinary Knowledge Framework
- Research Ethics

- Overview of Food Processing Technology
- Food Chemistry
- Food Microbiology
- Ayurveda Food Processing
- Food Extrusion (with focus on proteins)
- Food Characterization & Analysis
- Protein Futures
- Food & Microbiome
- Baking Technology (including proteins in baking)
- Fermented Foods & Beverages
- Indian Culinary Science (Deconstructing recipes from Ayurveda)
- Botanical Ingredient Authentication & Specification
- Food & Body-typing – The Prakriti-Dosha Framework & AyurAhaar Database

- Food: Systems Thinking – Food for a Sustainable Planet
- Food: Design Thinking – New Product Design, Food Ingredients & Additives
- Food: Integrative Health Thinking – Nutrition Basics & Personalized Nutrition

- Food Safety
- Food Regulatory Affairs
- Quality Assurance

04 CAREER OPPORTUNITIES

Graduates will be able to take on opportunities in the food and beverage innovation sector. They can seek employment in industry or work on creating their own start-up. Graduates can also apply for higher studies within India or abroad.

Focus of course & research work will be in following areas

- Food Science & Technology
- R & D Project Management & Innovation Cycles – From Consumer Need to Consumer Desired Products
- Authentication, Quality & Sustainable Sourcing of Ingredients
- Healthy Food Design – Journey from In silico Design to Prototyping to Product Design
- Food Unit Operations & Process Development Ÿ Pilot plant operation for foods process development
- Sensory & Chemical Analysis of – Molecular Basis of Sensory Attributes
- Extrusion Processing of Foods
- Proteins Processing
- Food Systems

Facility @ TDU The infrastructure includes 13 laboratories and pilot plants to conduct research of food science, technology & nutrition. These include

Sl.No	Laboratory/ Pilot Plant	Key equipment	Purpose
1	Kitchen Laboratory	Multi kitchen stations. Cooking Hobs, Traditional Hobs, Wet & Dry Grinding section, Blender, Juicer, Slicer, Kneader, Oven, Precision Bath, Microwave, Refrigerator, Combi oven, Merry Chef, Sous Vide, tandoor, fryer, vacuum machine, Freezer, Pantry, centrifuge, rotavap.	Rapid prototyping, training & workshops, video recording for nutritional videos.
2	Food & Dravya Analytical Laboratory	HPTLC, HPLC with PDA & RI detectors, LC-MS, GC-FID, GC-MS, UV spectrophotometer, FTIR, Texture analyser, Rancimat, Kjeldahl	Volatile and non-volatile molecular analysis.
3	Food & Phyto Chemistry Laboratory	Weighing balance, pH & Conductivity meter, Colorimeter, Rotary water bath, circulating chiller, wet chemistry set-up, extraction columns, distillation columns, glass ware, chemicals	Food chemistry, separations and fractionations, phytochemical analysis of ingredients
4	Microbiology Laboratory	Incubators, Laminar flow hoods, microscope, workbench for media preparation, autoclave	Microbial analysis, microbials safety testing of foods
5	Multi-omics Laboratory	RT PCR, thermocyclers, lyophilizer, bench top centrifuge, probe sonicator, gel doc system	Markers for inflammation, obesity etc.
6	Cell Biology Laboratory	Incubators, Shaker tables, media preparation room, autoclave, laminar flow hoods	Cell models for bioavailability, inflammation, glucose metabolism etc.
7	Microscopy Room	Upright and inverted microscopes, microtome, slide preparation table, digital camera	Support for microbiology, cell cultures and food structuring
8	Small animal model lab Drosophila Laboratory	Drosophila laboratory & C. elegans laboratory	Model systems for nutrition studies on obesity, rejuvenation, nootropics

Facility @ TDU The infrastructure includes 13 laboratories and pilot plants to conduct research of food science, technology & nutrition. These include

Sl.No	Laboratory/ Pilot Plant	Key equipment	Purpose
9	Botanical Post Harvest Processing Pilot Plant	Withering trough, carding machine, panning machine, tray dryer, crush tear curl machine, fluid bed dryer, Cuter, Coarse grinder, fine grinder, sorting machine	Raw material 'Postharvest' processing pilot plant including moisture reduction, shaping and drying Raw material preparation pilot plant – Size reduction and sorting of raw material
10	Proteins & Extrusion Pilot Plant	Brabender twin screw extruder, GEA Homogeniser, Protein extraction & spray drying	Proteins processing & extruded foods
11	Wet Pilot Plant	Extractor, Cooking Pan, Vacuum cooking vessel, thin Film evaporator, juicer and pulper, steam boiler, baby boiler, chiller, water softener, vacuum pump, air pump, hot water generator, spray dryer, oil expeller with drive	Wet pilot plant for preparing foods from prepared raw materials
12	Dairy & Fermented Foods Facility	Cream separator, butter churner, autoclave, incubating chambers, laminar flow hood, fermentation tanks	Fermented foods like curd, gruels, asava, arishta, kombucha
13	Product Design Laboratory	Kneaders with high power drives, wet grinders, mixing tank, dissolution test, disintegration test, penetration test machine, water activity meter	Grinding, mixing, kneading, tableting laboratory (non-heat operations). Testing of products including dissolution, disintegration, hardness, water activity

SELECTION PROCESS

SELECTION BASED ON

- Academic credentials & courses taken during Bachelors
- A Statement of Purpose spelling out the reasons for wanting to enroll in this program.
- Two reference letters from faculty working in college/research institute who know you reasonably well.
- Personal interview

Students will get a chance to work in laboratory & pilot plant with high end equipment & instruments on industry relevant research topics.

HOW TO APPLY

Download the application form from www.tdu.edu.in
You may send an email request to admissions@tdu.edu.in
Fill up the application form and send it to the address mentioned below along with Rs 500 /- through online transfer OR DD/ Cheque in the favour of "ITD-HST" General Fund" payable at Bangalore.
Frequency of admission: Throughout the year.

Kindly use the TDU payment gateway for course
The link is provided below
https://www.tdu.edu.in/online-fee-payment
Please mention the name of the course in the Remarks section as
M.Sc by Research - Food Science Technology and Innovation

PROGRAM DIRECTOR

Gurmeet Singh
Professor & Dean Research & Outreach
gurmeet.singh@tdu.edu.in

Suganthi Fathima J
Program Secretary
Mobile: 9353768130
Email: sugandhi.rani@tdu.edu.in

The University of Trans-Disciplinary Health Sciences and Technology

CONTACT US

The University of Trans-disciplinary Health Sciences and Technology
(A Karnataka State Private University) 74/2, Jarakabande Kaval
Post Attur Post, Yelahanka, Bengaluru – 560064

Phone: 080 28568000
Email us: sugandhi.rani@tdu.edu.in
Website: www.tdu.edu.in