



**M S RAMAIAH  
UNIVERSITY OF APPLIED SCIENCES**

**Programme Specifications**  
**M.Sc., in Food Science and Technology**

**Batch-2019**

**Department of Food Technology**  
**Faculty of Life and Allied Health Sciences**  
**M S Ramaiah University of Applied Sciences,**  
**University House,**  
**New BEL Road, MSR Nagar, Bengaluru – 560 054**  
**[www.msruas.ac.in](http://www.msruas.ac.in)**

<b>Programme Specifications: M.Sc.-Food Science and Technology</b>	
<b>Faculty</b>	Faculty of Life and Allied Health Sciences
<b>Programme</b>	M.Sc.-Food Science and Technology
<b>Dean of Faculty</b>	

**1. Title of the Award**

M.Sc.-Food Science and Technology

**2. Modes of study**

Full-Time

**3. Awarding Institution / Body**

M.S. Ramaiah University of Applied Sciences – Bengaluru, India

**4. Joint Award**

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**5. Teaching Institution**

Department of Food Technology, Faculty of Life and Allied Health Sciences

**6. Date of Programme Specifications**

July 2019

**7. Date of Programme Approval by the Academic Council of MSRUAS****8. Next Review Date**

2021

**9. Programme Approving Regulatory Body and Date of Approval**

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**10. Programme Accrediting Body and Date of Accreditation**

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**11. Grade Awarded by the Accreditation Body**

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**12. Programme Accreditation Validity**

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**13. Programme Benchmark**

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#### 14. Rationale for the Programme

The PG programme in Food science & technology deals with food Science, food processing, food safety, food quality, food product storage, preservation, packaging and distribution.

M.Sc. in Food Science and Technology is a postgraduate degree programme designed to develop motivated graduates to fill the roles of food scientists, research associates, food quality control/quality assurance officers, administrators, professors, professionals, independent practitioners and entrepreneurs.

Indian economy is experiencing an upward growth. The average GDP growth rate is varying from 6.5 to 9%. India has around 630 million youth below 25 years of age, who seek employment in various field. With changing life style and culture, processed food has started gaining momentum. This Industry provides a plethora of opportunities to build a carrier or become an entrepreneur.

A large number of youth in the age group of 25 with a science degree are considering food technology programme for career prospects. RUAS, a young and progressive University has been offering a B.Sc. (Hons.)- Food processing and technology since 2018 and would like to offer M.Sc. in Food Science and Technology as a Postgraduate programme to these aspiring youngsters.

Government of India has set up three Mega food parks in Karnataka State and few more in pipe line. These food parks have been established with view of creating more than ten thousand jobs each across the value chain. In view of this, RUAS, a young and progressive University started UG course titled B.Sc. (Hons.) Food Processing and Technology in 2018 to develop well trained professional for food Industry. However, UG courses to a large extent help in developing man power suitable for operations /process management. This creates a void in skilled personal suitable for research, new product development or process development. Hence this proposal to start a postgraduate course (M.Sc. in Food Science and Technology) to meet the requirement of food sector in Karnataka state.

The M.Sc. in Food Science and Technology programme has been developed based on interactions with various universities, research establishments and industries in India and abroad.

The curriculum is outcome based and it imbibes required theoretical concepts and practical skills in the domain. By undergoing this programme, students develop critical, analytical thinking and problem solving abilities for a smooth transition from academic to real-life work environment. Opportunities are provided for the students to execute a well-defined project in organizations involved in research & development and also to enhance practical skills and problem solving abilities. The students are required to submit a well written project report as partial fulfilment for the award of the degree, which will help develop skills of documenting scientific work.

In addition students are trained in communication skills and interdisciplinary topics to enhance their scope. The various new features like undergoing internship and executing a full-fledged academic/ Industry project in the programme make the students more versatile and providing opportunities to pursue Ph.D. The programme embeds requisite knowledge and training for a graduate to become an entrepreneur as well.

The above mentioned features of the programme, advanced teaching and learning resources, and experience of the faculty members with their strong network with industry and research organizations makes this programme unique.

### 15. Programme Mission

The purpose of the programme is to develop knowledgeable human resources to work in Government, Private and Public sector owned Food Technology and Food Processing organisations and also to assume research and administration positions. With further progression in education, graduates should be able to undertake teaching and research in colleges and universities as well as in scientific organisations.

### 16. Graduate Attributes

1. Ability to apply fundamental knowledge of Biology, Biochemistry, Food Chemistry, Food Microbiology for developing food products and preservation.
2. Ability to develop technologies for food processing and preservation
3. Ability to develop processes for food product development
4. Ability to test food for quality, safety and nutrition
5. Ability to develop packaging for preservation and distribution
6. Ability to perform administrative duties in government, semi-government, private and public sector organizations
7. Ability to teach in schools, colleges and universities with additional qualification and training
8. Ability to understand and solve scientific problems by conducting experimental investigations
9. Ability to apply appropriate tools, techniques and understand utilization of resources appropriately in various laboratories
10. Ability to understand the effect of scientific solutions on legal, cultural, social and public health and safety aspects
11. Ability to develop sustainable solutions and understand their effect on society and environment
12. Ability to apply ethical principles to scientific practices and professional responsibilities
13. Ability to work as a member of a team, to plan and to integrate knowledge of various disciplines and to lead teams in multidisciplinary settings
14. Ability to make effective oral presentations and communicate technical ideas to a broad audience using written and oral means
15. Ability to adapt to the changes and advancements in science and engage in independent and life-long learning

### 17. Programme Goal

The programme acts as a Master's degree and helps to develop critical, analytical and problem solving skills. The Master's degree makes the graduates employable in food technology and food processing industries and also to assume, research, product development and administrative positions in various types of organisations. Graduates who aspire to make a career in academics and high end research can opt to pursue PhD.

## 18. Programme Objectives

The Master of Science PG degree programme in Food Science and Technology imparts knowledge and understanding of Biology, Biochemistry, Food Chemistry, Food Microbiology, Food Science, Food processing, Food safety, Food quality, Food product storage, Food product preservation, Food product packaging and Food product distribution.

The Programme also provides sufficient understanding and cognitive abilities to design and develop technologies for food processing, preservation and packaging as per the legal and safety requirements. In addition, the programme imparts knowledge and training to develop carry out research, transferable skills and entrepreneurship abilities.

The objectives of the programme are to enable the students to:

1. To impart knowledge of Food-Biochemistry, Food Chemistry and Food Microbiology
2. To impart knowledge and understanding of technology of vegetables, fruits, plantation crops, meat, poultry, dairy and sea foods, bakery and confectionery.
3. To impart abilities to design technologies for food processing and food preservation
4. To impart abilities to design and develop food packaging and distribution
5. To train students on use of various instrumentation for the evaluation of food quality and safety
6. To train students to conduct scientific experiments and document scientific investigations
7. To educate on professional ethics, economics, social sciences, inter personal and communication skills relevant to professional practice
8. To provide a general perspective on lifelong learning and opportunities for a career in industry, scientific organization, education, business and commerce

## 19. Intended Learning Outcomes of the Programme

The Intended Learning Outcomes (ILOs) are listed under four headings:

1. Knowledge and Understanding, 2. Cognitive Skills 3. Practical Skills and 4. Capability / Transferable Skills.

### 1. Knowledge and Understanding

After undergoing this programme, a student will be able to:

- KU1:** Analyse and explain with illustrations chemical, biochemical and microbiological phenomenon as applied to food processing and preservation
- KU2:** Analyse and apply various food processing, preservation and packaging technologies
- KU3:** Discuss the importance of food quality, safety and nutrition and Implement the same
- KU4:** Assess technologies of vegetables, fruits, cereals, millets, plantation crops, meat, poultry, dairy products, sea foods, bakery and confectionery

### 2. Cognitive Skills

After undergoing this programme, a student will be able to:

- CS1:** Design technologies for food processing and food preservation
- CS2:** Design and develop food packaging and distribution
- CS3:** Apply various instrumentation for the evaluation of food quality and safety
- CS4:** Conduct scientific experiments and document scientific investigations

### 3. Practical Skills

After undergoing this programme, a student will be able to:

- PS1:** Choose appropriate instrumentation system for testing and evaluation of food products
- PS2:** Operate machines and systems that process and package food
- PS3:** Develop new food products
- PS4:** Assess quality and safety of food products

### 4. Capability / Transferable Skills

After undergoing this programme, a student will be able to:

- TS1:** Manage information, develop scientific reports and make presentations
- TS2:** Build, Manage and Lead a team to successfully complete a project and Communicate across teams and organizations to achieve professional objectives
- TS3:** Work under various constraints to meet project targets
- TS4:** Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

**20. Programme Delivery**

As per Time Table

**21. Programme Structure****SEMESTER 1**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19FST501A	Food Processing and Packaging	3		2	4	125
2	19FST502A	Food Additives and Preservatives	3		2	4	125
3	19FST551A	Biochemistry	2		2	3	100
4	19FST503A	Food Microbiology	3		2	4	125
5	19FST504A	Food Chemistry	3		2	4	125
6	19FST555A	Enzymes in Food Processing	3			3	100
<b>Total</b>			<b>17</b>		<b>10</b>	<b>22</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>27 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>18</b>	<b>Maximum</b>	<b>22</b>	

**SEMESTER 2**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19FST505A	Nutraceuticals and Functional Foods	3		2	4	125
2	19FST506A	Food Quality & Sensory Analysis	3		2	4	125
3	19FST553A	Food Production and Operations Management	3			3	100
4	19FST507A	Baking and Confectionery Technology	3		2	4	125
5	19FST508A	Advances In Fermentation Technology	3		2	4	125
6	19FST554A	Research Methodology	3			3	100
<b>Total</b>			<b>18</b>		<b>8</b>	<b>22</b>	<b>700</b>
<b>Total number of contact hours per week</b>			<b>26 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>18</b>	<b>Maximum</b>	<b>22</b>	

**SEMESTER 3**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19FST5XXA	Refer Elective Table	3		2	4	100
2	19FST5XXA	Refer Elective Table	3		2	4	100
3	19FST598A	Innovation and Entrepreneurship	3		-	3	100
4	19FST599A	Group Project			20	10	100
<b>Total</b>			<b>9</b>		<b>24</b>	<b>21</b>	<b>400</b>
<b>Total number of contact hours per week</b>			<b>33 hours</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>9</b>	<b>Maximum</b>		<b>21</b>

**SEMESTER 4**

S. No.	Code	Course Title	Theory (h/W/S)	Tutorials (h/W/S)	Practical (h/W/S)	Total Credits	Max. Marks
1	19FST600A	Dissertation & Publication				25	300
2							
<b>Total</b>						<b>25</b>	<b>300</b>
<b>Total number of contact hours per week</b>			<b>30 h</b>				
<b>Number of credits can be registered</b>			<b>Minimum</b>	<b>-</b>	<b>Maximum</b>		<b>-</b>
<b>Total Number of Credits in M.Sc. Programme</b>			<b>90</b>		<b>Total Marks</b>		<b>2100</b>

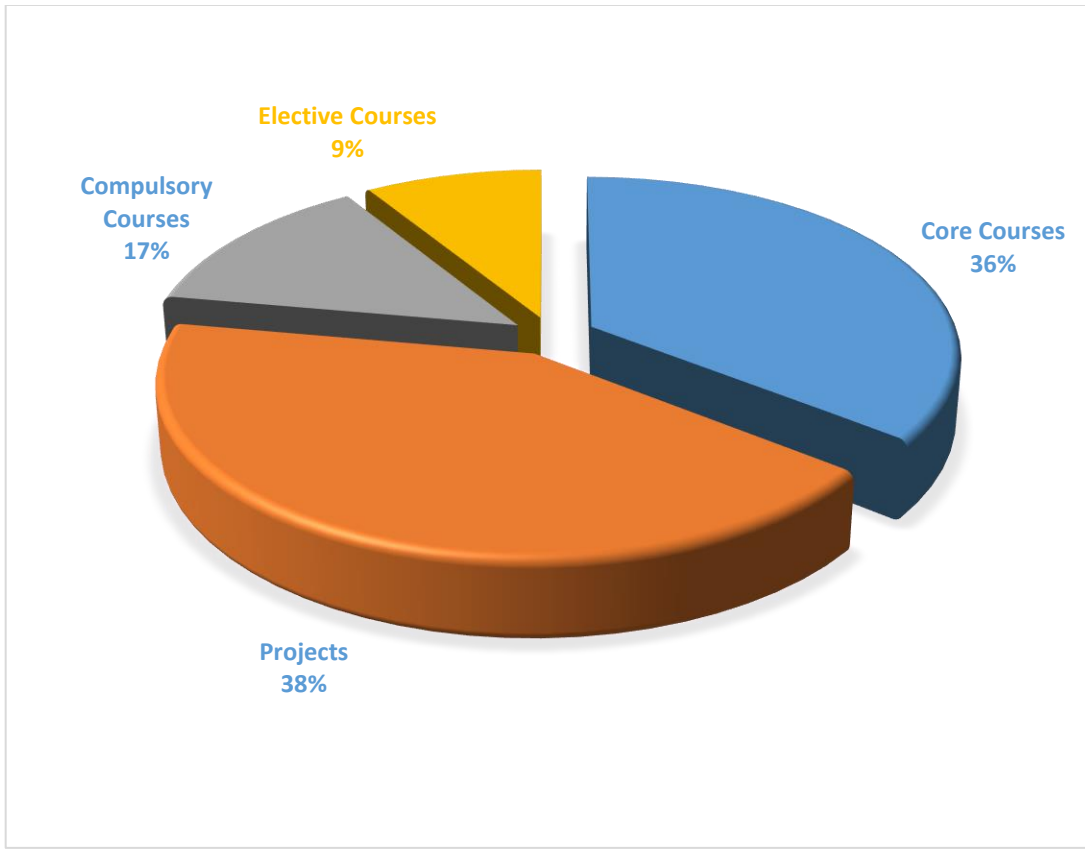
Sl. No.	Course Code	Elective Courses -1	Credits
1	19FST521A	Post-Harvest Technology of Cereals & Pulses	3+1
2	19FST531A	Millet Processing Technology	3+1
3	19FST541A	Fruits and Vegetable Processing Technology	3+1
4	19FST551A	Spices and Flavour Technology	3+1
Sl. No.	Course Code	Elective Courses -2	Credits
1	19FST522A	Advances in Dairy Processing	3+1
2	19FST532A	Dairy Microbiology	3+1
3	19FST542A	Dairy Engineering	3+1
4	19FST552A	Dairy Food Packaging	3+1



## Proposed Choice Based Credit System Structure for M.Sc. Food Science and Technology

M.Sc. in Food Science and Technology				Total Credits : 90			Programme Duration: 2 years		Credits	
<b>Core Courses (M)</b>	<b>19FST501A</b> Food Processing Packaging <b>Credits = 4</b>	<b>19FST502A</b> Food Additives and Preservatives <b>Credits = 4</b>	<b>19FST503A</b> Food Microbiology <b>Credits = 4</b>	<b>19FST504A</b> Food Chemistry <b>Credits = 4</b>	<b>19FST505A</b> Nutraceuticals and Functional Foods <b>Credits = 4</b>	<b>19FST506A</b> Food Quality & Sensory Analysis <b>Credits = 4</b>	<b>19FST553A</b> Food Production and Operations Management <b>Credits = 4</b>	<b>19FST508A</b> Advances In Fermentation Technology <b>Credits = 4</b>	<b>32</b>	
<b>Projects (GP &amp; DP)</b>	<b>19FST599A</b> Group Project <b>Credits = 10</b>	<b>19FST600A</b> Dissertation & Publication <b>Credits =28</b>							<b>35</b>	
<b>Compulsory Courses (CM)</b>	<b>19FST551A</b> Biochemistry <b>Credits = 3</b>	<b>19FST552A</b> Enzymes in Food Processing <b>Credits = 3</b>	<b>19FST507A</b> Baking and Confectionery Technology <b>Credits = 3</b>	<b>19FST554A</b> Research Methodology <b>Credits = 3</b>	<b>19FST598A</b> Innovation and Entrepreneurship <b>Credits = 3</b>				<b>15</b>	
<b>Elective (E)</b>	<b>19FST5XXA</b> Elective -1 <b>Credits = 4 (E-1)</b>	<b>19FST5XXA</b> Elective -2 <b>Credits = 4 (E-1)</b>							<b>8</b>	
M: 32credits , CM : 12credits , DSE: 38credits, E: 8credits (= 90 credits)									<b>Total Credits</b>	<b>90</b>

**M.Sc. Food Science and Technology Credit Distribution (Total 90 Credits)**



Type of Course	Credits	%
Core Courses (M)	32	36
Projects (GP & DP)	35	38
Compulsory Courses (CM)	15	17
Elective (E)	8	9
<b>Total</b>	<b>90</b>	<b>100</b>

## 22. Teaching and Learning Methods

The Course delivery comprises of a combination of few or all of the following:

1. Face to face lectures using audio-visuals
2. Workshops-group discussions, debates, presentations
3. Demonstrations
4. Guest lectures
5. Laboratory-work/Field work/Workshop
6. Industry visit
7. Seminars
8. Group Exercises
9. Project Work
10. Project Exhibitions
11. Technical Events

## 23. Assessment and Grading

1. A four credit course will be assessed for a weight of 125 and Three credit course for 100
2. Evaluation will have two components:
  - a. **Theory:**  
Component-1(CE): 50% weightage (Term Test, Assignment and Seminar); Course leader shall decide the evaluation pattern  
Component-2 (SEE): 50% weightage Semester End written Examination
  - b. **Laboratory:**  
Component-1(CE): 40% weightage Conduction of Laboratory Exercises and Submission of Report  
Component-2 (SEE): 60% weightage Semester End Laboratory Examination
3. A minimum of overall 40% is required for a pass
4. The marks for each course is given in the programme structure
5. Other flexibilities (exceptions) are as per the Academic Regulations of M.Sc. programme.

## 24. Attendance

A minimum of 75% attendance is required to be eligible for SEE.

## 25. Award of Class

As per the Academic Regulations for M.Sc. -Food Science and Technology Programme

**26. Student Support for Learning**

Students are given the following support:

1. Course notes
2. Reference books in the library
3. Magazines and Journals
4. Internet facility
5. Computing facility
6. Laboratory facility
7. Workshop facility
8. Staff support
9. Lounges for discussions
10. Any other support that enhances their learning

**27. Quality Control Measures**

Following are the Quality Control Measures:

1. Review of course notes
2. Review of question papers and assignment questions
3. Student Feedback
4. Moderation of assessed work
5. Opportunities for the students to see their assessed work
6. Review by external examiners and external examiners reports
7. Staff Student Consultative Committee meetings
8. Student exit feedback
9. Subject Assessment Board (SAB)
10. Programme Assessment Board (PAB)

## 28. Curriculum Map

Course Code	Intended Learning Outcomes											
	Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving)				Practical skills			
	KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4
19FST501A		X		X		X						
19FST502A	X	X		X				X				
19FST551A	X											
19FST503A	X											
19FST504A	X						X	X				
19FST552A	X						X	X				
19FST505A				X				X				
19FST506A	X	X	X	X		X	X		X			X
19FST553A				X								
19FST507A			X	X				X				
19FST508A	X	X	X					X				
19FST554A		X		X				X				
19FST5XXA		X	X	X								
19FST5XXA		X	X	X								
10FST599A		X	X	X	X		X	X	X		X	
10FST600A	X	X	X	X	X	X		X	X	X		

**29. Capability / Transferable Skills Map**

Course Code	Skills								
	GK	SL	WC	OC	P	B	IM	PM	L
19FST501A		x	x	X	x	x			
19FST502A		x	x	X	x	x			
19FST551A		x	x	X	x	x			
19FST503A		x	x	x	x	x			
19FST504A		x	x	x	X	x			
19FST555A		x	x	x	X	x			
19FST505A		x	x	x	X	x			
19FST506A		x	x	X	x	x			
19FST553A		x	x	X	x	x			
19FST507A		x	x	X	x	x			
19FST508A		x	x	X	x	x			
19FST554A		x	x	X	x	x			
19FST5XXA		x	x	X	x	x			
19FST5XXA		x	x	x	x	x			
10FST599A	x	x	x	x	x	x	x	x	X
10FST600A		x	x	x		x	X	X	

*GK: Group Work; SL: Self Learning; WC: Written Communication; OC: Oral Communication P: Presentation; B: Behavioural; IM: Information Management; PM: Personal Management L: Leadership*

**30. Co-curricular Activities**

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities to enhance their knowledge and network.

**31. Cultural and Literary Activities**

To remind and ignite the creative endeavours, annual cultural festivals are held and the students are enabled to plan and organize the activities.

**32. Sports**

Students are encouraged to develop a habit of taking part in outdoor and indoor games on regular basis.

