Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY
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વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
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ક્રમાંક :ઓથો./પરિપત્ર/૪૧૫૭/૨૦૨૫
તા.૧૩/૦૨/૨૦૨૫

પ્રતિ,
વડાશ્રી,
બાયોટેકનોલોજી ડિપાર્ટમેન્ટ,
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી,
સુરત.

વિષયઃ– શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવનાર B.Sc. Food Technology સેમેસ્ટર–૧ અને ૨ ના અભ્યાસક્રમ બાબત.

સુજ્ઞશ્રી,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવનાર B.Sc. Food Technology સેમેસ્ટર–૧ અને ૨ ના અભ્યાસક્રમ બાબતે બાયોટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા.૨૯/૦૧/૨૦૨૫ ની સભાના ઠરાવ ક્રમાંકઃ૦૪ થી નીચે મુજબ કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણને એકેડેમિક કાઉન્સિલની તા.૧૧/૦૨/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંકઃ૫૧ થી સ્વીકારી મંજુર કરેલ છે, જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

<u>બાયોટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા.૨૯/૦૧/૨૦૨૫ ની સભાના ઠરાવ ક્રમાંકઃ૦૪</u>

:: આથી ઠરાવવામાં આવે છે કે, બાયોટેકનોલોજી વિભાગમાં શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવનાર B.Sc. Food Technology સેમેસ્ટર–૧ અને ૨ નો આ સાથે સામેલ અભ્યાસક્રમ મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

<u>એકેડેમિક કાઉન્સિલની તા.૧૧/૦૨/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંકઃ ૫૧</u>

:: આથી ઠરાવવામાં આવે છે કે, ડિપાર્ટમેન્ટ ઓફ બાયોટેકનોલોજી વિભાગમાં શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવનાર B.Sc. Food Technology સેમેસ્ટર–૧ અને ૨ ના અભ્યાસક્રમ બાબતે બાયોટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા.૨૯/૦૧/૨૦૨૫ ની સભાના ઠરાવ ક્રમાંકઃ૦૪ થી કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાવતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ સ્વીકારી મંજૂર કરવામાં આવે છે.

(બિડાણઃ ઉપર મુજબ)

કુલસચિવ(ઇ/ા)

પ્રતિ,
૧) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા,
૨) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....જાણ સારૂ.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

PROPOSAL to Start New Program at Department of Biotechnology

Bachelor of Science (B. Sc.) Program in

Food Technology

[3 years (Degree) & 4 years (Honours/Honours with Research)]

Program Overview: The B. Sc. in Food Technology is an innovative undergraduate program that provides a multidisciplinary understanding of food, blending science, technology, and culture. The program explores the essence of food in human life while emphasizing laboratory skills, industrial training and research. Students gain access to food science, innovation and development through practical exposure.

Key Areas of Focus:

1. Cultural Beliefs and Scientific Rationale: Linking traditional food-related practices and beliefs with scientific principles.
2. Fundamentals of Food Chemistry: Understanding the physical, chemical, and biological makeup of food.
3. Food and Human Physiology: Examining the connection between food types, human physiology and dietary requirements across life stages and seasons.
4. Food Microbiology: Studying the role, growth patterns, and identification of microorganisms, including their benefits and harmful effects.
5. Food Containment and Applications in Food Science: Learning about food processing, preservation, safety and quality control techniques in the dairy and food industry.
6. Technological Advancements: Exploring modern tools and technologies in food production, packaging and storage.
7. Sustainability in Food Systems: Addressing global challenges like food security, environmental sustainability and waste reduction.

Eligibility for Admissions:

Eligibility: 12th pass from Science (A, B & AB), Commerce or Arts stream.
Seats/Intake: 30 Students (01 Division/Class)
Fees: Rs. 30,000/- per semester.
[Recognizing the diverse academic backgrounds of aspiring students, the program includes a Bridge Course of 2 Credits (30 Hours) for Commerce, Science and Arts students to build fundamental scientific knowledge in biological and chemical science and to strengthen them in key concepts of accounts and entrepreneurship. This ensures a seamless transition into the core curriculum, promoting an inclusive and multidisciplinary approach as per NEP 2020.]

Student Support Services:

Career Guidance: Regular workshops and industry interactions for employability and skill development.
Internships: Industry-linked training programs to provide real-world exposure.
Mentorship: Dedicated faculty mentoring to address academic and personal growth.

Pedagogical Approach: The program employs a modern and engaging teaching methodology to offer a holistic learning experience. Active learning techniques, such as problem-based learning, case studies and concept mapping, are integrated to enhance practical understanding and student participation. Cutting-edge technology, including food analysis software, simulation tools and AI-driven data analytics, is incorporated to keep students abreast of advancements in the field.
An interdisciplinary curriculum design links food chemistry, microbiology, nutrition, engineering and sensory science, encouraging cross-disciplinary projects to address global challenges like sustainable food systems. A student-centric approach focuses on personalized learning pathways and collaborative projects, enabling students to explore areas like food safety, functional foods and entrepreneurship.

Program Specific Outcomes (PSO):

- ✓ **PSO-01:** Foundational Knowledge-Understand and recall fundamental concepts of food science to develop academic, industrial and professional competence.
- ✓ **PSO-02:** Analytical Thinking-Analyse and evaluate food-related industrial and environmental challenges using scientific approaches.
- ✓ **PSO-03**: Multidisciplinary Integration-Apply knowledge from various scientific fields to adapt to evolving global trends in food technology.
- ✓ **PSO-04:** Innovation-Create and implement sustainable solutions for food processing, safety, and nutrition to benefit society.
- ✓ **PSO-05:** Ethics and Leadership-Demonstrate integrity, professional ethics and teamwork in academic and industrial settings.
- ✓ **PSO-06:** Problem-Solving-Develop research-based, solution-driven approaches to address food science and technology challenges.
- ✓ **PSO-07:** Skill Development-Apply hands-on training in modern tools and techniques essential for food industry applications.
- ✓ **PSO-08:** Career Readiness-Engage in internships, industry visits, and entrepreneurial learning to enhance employability in academia, research, and industry.

Learning Objectives:

- ✓ **Scientific Reasoning**: Train graduates in food systems and scientific principles to address industry challenges, innovate products and ensure food safety.
- ✓ **Collaboration**: Develop teamwork, leadership and project management skills for interdisciplinary environments.
- ✓ **Analytical Skills**: Employ advanced tools like gas chromatography and spectrophotometry for food analysis and quality assurance.
- ✓ **Ethical Practices**: Promote adherence to food laws, sustainability and intellectual property respect.
- ✓ **Innovation**: Encourage creative solutions for consumer preferences, industry demands, and regulatory compliance.

Existing Teaching Staff:

The department is well-equipped with a team of highly qualified and experienced faculty members who are capable of providing quality education and training to students of the Food Technology program. The robust team of teaching staff ensures a strong foundation for the successful implementation of the Food Technology program by leveraging their expertise across various domains of Microbiology, Biochemistry, Biotechnology, Biosciences, Plant Science, Animal Science and allied fields.

Existing Laboratory Facilities and Instruments:

The department is fully equipped with laboratories and instruments essential for initiating the Food Technology Program from the academic year 2025-2026. The facilities include equipment such as a like Laminar Air Flow, Autoclave, Bacteriological Incubator, and Orbital Shaker with Incubator ensures robust practical training in microbial and biochemical analyses, which are critical for food technology studies. Additionally, department also have Inverted Microscope, U.V.-Vis Spectrophotometer, Digital pH Meter, Gel Documentation System, Cooling Centrifuge, Theprmocycler, ELISA Microplate Reader, and Quick Freezer (-20°C) to support advanced experiments and research in future. This infrastructure positions the Department of Biotechnology to provide comprehensive education and practical exposure in the field of Food Technology.

Justification: The B. Sc. Food Technology program is designed to align with global trends and address the ever-evolving challenges of the modern world, contributing significantly to societal progress. By fostering a culture of innovation and sustainability—key pillars of the Department of Biotechnology, VNSGU, Surat—the program equips students with the skills and knowledge needed to create impactful solutions in food processing, safety, quality assurance, and sustainable food production. The program emphasizes the integration of cutting-edge research, technological advancements, and sustainable practices, ensuring that graduates are well-prepared to drive meaningful change in the food industry while upholding environmental and societal responsibility.

Conclusion: The B. Sc. Food Technology program at VNSGU is structured to provide comprehensive theoretical and practical training, preparing students for careers in food manufacturing, quality control, product development, regulatory affairs and research. With required laboratory facilities, experienced teachers and an industry-driven curriculum, students will develop technical expertise, critical thinking and problem-solving abilities. By integrating modern food science techniques, research-driven learning and hands-on training, the program fosters career readiness and entrepreneurial skills in Food Technology. The inclusion of a Bridge Course ensures that students from Commerce, Arts and Science streams can effectively adapt to the interdisciplinary nature of the program, making it an inclusive, future-ready and impactful academic offering in line with our National Education Policy 2020.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B. Sc. Program in Food Technology-Major

Teaching & Evaluation Scheme Semester-I & II

[Academic Year of Implementation 2025-2026]

Semester - I

Course Code	Course Title	Teaching Schedule Hours/Week	Exam Duration & Marks			Total Theory/Practical Marks	Credit
			Duration (Hours)	(CCE) Internal Marks	(SEE) External Marks		
FT-MJ-101	Food & Health: Bhartiya Heritage	3h	1:30h	37	38	70	3
FTP-MJ-101	Practical	2h	3h	12	13	25	1
FT-MJ-102	Introduction to Food Science & Technology	3h	1:30h	37	38	75	3
FTP-MJ-102	Practical	2h	3h	12	13	25	1
			Total	**98**	**102**	**200**	**8**

Semester - II

Course Code	Course Title	Teaching Schedule Hours/Week	Exam Duration & Marks			Total Theory/Practical Marks	Credit
			Duration (Hours)	(CCE) Internal Marks	(SEE) External Marks		
FT-MJ-201	Ayurveda in Modern Food Science	3h	1:30h	37	38	70	3
FTP-MJ-201	Practical	2h	3h	12	13	25	1
FT-MJ-202	Molecular Food Composition I	3h	1:30h	37	38	75	3
FTP-MJ-202	Practical	2h	3h	12	13	25	1
			Total	**98**	**102**	**200**	**8**

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Semester-I: Course: FT-MJ-101: Food and Health: Bhartiya Heritage

Course Code	FT-MJ-101
Course Title	**Food and Health: Bhartiya Heritage**
Credit	3
Total engagement	3 Credits x 15 Hours = 45 Hours
Teaching per week	3 h
Minimum weeks per semester	15 weeks (Including classwork, examination, preparation & holidays)
Effective from	2025-2026
Purpose of Course	This course introduces students to the rich heritage of food and health in Bhartiya (Indian) culture. It aims to explore ancestral knowledge, traditional food philosophies and their relevance to modern food technology and health sciences. Students will gain an appreciation of the interconnection between food, environment and health as understood in Bhartiya heritage and its potential applications in sustainable and holistic living.
Course Objectives	• To develop an understanding of the linguistic, cultural and historical aspects of food in Indian heritage. • To explore the relationship between climate, crops and prehistory with food practices and agricultural developments in India. • To familiarize students with the principles of Ayurveda, ancient texts on food, and their recommendations for healthy living. • To appreciate the scientific foundations and practical applications of traditional Indian food systems in modern health and nutrition.
Course Outcomes	CO1: Students will understand the linguistic, cultural and philosophical heritage of Indian food, focusing on Satvic principles and their health benefits. CO2: Students will explore the link between climate, agriculture, and prehistory, appreciating the role of crops and the Harappan Civilization in shaping Indian food culture. CO3: Students will grasp Ayurveda food principles and ancient texts, understanding the integration of food and medicine for holistic health.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1								
CO2								
CO3								

Pre-requisite	12th Pass from Science, Commerce & Arts Stream	
Course Content	**UNIT-1: Ancestral Legacies:** Language and food; Words for food in Sanskrit; Important words and its meaning from a historical dictionary of Indian food; Indian words in foreign language; Satvic Food	Teaching Hours: 15

	Philosophy; Definition and 4 Satvic Food Principles; 21 Satvic Food Laws; Understanding Digestion.	
	UNIT-2: Climate, Crops and Prehistory: The Physical Environment; The Climate; The development of Agriculture: Pulses, Grains, Fruits and Vegetables, Spices; The Harappan Civilization.	Teaching Hours: 15
	UNIT-3: Food and Medicine: Introduction; The Principles of Ayurveda; Food Prescription: Susruta Samhita; Food and Beverage pairings by Susruta; Healthy eating recommendations by Charaka.	Teaching Hours: 15
Reference Books	✓ Sen, C. T. (2016) *Feast and Fast: A History of Food in India*, Speaking Tiger, Chaman Enterprises, New Delhi (ISBN: 978-93-85755-34-7) ✓ Achaya, K. T. (2024) *A Historical Dictionary of Indian Food*, Oxford University Press, New Delhi (ISBN-10: 0-19-565868-X). ✓ Jain Subah (2022) *The Food Book*, Satvik Movement (ISBN-10: 9354935087). ✓ Achaya, K. T. (2021) *Indian Food*, Oxford India Paperbacks, New Delhi (ISBN-13: 978-0-19-564416-6)	
e-learning resources	✓ https://youtu.be/XiQOoS0MQA8?si=nJIhhl765kGXKmQm ✓ https://youtu.be/Cl1Ua8TCDmo?si=C-AxqRNRMsB-gO3f ✓ https://youtu.be/mKHF_cP-XeE?si=rLmSLr7VZ3xJfM-E ✓ https://youtu.be/Cl1Ua8TCDmo?si=6rs4P9QuAmLz7l_z	
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment	
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
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Semester-I: Course: FTP-MJ-101: Practical

Course Code	FTP-MJ-101
Course Title	**Practical : Food and Health: Bhartiya Heritage**
Credit	1
Total Engagement	1 Credit x 30 Hours = 30 Hours
Teaching per week	2 h X 1 day = 2 h
Minimum weeks per semester	15 weeks (Including Laboratory work, examination, preparation, holidays etc.)
Effective from	2025-2026
Purpose of Course	This course aims to integrate Indian heritage into food science by exploring historical, cultural, and Ayurvedic perspectives on food and health. It provides students with practical exposure to ancient dietary principles, agricultural practices, and the scientific evaluation of traditional foods.
Course Objectives	• To understand the linguistic and historical significance of Indian food traditions. • To explore and analyse Satvic dietary principles and their nutritional benefits. • To study the relationship between crops, climate and agriculture in India. • To investigate the role of Ayurveda herbal preparations in health and wellness. • To simulate and evaluate digestion processes using traditional foods.
Course Outcomes	CO1: Students will gain an understanding of the cultural and historical significance of Indian food terms, appreciating their evolution and relevance in modern dietary practices. CO2: Students will learn to prepare Satvic dishes as per traditional principles and evaluate their nutritional benefits, gaining insights into their role in promoting health and wellness. CO3: Students will develop an understanding of how climate and geography influence crop distribution in India, with a focus on traditional agricultural practices. CO4: Students will explore Ayurveda herbal remedies, understanding their preparation, sensory properties, and potential health benefits, bridging traditional knowledge with modern applications. CO5: Students will learn about digestion processes and the impact of traditional food preparation techniques on nutrient availability and overall health.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO 1-5								

Pre-requisite	12th Pass from Science, Commerce & Arts Stream

Course Content	1. Study of Indian Food Terminology and Historical Context. 2. Preparation and Analysis of Satvic Foods. 3. Mapping of Crops and Climatic Adaptations in Indian Agriculture. 4. Study of Ayurvedic Herbal Preparations in Food. 5. Digestion Simulation Using Traditional Foods.
Reference Books	✓ Achaya, K. T. (2003) *The Illustrated Foods of India: A Historical Companion*. Oxford University Press. ✓ Lad, V. (2002) *Ayurveda: The Science of Self-Healing*. Lotus Press. ✓ Pole, S. (2013) *Ayurvedic Medicine: The Principles of Traditional Practice*. Singing Dragon. ✓ Jain, V. (2016) *Handbook of Agriculture*. Indian Council of Agricultural Research (ICAR). ✓ Paroda, R. S. (2004) *Sustaining Our Food Security*. ICAR. ✓ Dash, B., & Sharma, R. K. (2002). *Charaka Samhita: Text with English Translation*. Chaukhamba Sanskrit Series Office. ✓ Gopalan, C., Rama Sastri, B. V., & Balasubramanian, S. C. (1989) *Nutritive Value of Indian Foods*. National Institute of Nutrition, ICMR. ✓ Swaminathan, M. (1985) *Essentials of Food and Nutrition*. The Bangalore Printing and Publishing Co. Ltd.
Teaching Methodology	Laboratory work, Journal preparation
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Semester-I: Course: FT-MJ-102 Introduction to Food Technology

Course Code	FT-MJ-102
Course Title	**Introduction to Food Technology**
Credits	3
Total Engagement	3 Credits x 15 Hours = 45 Hours
Teaching per week	3 hours
Minimum weeks Per semester	15 weeks
Course level	100-199
Effective from	2025-2026
Purpose of Course	The purpose of the course "Introduction to Food Technology" is to provide foundational knowledge about the science and practices involved in food production, processing, and preservation. It covers the social and scientific aspects of food, key terms and concepts in food technology, and the historical development of the food industry.
Course Objective	The objectives of the "Introduction to Food Technology" course are to provide a comprehensive understanding of food science, including its social and scientific aspects. Students will learn about key nutrients, food processing, and preservation techniques, along with the historical development and current trends in the food industry. The course aims to equip students with foundational knowledge essential for understanding food quality, safety, and technology.
Course Outcomes	Upon completion of the Introduction to Food Technology Course, students will: CO1: Students will gain an understanding of food from both social and scientific viewpoints, along with key terms in food technology. They will also explore the historical development of food technology, current industry trends, and factors influencing food acceptability. CO2: Students will be able to classify and understand the role of essential nutrients in human health, including carbohydrates, proteins, fats, vitamins, minerals, and water. They will gain knowledge of the nutritional significance of each nutrient and its impact on the body's functions and overall well-being. CO3: Students will be able to identify various food processing methods and understand their applications. They will gain an understanding of the principles and importance of food preservation and explore different methods used to maintain food safety, quality, and shelf life.

Mapping between Cos with PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO 1-10								

Pre-requisite	12th Pass from Science, Commerce & Arts Stream	
Course Content	**UNIT-1 FUNDAMENTALS OF FOOD TECHNOLOGY** What is food - socially and scientifically? Various terms used in food technology, Introduction to Food Technology as discipline, Historical development and current trends, Characteristics of Food Industry, Acceptability of food.	Teaching Hours: 15

	UNIT-2 NUTRIENTS IN FOOD Classification of nutrients, Carbohydrates & Proteins, Fats, Vitamins, Minerals, Water	Teaching Hours: 15
	UNIT-3 FOOD PROCESSING AND PRESERVATION TECHNOLOGIES Food Processing Methods, Food Preservation: Importance & Principle, Methods of Food Preservation	Teaching Hours: 15
Reference Books	✓ Mudambi, S. R., Rao, S. M., & Rajagopal, M. V. (2015). *food Science*. New Age International. ✓ Srilakshmi, B. (2003). *Food science*. New Age International. ✓ Potter, N. N., & Hotchkiss, J. H. (2012). *Food science*. Springer Science & Business Media.	
e-learning resources	✓ https://www.researchgate.net/publication/367083176_Historical_Developments_in_Food_Science_and_Technology	
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment Laboratory work, Journal preparation	
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
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Semester-I: Course: FTP-MJ-102: Practical

Course Code	FTP-MJ-102
Course Title	**Practical: Introduction to Food Technology**
Credits	1
Total Engagement	1 Credits x 30 Hours = 30 Hours
Teaching per week	2 hours
Minimum weeks Per semester	15 weeks
Course level	100-199
Effective from	2025-2026
Purpose of Course	The purpose of these practical's is to equip students with essential skills in food analysis and technology. By working with laboratory equipment, preparing reagents, and determining the nutritional content of food samples, students will gain practical experience in food testing.
Course Objective	The practical's aim to provide hands-on experience with essential food technology techniques. Students will learn to properly use laboratory equipment, prepare reagents, and determine the carbohydrate and protein content in food samples.
Course Outcomes	Upon completion of the Introduction to Food Technology Practical Course, students will CO1: Students will gain proficiency in using and handling laboratory equipment essential for food technology experiments. CO2: Students will develop the ability to prepare accurate and standardized reagents for food analysis. CO3: Students will learn to apply methods to analyze carbohydrate content in food samples. CO4: Students will be able to determine the protein content in food using different techniques. CO5: Students will acquire skills in performing sensory evaluations to assess food quality based on consumer preferences.

Mapping between Cos with PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO 1-5								

Pre-requisite	12th Pass from Science, Commerce & Arts Stream
Course Content	1. To Study Laboratory Equipment & their Usage. 2. To Study Protocol for Preparation of Reagents. 3. To Determine Total Carbohydrate of Food sample. 4. To Determine Protein Content in Food. 5. Sensory Evaluation of Food Products.
Reference Books	✓ Mudambi, S. R., Rao, S. M., & Rajagopal, M. V. (2015). *food Science*. New Age International. ✓ Srilakshmi, B. (2003). *Food science*. New Age International. ✓ Potter, N. N., & Hotchkiss, J. H. (2012). *Food science*. Springer Science & Business Media.
e-learning resources	✓ https://www.researchgate.net/publication/329699625_Estimation_of_protein_by_biuret_method ✓ https://ncert.nic.in/pdf/publication/sciencelaboratorymanuals/classXII

	/chemistry/lelm111.pdf
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment Laboratory work, Journal preparation
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Semester-II: Course: FT-MJ-201 Ayurveda in Modern Food Science

<table>
<tr><td>Course Code</td><td colspan="2">FT-MJ-201</td></tr>
<tr><td>Course Title</td><td colspan="2">Ayurveda in Modern Food Science</td></tr>
<tr><td>Credits</td><td colspan="2">3</td></tr>
<tr><td>Course Level</td><td colspan="2">100-199</td></tr>
<tr><td>Total engagement</td><td colspan="2">3 Credits x 15 Hours = 45 Hours</td></tr>
<tr><td>Teaching per week</td><td colspan="2">3 h</td></tr>
<tr><td>Minimum weeks per semester</td><td colspan="2">15 weeks (Including classwork, examination, preparation & holidays)</td></tr>
<tr><td>Effective from</td><td colspan="2">2025-26</td></tr>
<tr><td>Purpose of Course</td><td colspan="2">This course will provide students with a comprehensive understanding of the integration of Ayurveda principles with modern food science promoting overall health and wellness.</td></tr>
<tr><td>Course Objectives</td><td colspan="2">This course aims to equip students with the knowledge and skills necessary to apply Ayurveda concepts in the context of contemporary nutrition and food therapeutics.</td></tr>
<tr><td>Course Outcomes</td><td colspan="2">CO1: To introduce students to the history and principles of Ayurveda.
CO2: To explore the concept of diet in Ayurveda, including the classification of foods & dietary guidelines
CO3: To examine the intersection of Ayurveda and modern food science, focusing on food-based therapeutics and the scientific validation</td></tr>
<tr><td>Mapping between COs with PSOs</td><td colspan="2">
<table>
<tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td><td>PSO6</td><td>PSO7</td><td>PSO8</td></tr>
<tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Pre-requisite</td><td colspan="2">12th Pass from Science, Commerce & Arts Stream</td></tr>
<tr><td>Course Content</td><td>UNIT-1: History and Principles of Ayurveda.
Ayurveda-First Life Science & Human Potential, Five elements and man-man as microcosm, Human constitution-Understanding Tridosha, Vata constitution, Pitta constitution, Kapha constitution.</td><td>Teaching Hours: 15</td></tr>
<tr><td></td><td>UNIT-2: Concept of Diet in Ayurveda.
Food and its Healing process, Food-its properties and qualities, Compatibility and Incompatibility, General dietary guidelines, General concept of dining in Ayurveda.</td><td>Teaching Hours: 15</td></tr>
<tr><td></td><td>UNIT-3: Food based Therapeutics: Ayurveda and Modern Science.
Introduction, Food as antioxidants, Food based Therapeutics (Garlic, Ginger, Nutmeg, Onion, Black pepper, Chili, Red pepper, Tamarind, Turmeric, Star anise, Tulsi, Curry leaf, Bitter gourd, Lotus, Grapes), Medicated food.</td><td>Teaching Hours: 15</td></tr>
</table>

Reference Books	✓ Lad, V. (1984). *Ayurveda: The Science of Self-Healing*. Lotus Press ✓ Morrison, J. H. (1995). *The Book of Ayurveda: A Holistic Approach to Health and Longevity*. Simon & Schuster Inc. ✓ Rastogi, S. (2014). *Ayurvedic Science of Food and Nutrition*. Springer.
e-learning resources	www.carakasamhitaonline.com
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Semester-II: Course: FTP-MJ-201: Practical

Course Code	FTP-MJ-201
Course Title	**Practical : Ayurveda in Modern Food Science**
Credits	1
Course Level	100-199
Total engagement	1 Credits x 30 Hours = 30 Hours
Teaching per week	2h
Minimum weeks per semester	15 weeks (Including classwork, examination, preparation & holidays)
Effective from	2025-26
Purpose of Course	The course aims to bridge the gap between traditional Ayurvedic practices and contemporary scientific techniques, enabling students to develop practical skills and a deeper understanding of the integration of these two fields.
Course Objectives	To provide hands-on experience, application of theoretical knowledge in identifying, preparing Ayurvedic functional foods and understanding their health benefits.
Course Outcomes	CO1: To identify and document various Ayurvedic herbs and spices used in traditional medicine. CO2: To assess Prakriti, and create a meal plan following Ayurvedic dietary guidelines. CO3: To create awareness about *virudh* foods and prevent complications. CO4: To prepare common Ayurvedic formulations and understand their therapeutic benefits. CO5: To gain practical application of Ayurvedic principles in patient care and treatment.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1								
CO2								
CO3								
CO4								
CO5								

Pre-requisite	12th Pass from Science, Commerce & Arts Stream	
Course Content	1. Identify and document uses of various Ayurvedic herbs and spices used in traditional medicine. 2. Plan a balanced Ayurvedic diet based on individual Prakriti using a chart. 3. List combination of incompatible foods and mention their scientific reason. 4. Preparation of Ayurvedic formulation (Triphala Churna/Turmeric Milk/Herbal Tea) and document the therapeutic uses of it. 5. Visit to an Ayurvedic center/hospital/herbal garden.	Teaching Hours: 30

Reference Books	✓ Lad, V. (1984). *Ayurveda: The Science of Self-Healing*. Lotus Press ✓ Lad, U., & Lad, V. (1997). *Ayurvedic Cooking for Self-Healing*. The Ayurvedic Press. ✓ Morrison, J. H. (1995). *The Book of Ayurveda: A Holistic Approach to Health and Longevity*. Simon & Schuster Inc. ✓ Rastogi, S. (2014). *Ayurvedic Science of Food and Nutrition*. Springer.
e-learning resources	www.carakasamhitaonline.com
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Semester-II: Course: FT-MJ-202: Molecular Composition of Food-I

<table>
<tr><td>Course Code</td><td colspan="3">FT-MJ-202</td></tr>
<tr><td>Course Title</td><td colspan="3">Molecular Composition of Food-I</td></tr>
<tr><td>Credits</td><td colspan="3">3</td></tr>
<tr><td>Course Level</td><td colspan="3">100-199</td></tr>
<tr><td>Total engagement</td><td colspan="3">3 Credits x 15 Hours = 45 Hours</td></tr>
<tr><td>Teaching per week</td><td colspan="3">3 h</td></tr>
<tr><td>Minimum weeks per semester</td><td colspan="3">15 weeks (Including classwork, examination, preparation & holidays)</td></tr>
<tr><td>Effective from</td><td colspan="3">2025-26</td></tr>
<tr><td>Purpose of Course</td><td colspan="3">The purpose of the Molecular Composition of Food course is to explore the chemical properties and structures of essential food components. It aims to provide students with a deep understanding of how these molecules influence food quality, processing, and nutritional value.</td></tr>
<tr><td>Course Objectives</td><td colspan="3">The aim is to provide students with the knowledge and skills to analyze the chemical structures and functions of key food components. It aims to enhance understanding of how molecular properties impact food processing, preservation, and overall quality</td></tr>
<tr><td>Course Outcomes</td><td colspan="3">CO1: Understand the molecular composition and chemical properties of key food components, including water, carbohydrates, and lipids, and their roles in food quality, texture, and nutrition.
CO2: Analyse the influence of water activity, carbohydrate types, and lipids on food spoilage, preservation, and processing methods such as frying, hydrogenation, and emulsification.
CO3: Apply knowledge of food chemistry to practical food processing techniques, including water binding in meat, lipid oxidation, and the use of emulsifiers in food products</td></tr>
<tr><td>Mapping between COs with PSOs</td><td colspan="3"><table><tr><th></th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th><th>PSO6</th><th>PSO7</th><th>PSO8</th></tr><tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Pre-requisite</td><td colspan="3">12th Pass from Science, Commerce & Arts Stream</td></tr>
<tr><td>Course Content</td><td>Unit 1: Introduction to Food Chemistry
What is food chemistry? History of food chemistry, Water, Freezing and Ice Structure, Water Activity and Food Spoilage, Water Activity and Packaging, Water Binding of Meat, Water Activity and Food Processing</td><td>Teaching Hours: 15</td></tr>
<tr><td></td><td>Unit 2: Carbohydrates
Introduction, Monosaccharides, Related Compounds, Oligosaccharides, Polysaccharides, Dietary Fibre</td><td>Teaching Hours: 15</td></tr>
</table>

	Unit 3: Lipids Classification, Unsaponifiable, Autoxidation, Photo oxidation, Heated Fats – Frying, Flavour Reversion, Hydrogenation, Interesterification, Fractionation, Cocoa Butter and Confectionery Fats, Emulsions and Emulsifiers	Teaching Hours: 15
Reference Books	✓ Fennema, O. R., Damodaran, S., & Parkin, K. L. (2007). Introduction to food chemistry. In *Fennema's Food Chemistry* (pp. 13-28). CRC Press. ✓ Belitz, H. D., Grosch, W., Schieberle, P., Belitz, H. D., Grosch, W., & Schieberle, P. (2004). *Food chemistry*.	
e-learning resources	✓ https://onlinecourses.swayam2.ac.in/cec20_ag10/preview ✓ https://elearning.icar.gov.in/eLearning_ContentDisplayUG.aspx?CourseCode=lRSZJqz2ljOe67w9qtsOuA==&CourseName=OdcisqqlKapSqbvXGQkQWf48goLsiUwCXfqXtpCSsQg= ✓ https://elearning.icar.gov.in/UserLogin.aspx ✓ http://ecoursesonline.iasri.res.in/mod/page/view.php?id=3971	
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment	
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Semester-II: Course: FTP-MJ-202: Practical

Course Code	FTP-MJ-202
Course Title	**Practical : Molecular Composition of Food-I**
Credits	1
Course Level	100-199
Total engagement	1 Credits x 30 Hours = 30 Hours
Teaching per week	2h X 1 day = 2 h
Minimum weeks per semester	15 weeks (Including classwork, examination, preparation & holidays)
Effective from	2025-26
Purpose of Course	This course aims to equip students with practical skills in analyzing key food components. It focuses on determining moisture content using techniques like the hot air oven and Karl Fischer method, isolating starch, estimating reducing sugars, and assessing oil saponification. These methods provide foundational knowledge for food quality and safety evaluation
Course Objectives	This course aims to familiarize students with analytical techniques for evaluating food composition and quality. It focuses on methods like moisture analysis, starch isolation, reducing sugar estimation, and saponification value determination. The objective is to build essential skills for food quality control and research applications.
Course Outcomes	CO1: Demonstrate proficiency in determining the moisture content of solid and liquid foods using the hot air oven and Karl Fischer methods. CO2: Isolate starch from food samples and explain its role in food products. CO3: Accurately estimate reducing sugars in various food samples using standard techniques. CO4: Evaluate the saponification value of oils to assess their quality and applications. CO5: Apply analytical skills in food quality testing, ensuring safety and innovation in food science.
Mapping between COs with PSOs	<table><tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td><td>PSO6</td><td>PSO7</td><td>PSO8</td></tr><tr><td>CO1-5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>
Pre-requisite	12th Pass from Science, Commerce & Arts Stream
Course Content	1. Determination of moisture content by hot air oven. 2. Determination of moisture content of liquid food by karl Fischer method. 3. Isolation of starch from food 4. Estimation of reducing sugar in food. 5. Determination of saponification of oil Teaching Hours: 30
e-learning resources	✓ https://www.researchgate.net/publication/281182948_Evaluation_of_Air_Oven_Moisture_Content_Determination_Procedures_for_Pearl_Millet_Pennisetum_glaucum_L ✓ https://onlinelibrary.wiley.com/doi/abs/10.1002/9780470027318.a8102
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment

Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Bridge Course (BC): Fundamentals of Accounting & Entrepreneurship*

<table>
<tr><td>Course Code</td><td colspan="3">FT-BC-01</td></tr>
<tr><td>Course Title</td><td colspan="3">Fundamentals of Accounting & Entrepreneurship</td></tr>
<tr><td>Credits</td><td colspan="3">2</td></tr>
<tr><td>Course Level</td><td colspan="3">100-199</td></tr>
<tr><td>Total engagement</td><td colspan="3">2 Credits x 15 Hours = 30 Hours</td></tr>
<tr><td>Teaching per week</td><td colspan="3">2 h</td></tr>
<tr><td>Minimum weeks per semester</td><td colspan="3">15 weeks (Including classwork, examination, preparation & holidays)</td></tr>
<tr><td>Effective from</td><td colspan="3">2025-26</td></tr>
<tr><td>Purpose of Course</td><td colspan="3">To provide science students with a foundational understanding of commerce, management, and entrepreneurship.</td></tr>
<tr><td>Course Objectives</td><td colspan="3">The course aims to equip students with the essential knowledge and skills required to navigate the world of business and commerce, bridging the gap between their science background and the fundamentals of commerce.</td></tr>
<tr><td>Course Outcomes</td><td colspan="3">CO1: Students will develop skills in performing basic accounting processes and to apply the principles of management in planning and controlling business activities.
CO2: Students will develop an entrepreneurial mind-set and understand the characteristics and roles of entrepreneurs & will develop proficiency in solving business mathematics problems</td></tr>
<tr><td>Mapping between COs with PSOs</td><td colspan="3"><table><tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td><td>PSO6</td><td>PSO7</td><td>PSO8</td></tr><tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Pre-requisite</td><td colspan="3">12th Pass from Science, Commerce & Arts Stream</td></tr>
<tr><td>Course Content</td><td>UNIT-1: Basics of Accounting & Management
Meaning and scope of accounting, accounting concepts, principles, and conventions, accounting terminology: Capital, revenue, expenditure, receipts, Journal, ledger, trial balance, Final accounts: Profit and loss account, balance sheet. Definition and importance of management, Functions of management: Planning, organizing, staffing, directing, controlling, Levels of management: Top, middle, and lower levels.</td><td>Teaching Hours: 15</td></tr>
<tr><td></td><td>UNIT-2: Entrepreneurship & Business Mathematics
Definition and characteristics of an entrepreneur, Types of entrepreneurs, Role of entrepreneurship in economic development, Steps in business planning, SWOT analysis, Business strategies for growth and sustainability
Ratio and proportion, Time value of money: Simple interest, compound interest, Arithmetic and geometric progression.</td><td>Teaching Hours: 15</td></tr>
<tr><td>Reference Books</td><td colspan="3">✓ NCERT Class 11 and 12 Commerce Textbooks
✓ Gupta, C.B., & Khanka, S.S. (2014). Entrepreneurship and Small Business Management. Sultan Chand & Sons.
✓ Maheshwari, S.N., & Maheshwari, S.K. (2018). An Introduction to Accountancy. Vikas Publishing House.</td></tr>
</table>

	✓ Koontz, H., & Weihrich, H. (2010). *Essentials of Management: An International Perspective*. McGraw-Hill Education. ✓ Bose, D. (2017). *Business Mathematics and Statistics*. S. Chand Publishing.
e-learning resources	www.ocw.mit.edu
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination

***To be approved by Board of Studies (BoS) in Commerce including Business Administration**

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Undergraduate Program in Food Technology (B. Sc.)
(3 Years Degree; 4 Years Honours/Honours with Research)

Bridge Course (BC): Basics of Biology

<table>
<tr><td>Course Code</td><td colspan="2">FT-BC-02</td></tr>
<tr><td>Course Title</td><td colspan="2">Basics of Biology</td></tr>
<tr><td>Credits</td><td colspan="2">2</td></tr>
<tr><td>Course Level</td><td colspan="2">100-199</td></tr>
<tr><td>Total engagement</td><td colspan="2">2 Credits x 15 Hours = 30 Hours</td></tr>
<tr><td>Teaching per week</td><td colspan="2">2 h</td></tr>
<tr><td>Minimum weeks per semester</td><td colspan="2">15 weeks (Including classwork, examination, preparation & holidays)</td></tr>
<tr><td>Effective from</td><td colspan="2">2025-26</td></tr>
<tr><td>Purpose of Course</td><td colspan="2">To provide commerce students with a foundational understanding of living world, biomolecules and human physiology.</td></tr>
<tr><td>Course Objectives</td><td colspan="2">This course aims to provide foundational knowledge in biology, bridging the gap between their science background and the fundamentals of commerce.</td></tr>
<tr><td>Course Outcomes</td><td colspan="2">CO1: Students will be able to describe the fundamental concepts of biology, including the meaning of living organisms, the diversity of life forms, and the chemical composition of biomolecules. They will understand of the process involved in the evolution of life forms and the analysis of primary and secondary metabolites, macro, and micro biomolecules. They will develop the ability to explain the structure and functions of human tissues, including epithelial, connective, muscle, and nervous tissues, and their roles in maintaining homeostasis.
CO2:Students will be able to describe the processes of human digestion, absorption, and excretion, including urine formation, kidney function regulation, and common disorders of the digestive and excretory systems.</td></tr>
<tr><td>Mapping between COs with PSOs</td><td colspan="2"><table><tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td><td>PSO6</td><td>PSO7</td><td>PSO8</td></tr><tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Pre-requisite</td><td colspan="2">12th Pass from Science, Commerce & Arts Stream</td></tr>
<tr><td>Course Content</td><td>UNIT-1: Introduction to Biology
Meaning of Living, Diversity in the living World, origin of life, Evolution of life forms- A Theory, Analysis of chemical Composition of Biomolecules, Primary and Secondary Metabolites, Macro biomolecules, Micro biomolecules.
Types of Tissues: Epithelial Tissues, Connective Tissue, Muscle Tissue, Nervous Tissue</td><td>Teaching Hours: 15</td></tr>
<tr><td></td><td>UNIT-2: Human Digestion and Excretion
Digestion and Absorption, Disorder of digestive systems, Excretory System, Urine Formation, Function of tubules, Mechanisms of concentration of filtrate, Regulation of Kidney function, Role of other organ in Excretion, Disorders of Excretory system.</td><td>Teaching Hours: 15</td></tr>
<tr><td>Reference Books</td><td colspan="2">✓ NCERT Class 11 and 12 Science Textbooks</td></tr>
</table>

	✓ Satyanarayana, U. (2013). *Biochemistry*. Elsevier Health Sciences. ✓ Fulton, J. (1879). *A Text book of physiology*. Lindsay & Blakiston. ✓ Pollard, T. D., Earnshaw, W. C., Lippincott-Schwartz, J., & Johnson, G. (2022). *Cell Biology E-Book: Cell Biology E-Book*. Elsevier Health Sciences.
e-learning resources	✓ https://onlinecourses.nptel.ac.in/noc22_bt17/preview ✓ https://www.coursera.org/courses?query=biology
Teaching Methodology	Classwork, Discussion, Self-Study, Projects, Seminars and/or Assignment
Evaluation Method	50% CCE: Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. 50% SEE: External assessment based on semester end University examination