

**GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)**

(Deemed to be University)

VISAKHAPATNAM \* HYDERABAD \* BENGALURU

Accredited by NAAC with A<sup>++</sup> Grade

## **GITAM School of Science**



## **CURRICULUM AND SYLLABUS**

### **2 Year Postgraduate Programme PMFST02: M.Sc. Food Science and Technology**

w.e.f. 2025-26 admitted batch  
(Updated on July 2025)

# **Academic Regulations**

**Applicable for the Postgraduate Programmes in the  
Schools of Humanities & Social Sciences and Science  
(except M.C.A)**

**<https://www.gitam.edu/academics/academic-regulations>**

# **GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

## **Vision**

GITAM will be an exceptional knowledge-driven institution advancing on a culture of honesty and compassion to make a difference to the world.

## **Mission**

- Build a dynamic application-oriented education ecosystem immersed in holistic development.
- Nurture valuable futures with global perspectives for our students by helping them find their ikigai.
- Drive impactful integrated research programmes to generate new knowledge, guided by integrity, collaboration, and entrepreneurial spirit.
- Permeate a culture of kindness within GITAM, fostering passionate contributors.

## **Quality Policy**

To achieve global standards and excellence in teaching, research, and consultancy by creating an environment in which the faculty and students share a passion for creating, sharing and applying knowledge to continuously improve the quality of education.

# **GITAM School of Science**

## **Vision**

Nurturing a high-quality Science Education and Research by providing a best learning ecosystem to create world class academicians and researchers.

## **Mission**

- To teach the most renewed curriculum that lay the foundation for students to start exciting careers in academia, research, and industry.
- To foster an environment of healthy curiosity, an innovative mindset, and a strong desire to contribute to the science world.
- To advance our understandings of the natural processes of Physical, Chemical and Biological systems for a better habitable world.
- To inculcate a strong sense of empathy, integrity, and trust in the GITAM Fraternity with a strong commitment towards society and environment.

## **VISION AND MISSION OF THE DEPARTMENT**

### **VISION**

Fostering a seamless and innovative interdisciplinary research-driven academic ecosystem to address complex biological challenges, by reinforcing critical thinking, creativity, and collaboration

### **MISSION**

- Holistic development of the students through interdisciplinary research and teaching programs with focus on contemporary problems in health, food, disease and environment
- Encourage students to embrace their curiosity to understand the natural processes and boost entrepreneurship for sustainable development
- To emerge as centre of excellence by addressing global challenges in personalized food and medicine, sustainable agriculture and environment through cutting-edge and collaborative research
- Nurture a culture of honesty, kindness, empathy and trust among the Life Sciences fraternity with a strong commitment towards all life on earth and its environment

### Programme Educational Objectives (PEOs)

- PEO 1:** To provide the knowledge for successful careers in food industries, and in the institutions of higher learning.
- PEO 2:** To provide hands-on experience in basic tools and techniques and make students competent in food sciences and allied areas.
- PEO 3:** To motivate the future food technologists through professional, ethical development and research in food science and technology.
- PEO 4:** Enable the graduates for becoming entrepreneurs.
- PEO 5:** To introduce the students various societal needs and global food security challenges for taking up a dissertation in this direction.

#### PEO Articulation

|           | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 |
|-----------|------|------|------|------|------|
| <b>M1</b> | 2    | 3    | 3    | 3    | 1    |
| <b>M2</b> | 3    | 2    | 1    | 3    | 3    |
| <b>M3</b> | 3    | 2    | 2    | 3    | 1    |
| <b>M4</b> | 2    | 2    | 3    | 3    | 3    |

*3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation*

**Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)**

At the end of the Programme the students would be able to demonstrate:

|              |                                                                                                                                                                                                                                                                             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PO1:</b>  | Students will be able to acquire knowledge of food science and nutrition fundamentals, food chemistry, and source and variability of raw food materials and biochemical changes during processing and preservation.                                                         |
| <b>PO2:</b>  | Students will understand the properties and reactions of various food components and select the appropriate analytical method when presented with a practical problem.                                                                                                      |
| <b>PO3:</b>  | Students learn to identify the key pathogens and spoilage microorganisms in foods and the conditions under which they will grow, and laboratory techniques to identify microorganisms in food.                                                                              |
| <b>PO4:</b>  | Students can describe the unit operations, mass, and energy balances required in food processing to produce a given food product                                                                                                                                            |
| <b>PO5:</b>  | Students learn to describe the basic principles and practices of cleaning and sanitation in food processing operations, and explain the properties and uses of various packaging materials.                                                                                 |
| <b>PO6:</b>  | Students learn to apply and include the principles of food science in practical, real-world situations and problems.                                                                                                                                                        |
| <b>PSO1:</b> | Understand the composition of food, the role of each component and their interaction, their roles in food processing.                                                                                                                                                       |
| <b>PSO2:</b> | Learn the detailed principles, procedures, and applications of various chromatographic and electrophoretic techniques for successfully purifying food proteins to homogeneity.                                                                                              |
| <b>PSO3:</b> | Will apply the knowledge of various spectrophotometric methods to quantify the desired compound in the given solutions.                                                                                                                                                     |
| <b>PSO4:</b> | Will be able to describe the importance of microbiology to food production and food safety and demonstrate the role and significance of microbial inactivation, adaptation, and environmental factors on the growth and response of microorganisms in various environments. |
| <b>PSO5:</b> | Will be able to design food plant, identify the instruments required for processing by understanding principles followed by preservation techniques, and successful packaging method employment with good marketing skills                                                  |

## **Curriculum Structure** *(Flexible Credit System)*

### Minimum Credit Requirements to Award Degree Under Each Category

| S.No                          | Course Category               |    | Minimum Credit Requirement                   |                                                       |                                             |
|-------------------------------|-------------------------------|----|----------------------------------------------|-------------------------------------------------------|---------------------------------------------|
|                               |                               |    | 2 Year PG<br>(2nd year-Course<br>Work alone) | 2 Year PG<br>(2nd year - Course<br>Work and Research) | 2 Year PG<br>(2nd year -<br>Research alone) |
| 1                             | Programme Core Courses & Labs | PC | 28                                           | 28                                                    | 28                                          |
| 2                             | Programme Electives Courses   | PE | 8                                            | 8                                                     | 8                                           |
| 3                             | Research Methodology          | FC | 4                                            | 4                                                     | 4                                           |
| 4                             | Seminar                       | FC | 1                                            | 1                                                     | 1                                           |
| 5                             | Term Paper                    | FC | 1                                            | 1                                                     | 1                                           |
| 6                             | Internship                    | FC | 4                                            | 4                                                     | 4                                           |
| Total (At the end of I Year)  |                               |    | 46                                           | 46                                                    | 46                                          |
| 7                             | Programme Core Courses        | PC | 40                                           | 20                                                    | 0                                           |
| 8                             | Programme Electives Courses   | PE |                                              |                                                       |                                             |
| 9                             | Research Project              | FC | 0                                            | 20                                                    | 0                                           |
| 10                            | Research Dissertation         | FC | 0                                            | 0                                                     | 40                                          |
| Total (At the end of II Year) |                               |    | 86                                           | 86                                                    | 86                                          |

## 2 Year PG programme:

### Semester I and II: Common Structure for Course Work, Course Work & Research and Research Alone

| Course Code                                | Category | Level | Course Title                                                              | L  | T | P | S | J | C |
|--------------------------------------------|----------|-------|---------------------------------------------------------------------------|----|---|---|---|---|---|
| Semester - I                               |          |       |                                                                           |    |   |   |   |   |   |
| 25MFST6151                                 | PC       | 600   | <a href="#">Food Analysis Techniques</a>                                  | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6161                                 | PC       | 600   | <a href="#">Microbiology of Foods</a>                                     | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6171                                 | PC       | 600   | <a href="#">Food Chemistry</a>                                            | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6181                                 | PC       | 600   | <a href="#">Analysis of Foods Laboratory</a>                              | 0  | 0 | 4 | 0 | 0 | 2 |
| 25MFST6191                                 | PC       | 600   | <a href="#">Microbial Methods Laboratory</a>                              | 0  | 0 | 4 | 0 | 0 | 2 |
| 25MFST6666                                 | FC       | 600   | Seminar                                                                   | 0  | 0 | 0 | 0 | 2 | 1 |
| Choose any one of the following electives: |          |       |                                                                           |    |   |   |   |   |   |
| 25MFST6201                                 | PE       | 600   | <a href="#">Human health and nutrition</a>                                | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6211                                 | PE       | 600   | <a href="#">Bakery and Confectionery Technology</a>                       | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6221                                 | PE       | 600   | <a href="#">Dairy Technology</a>                                          | 4  | 0 | 0 | 0 | 0 | 4 |
| Total Credits                              |          |       |                                                                           | 21 |   |   |   |   |   |
| Semester - II                              |          |       |                                                                           |    |   |   |   |   |   |
| 25MFST6231                                 | PC       | 600   | <a href="#">Principles of Food Engineering</a>                            | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6241                                 | PC       | 600   | <a href="#">Technology of Plant Foods, Spices and Plantation Products</a> | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6251                                 | PC       | 600   | <a href="#">Principles of Food Engineering Laboratory</a>                 | 0  | 0 | 4 | 0 | 0 | 2 |
| 25MFST6261                                 | PC       | 600   | <a href="#">Technology of Foods Laboratory</a>                            | 0  | 0 | 4 | 0 | 0 | 2 |
| 25MFST6444                                 | FC       | 600   | <a href="#">Research Methodology</a>                                      | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6777                                 | FC       | 600   | Term Paper                                                                | 0  | 0 | 0 | 0 | 2 | 1 |
| 25MFST6333                                 | FC       | 600   | Internship                                                                | 0  | 0 | 0 | 0 | 8 | 4 |
| Choose any one of the following electives: |          |       |                                                                           |    |   |   |   |   |   |
| 25MFST6271                                 | PE       | 600   | <a href="#">Post-Harvest Technology</a>                                   | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6281                                 | PE       | 600   | <a href="#">Food Biotechnology and Nanotechnology</a>                     | 4  | 0 | 0 | 0 | 0 | 4 |
| 25MFST6291                                 | PE       | 600   | <a href="#">Food Waste Management</a>                                     | 4  | 0 | 0 | 0 | 0 | 4 |
| Total Credits                              |          |       |                                                                           | 25 |   |   |   |   |   |

### 2nd Year - Research alone:

| Course Code    | Category | Level | Course Title               | L  | T | P | S | J  | C  |
|----------------|----------|-------|----------------------------|----|---|---|---|----|----|
| Semester - III |          |       |                            |    |   |   |   |    |    |
| 25MFST7888     | FC       | 700   | Research Dissertation - I  | 0  | 0 | 0 | 0 | 40 | 20 |
| Total Credits  |          |       |                            | 20 |   |   |   |    |    |
| Semester – IV  |          |       |                            |    |   |   |   |    |    |
| 25MFST7999     | FC       | 700   | Research Dissertation - II | 0  | 0 | 0 | 0 | 40 | 20 |
| Total Credits  |          |       |                            | 20 |   |   |   |    |    |

**2nd Year – ‘Course Work alone’ & ‘Coursework and Research’:**

| <b>Semester – III</b><br><b>(Common Structure for ‘Course Work alone’ &amp; ‘Course Work and Research’)</b> |                 |              |                                                             |           |          |          |          |          |          |
|-------------------------------------------------------------------------------------------------------------|-----------------|--------------|-------------------------------------------------------------|-----------|----------|----------|----------|----------|----------|
| <b>Course Code</b>                                                                                          | <b>Category</b> | <b>Level</b> | <b>Course Title</b>                                         | <b>L</b>  | <b>T</b> | <b>P</b> | <b>S</b> | <b>J</b> | <b>C</b> |
| 25MFST7181                                                                                                  | PC              | 700          | <a href="#">Modern Food Packaging Technologies</a>          | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7191                                                                                                  | PC              | 700          | <a href="#">Technology of Animal Foods</a>                  | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7201                                                                                                  | PC              | 700          | <a href="#">Food Processing and Preservation</a>            | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7211                                                                                                  | PC              | 700          | <a href="#">Product Development and Analysis Laboratory</a> | 0         | 0        | 4        | 0        | 0        | 2        |
| 25MFST7221                                                                                                  | PC              | 700          | <a href="#">Food Processing and Preservation Laboratory</a> | 0         | 0        | 4        | 0        | 0        | 2        |
| <b>Choose any one of the following electives:</b>                                                           |                 |              |                                                             |           |          |          |          |          |          |
| 25MFST7231                                                                                                  | PE              | 700          | <a href="#">Food Innovation Process</a>                     | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7241                                                                                                  | PE              | 700          | <a href="#">Food Additives and Flavour Technology</a>       | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7021                                                                                                  | PE              | 700          | <a href="#">Fermentation Technology</a>                     | 4         | 0        | 0        | 0        | 0        | 4        |
| <b>Total Credits</b>                                                                                        |                 |              |                                                             | <b>20</b> |          |          |          |          |          |

**Course Work alone**

| <b>Semester - IV</b>                              |                 |              |                                                                       |           |          |          |          |          |          |
|---------------------------------------------------|-----------------|--------------|-----------------------------------------------------------------------|-----------|----------|----------|----------|----------|----------|
| <b>Course Code</b>                                | <b>Category</b> | <b>Level</b> | <b>Course Title</b>                                                   | <b>L</b>  | <b>T</b> | <b>P</b> | <b>S</b> | <b>J</b> | <b>C</b> |
| 25MFST7251                                        | PC              | 700          | <a href="#">Clinical and Therapeutic Nutrition</a>                    | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7261                                        | PC              | 700          | <a href="#">Food Safety Management</a>                                | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7271                                        | PC              | 700          | <a href="#">Clinical and Therapeutic Nutrition Laboratory</a>         | 0         | 0        | 4        | 0        | 0        | 2        |
| 25MFST7281                                        | PC              | 700          | <a href="#">Food Safety, Standards and Quality Control Laboratory</a> | 0         | 0        | 4        | 0        | 0        | 2        |
| <b>Choose any one of the following electives:</b> |                 |              |                                                                       |           |          |          |          |          |          |
| 25MFST7141                                        | PE              | 700          | <a href="#">Mushroom Technology</a>                                   | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7291                                        | PE              | 700          | <a href="#">Enzymes in Food Processing</a>                            | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7301                                        | PE              | 700          | <a href="#">Snack Food Technology</a>                                 | 4         | 0        | 0        | 0        | 0        | 4        |
| <b>Choose any one of the following electives:</b> |                 |              |                                                                       |           |          |          |          |          |          |
| 25MFST7311                                        | PE              | 700          | <a href="#">Advances in Millet Processing Technology</a>              | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7321                                        | PE              | 700          | <a href="#">Sensory Science and Consumer Behaviour</a>                | 4         | 0        | 0        | 0        | 0        | 4        |
| 25MFST7331                                        | PE              | 700          | <a href="#">Lipid Science and Technology</a>                          | 4         | 0        | 0        | 0        | 0        | 4        |
| <b>Total Credits</b>                              |                 |              |                                                                       | <b>20</b> |          |          |          |          |          |

**Coursework and Research**

| <b>Semester – IV</b> |                 |              |                     |           |          |          |          |          |          |
|----------------------|-----------------|--------------|---------------------|-----------|----------|----------|----------|----------|----------|
| <b>Course Code</b>   | <b>Category</b> | <b>Level</b> | <b>Course Title</b> | <b>L</b>  | <b>T</b> | <b>P</b> | <b>S</b> | <b>J</b> | <b>C</b> |
| 25MFST7555           | FC              | 700          | Research Project    | 0         | 0        | 0        | 0        | 40       | 20       |
| <b>Total Credits</b> |                 |              |                     | <b>20</b> |          |          |          |          |          |



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