VANITA VISHRAM WOMEN'S UNIVERSITY
(Managed By: Vanita Vishram, Surat)
1st Women's University of Gujarat

SCHOOL OF SCIENCE AND TECHNOLOGY

FACULTY OF SCIENCE

DEPARTMENT OF FOOD AND NUTRITION

B.Sc. Food and nutrition

SYLLABUS

As per NEP-2020

w.e.f 2024-25

INDEX

1. Preamble – VVWU

Vanita Vishram Women's University (VVWU) is the First-ever Women's University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a University committed to achieve Women's Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical component and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in the society.

MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

2. Salient Features

Based on NEP-2020 & CBCS

- Interdisciplinary as well as multidisciplinary.
- Practical-oriented, skill-based & vocation-based.
- Based on experiential learning.
- Greater exposure to internship, hands-on training, project work, field work, presentation etc.
- Mode of teaching shall be Offline
- Qualified & Competent Faculty Members for effective teaching-learning
- Employment-Generating

3. Introduction of the Program

It is a three-year undergraduate course offered after completion of 10+2 schooling. Food & Nutrition is concerned with the field of Science and in this course, the main emphasis is given to food, nutrition, diet and their production, management, preservation, etc. The Bachelor of Science course in Food and Nutrition focuses on the interface between Human Nutrition and Food Science as well as an integration of the two disciplines. The course aims to provide broad and balanced knowledge in Food and Nutrition in addition to understanding of key chemical concepts, principles and theories. It will provide knowledge and skill to the students' thus enabling them to undertake further studies in Food and Nutrition, in related areas or multidisciplinary areas that can be helpful for self-employment / entrepreneurship. The course is designed to provide intellectual and laboratory skills according to the UGC module for CHOICE BASED CREDIT SYSTEM (CBCS) pertaining to B.Sc. Food and Nutrition.

4. Objective of the program

The primary objective of a Food and Nutrition program is to equip students with the skills and knowledge necessary for careers in the food industry and entrepreneurship.

- Introduce the students to the advanced aspects of Nutrition Science and Dietetics.
- Make them understand the role as a Nutritionist or a dietitian in preventive and therapeutic aspects of Health care management.
- Develop skills wherein they understand the role of various foods, nutrients they provide and imply innovative methods in food product development.
- Create awareness among them about the current and future trends in the industry and help to determine food safety and entrepreneurship.
- Create awareness about the need for Nutrition in Community emphasizing the role of Public Health Nutrition.

5. Programme Objectives (PO_s)

PO 1. To impart knowledge of biological sciences and application of biological systems in day-to-day life that are technological aspects.

PO 2. To strengthen the in-field practical knowledge of the students by providing them hands-on experimentation, project work and field work.

PO 3. To develop capability of thinking, understanding/analyzing and interpreting and solving problems to meet the need of industries such as agriculture, food and dairy, fermentation, diagnostics, pharma industries, etc. and research.

PO 4. To make learners understand about bioethical aspects, safety aspects and their responsibilities towards mankind and the environment.

PO 5. To make students capable of finding entrepreneurship opportunities for betterment of society, environment.

PO 6. To make the students ready for competitive examinations related to Life & Biosciences.

6. Program Specific Outcomes (PSO_s)

Upon completion of the B.Sc. Biotechnology/B.Sc. (Hons) Biotechnology program, the students would:

PSO 1. Have the knowledge of basic Biology and Biotechnological aspects; its understanding, concept.

PSO 2. Be able to apply their practical skills and knowledge to identify and resolve the problems related to and serve various Biotechnological Industries such as agriculture, food and dairy, environmental, fermentation, diagnostics, pharma industries, etc, Medical or hospital related organizations, Regulatory Agencies, Environmental problems & Academia.

PSO 3. Be able to use modern analytical tools/ software/ equipment's and analyze the results used in industry and research through an inter-disciplinary learning habitat.

PSO 4. Be able to practice professional ethics in Food and Nutrition and Execute their professional careers in society as Dietitian, Nutritionist, Research assistant, Food lab technician, Public health expert, Food inspector, Food Entrepreneur, Wellness consultants, Diet counselor, Diabetes educator, fitness coach, Sports Nutritionist, Researcher.

PSO 5. Develop high-quality research encouraging scientific thinking and approach for research.

PSO 6. Develop skills for further higher studies, competitive examinations and employment.

7. Program Highlights:

Course Level	UG						
Duration	3 years (6 Semesters)						
Examination Type	Semester system (1-6 semesters)						
Intake	100						
Eligibility	10 + 2 Open Eligibility						
Mapping between POs and PSOs		PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.	PSO 6.
	PO 1.						
	PO 1.						
	PO 1.						
	PO 1.						
	PO 1.						
Job Positions	Dietitian, Nutritionist, Research assistant, Food lab technician, Public health expert, Food inspector, Food Entrepreneur, Wellness consultants, Diet counselor, Diabetes educator, sports Nutritionist, Researcher						

8. Scheme of Assessment

Following is the scheme of assessment followed by the university:

Weightage (%)	Continuous Comprehensive Evaluation (CCE) (50%)	Semester End Evaluation (SEE) (50%)
100%	• [Internal written Exam] **(20%)** • [Thread-01 + Thread-02] **(10% + 10%)** (Any 2 of the following) [**1**. Assignments/ **2**. Project work/ **3.** Field work/ **4.** Quiz/ **5.**Group discussion/ **6.** Role play/ **7.** (Lab Record/Lab Performance/Lab Work)/ **8.** (Seminar/Class Performance/ Poster Presentation)/ **9.** Viva-Voice/ **10.** Book Review or Article Review/ **11.** Case Studies/ **12.** Class Test/ **13.** Report Writing/ **14.** Any other as per the requirement of the subject] • [Attendance] **(10%)**	Semester End Evaluation (SEE) Theory Exam Whole Syllabus

9. Credit Structure

B.Sc. Food and Nutrition Credit structure for UG – 2023									
According to Curriculum and Credit Framework for Undergraduate Program									
Semester	**Major**	**Minor**	**Multi-Disciplinary**	**Ability Enhancement Course (AEC)**	**Skill Enhancement Course (SEC)**	**Value Added Courses (VAC)/IKS**	**RP/OJT**	**Dissertation**	**Total**
1	8	4	4	2	2	2	0	0	22
2	8	4	4	2	2	2	0	0	22
3	12	0	4	2	2	2	0	0	22
4	12	4	0	2	2	2	0	0	22
5	12	8	0	0	2	0	0	0	22
6	12	4	0	2	4	0	0	0	22
Total	**64**	**24**	**12**	**10**	**14**	**8**	**0**	**0**	**132**
7	12	4	0	0	0	0	6	0	22
8	12	4	0	0	0	0	6	0	22
Total	**24**	**8**	**0**	**0**	**0**	**0**	**12**	**0**	**44**
Grand Total	**88**	**32**	**12**	**10**	**14**	**8**	**12**	**0**	**176**
* If anyone wants to exit after 2nd/ 4th Sem and wants a certificate/Diploma respectively, should complete an internship of 4 credits (60 hrs.)									

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DEPARTMENT OF FOOD AND NUTRITION

B.Sc. FOOD AND NUTRITION

SEMESTER 3

SYLLABUS

As per NEP-2020

w.e.f 2024-25

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10. Course Structure – Paper Titles SEMESTER 3

UG Course structure for year – 2023									
Sem	**Major**	**Minor**	**Multi-Disciplinary**	**Ability Enhancement Compulsory (AEC)**	**Ability Enhancement Elective – Skill based (SEC)**	**Value Added Courses (VAC)**	**Summer Internship/ Project/ Online Course**	**Dissertation**	**Total**
3	Principles of Micronutrients Food Science-II Community Nutrition	NA	Holistic Wellness	Communication kills-I	Life Skills	Indian Knowledge System: Vigyan	- - 	- - 	22

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- **11. Teaching and Evaluation Scheme for BSC Food and Nutrition Academic Year 2023-24**

Semester	Course Code	Course Category	Course Title	Offering Department	Teaching Scheme				Examination Scheme													
					Contact Hour			Total Credit	Theory						Practical						Total Marks	Total Credits
					Theory	Practical	Total		Credit	CCE		SEE		CCE+SEE Passing Max	Credit	CCE		SEE		CCE+SEE Passing		
										Max.	Passing	Max.	Passing			Max.	Passing	Max.	Passing			
3	FNM205-2C	Discipline Specific Course (Major)	Principles of Micronutrients	Food and Nutrition	3	0	3	3	3	35	13	35	13	26	0	0	0	0	0	0	70	3
		Discipline Specific Course (Major) - Practical	Principles of Micronutrients	Food and Nutrition	0	2	2	1	0	0	0	0	0	0	1	15	6	15	6	12	30	1
	FNM206-2C -	Discipline Specific Course (Major)	Food Science-II	Food and Nutrition	3	0	3	3	3	35	13	35	13	26	0	0	0	0	0	0	70	3
		Discipline Specific Course (Major) - Practical	Food Science-II	Food and Nutrition	0	2	2	1	0	0	0	0	0	0	1	15	6	15	6	12	30	1
	FNM207-2C	Discipline Specific Course (Major)	Community Nutrition	Food and Nutrition	3	0	3	3	3	35	13	35	13	26	0	0	0	0	0	0	70	3

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		Discipline Specific Course (Major) - Practical	Community Nutrition	Food and Nutrition	0	2	2	1	0	0	0	0	0	0	1	15	6	15	6	12	30	1
	MDC203-2C	Inter-disciplinary/ Multidisciplinary Courses	Holistic Wellness	Food and Nutrition	4	0	4	4	4	50	18	50	18	36	0	0	0	0	0	0	100	4
	AEC203-2C	Ability Enhancement Course (AEC)			2	0	2	2	2	25	9	25	9	18	2	25	9	25	9	18	50	2
	SEC203-2C	Skill Enhancement Courses (SEC)			2	0	2	2	2	25	9	25	9	18	2	25	9	25	9	18	50	2
	IKS202-2C	Value Added Courses (VAC)			2	0	2	2	2	25	9	25	9	18	2	25	9	25	9	18	50	2
				TOTAL	16	12	28	22	22	275	99	275	99	198	22	200	72	200	72	144	550	22

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SY B.Sc.
Semester III
FNM205-2C:Principles of Micronutrients (Th)

Credit 3 **Contact Hour per week 3**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	Principles of Micronutrients
Course Objective	CO 1. To understand the micronutrients, their functions and their metabolic utilization. CO 2. To learn about micronutrients, their sources,types, needs and deficiency. CO 3. To understand the processes of digestion, absorption, and transport. CO 4. To gain knowledge about nutrient deficiencies or excesses based on principles of micronutrient
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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Department of Food and Nutrition
B. Sc Food & Nutrition Program
FNM205-2C:Principles of Micronutrients (Th)

Course Content

Units	Particulars	% Weightage of Unit	Hours
1	**Fat-Soluble vitamins- A, D, E, K** ● Composition- precursor, requirements, Sources, Functions and deficiency / toxicity, Role in health.	30	14
2	**Water-Soluble Vitamins- B and C** ● Composition- precursor, requirements, Sources, Functions and deficiency / toxicity, Role in health.	20	12
3	**Macro Minerals: (Calcium, Phosphorus, Magnesium, Chloride, Potassium, Sodium and Sulfur)** ● Composition- precursor, requirements, Sources, Functions and deficiency / toxicity, Role in health. (Calcium, Phosphorus and Sodium should be discussed in detail. Overview of the rest should be given)	30	10
4	**Micro Minerals: (Iron, Zinc, Copper, Iodine, Fluoride, Chromium, Cobalt, Selenium, Manganese)** ● Composition- precursor, requirements, Sources, Functions and deficiency / toxicity, Role in health. (Iron should be discussed in detail. Overview of the rest should be given)	20	09

REFERENCE

Core references:

Reference books

1. "The Vitamin Book: The Complete Guide to Vitamins, Minerals, and the Most Effective Herbal Remedies and Dietary Supplements" (2006) by Harold M. Silverman and Joseph A. Romano.
2. Understanding Nutrition (2011), Whitney and Rolfes, 12th edition
3. Srilakshmi.B. Food Science, New age international Pvt. Ltd. New Delhi, 2001.
4. Gopalan, G. RamaShastri B.V &Balasuvramnian, S.C. (2000). Nutritive Value of Indian Foods. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad 500-007, India.
5. Swaminathan, M. (2009). Textbook of Food and Nutrition. Bappco publishers, Bangalore.

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	To understand the role of micronutrients in the body.

CO 2	To get in-depth knowledge about the sources, functions, and deficiency of micronutrients.
CO 3	To know the basis of energetic and nutritional equilibrium, and its regulation.
CO 4	To know deficiency and toxicity diseases of micronutrients .

FNM205-2C:Principles of Micronutrients (Th)

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	Fat Soluble Vitamins				
2	Water Soluble Vitamins				
3	Macro Minerals				
4	Micro Minerals				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						

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SY B.Sc.
Semester III
FNM205-2C: Principles of Micronutrients (Pr)

Credit 1 **Contact Hour per week 2**

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	Principles of Micronutrients
Course Objective	CO 1. To learn about the type of micronutrients, their functions and various food sources . CO 2. To plan various recipes of micronutrients by using various food groups. CO 3. To study the calculation of various micronutrients used for the body metabolic process.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Demonstration, performance.
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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FNM205-2C: Principles of Micronutrients (Pr)

Course Content

Practicals	Particulars	% Weightage of Unit	Hours
1	**Fat-Soluble vitamins- A** -Plan and prepare recipes rich in Vitamin A.	10	03
2	**Water-Soluble Vitamins- B and C** -Plan and prepare recipes rich in Vitamin B1,2,3,12 and C.	30	12
3	**Macro Minerals:** - Plan and prepare recipes rich in Calcium - Preparation of Sodium and Potassium exchange list - Preparation of recipes using salt alternatives.	25	08
4	**Micro Minerals:** - Plan and prepare recipes rich in Iron. - Discussion on improving bioavailability/ inhibiting factors of micro and macro minerals.	35	07

REFERENCES

Core references:

Reference books:

1. A Manual on Fundamentals of Food and Nutrition (2006) by Vanita Vishram and SNDT.
2. Srilakshmi.B. Food Science, New age international Pvt. Ltd. New Delhi, 2001.
3. Gopalan, G. RamaShastri B.V &Balasuvramnian, S.C. (2000). Nutritive Value of Indian Foods. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad 500-007, India.
4. National Institute of Nutrition (2017), Indian Food Composition Tables, ICMR.
5. National Institute of Nutrition (2020), Nutrient Requirements For Indians.
6. "Nutrition Stripped: 100 Whole-Food Recipes Made Deliciously Simple" by McKel Hill, MS, RDN

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FNM205-2C: Principles of Micronutrients (Pr)

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	To understand the concept of micronutrients in improved health and immunity.
CO 2	To determine the nutritive value of different recipes per serving.
CO 3	To learn the use of a food guide.
CO 4	To list rich sources of various nutrients, plan and prepare recipes.

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	**Fat-Soluble vitamins- A, D, E, K**				
2	**Water-Soluble Vitamins- B and C**				
3	**Macro Minerals:** - Calcium, Phosphorus, Magnesium - Preparation of Sodium and Potassium exchange list				
4	**Micro Minerals:** - Iron, Zinc, Copper, Iodine - Market survey on iodine fortified foods.				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						

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SY B.Sc.
Semester III
FNM206-2C: Food Science-II (Th)

Credit 3 **Contact Hour per week 3**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	Food Science-II (Th)
Course Objective	CO 1. Understand the composition, nutritive value, properties and processing of different food commodities including cereals, pulses, nuts, oilseeds, Fats, Oils, vegetables and fruits CO 2. Apply the knowledge of Difference between various methods of cooking and their significance. CO 3. Analyze the processing and its effect on Nutritional Content of different foods
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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FNM206-2C: Food Science-II (Th)

Course Content

Units	Particulars	% Weightage of Unit	Hours
1	**Nuts and Oilseeds** ● Composition and Nutritive Value of commonly used nuts and oilseeds. ● Specific nuts and oilseeds- almond, coconut, groundnut, walnut, gingelly seeds ● Introduction to exotic seeds-flaxseeds, garden cress, pumpkin, watermelon seeds ● Toxins ● Role of nuts and oilseeds in cookery	10	03
2	**Fats and Oils** ● Composition and Nutritive Value of various types of fats and oils. ● Characteristics of fats- plasticity, hydrogenation, winterisation, shortening, smoking point. ● Comparison of different types of oils (nutritional and cold pressed) ● Rancidity of fats and oils ● Role of fats and oils in cookery	20	12
3	**Sugar and its products** ● Nutritive Value and properties ● Sugar and related products- honey, jaggery, natural sugars. ● Characteristics of Sugar- caramelisation, crystallization ● Role of sugar in cookery ● Artificial Sweeteners (Market Survey)	10	08
4	**Eggs and Flesh foods** ● Structure, Composition and Nutritive Value ● Role of egg in cookery ● **Meat-** Classification, Composition and Nutritive Value. ● **Fish-** Classification, Nutritive Value, Selection	20	07
5	**Adulteration and Sensory Evaluation** ● Food adulteration- types of adulterants and rapid methods of detection.	30	

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	• Sensory evaluation- sensory characteristics of food, methods of sensory evaluation, types of sensory tests		

REFERENCES

Reference books:

1. Srilakshmi B, Food Science, New Age International Publishers, 6th Edition. 2018.
2. N. Shakuntala Manay, M Shadakshara Swamy, Foods Facts and Principles, New age international Publishers, 4 th Edition, 2020
3. Rick Parker, Miriah Pace, Introduction to Food Science and Food Systems, Cengage Publishers, 2 nd Edition. 2019
4. Swaminathan, M, Handbook of Food and Nutrition, The Bangalore Press, 5 th Edition. 2018
5. Sunetra Roday, Food Science and Nutrition, Oxford university Press, 3 rd Edition. 2018
6. Vijaya khader, Textbook of Food Science and Technology, ICAR Publishers, 2013

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	To understand the nutritive value of various food groups.
CO 2	To prepare and deliver effective presentations to food science and nutrition professionals and to the general public.
CO 3	Acknowledge about sensory properties of foods.
CO 4	Be aware about the technicalities and processing of different food products.

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	Nuts and Oilseeds				
2	Fats and Oils				
3	Sugar and its products				
4	Eggs and Flesh foods				
5	Adulteration and Sensory Evaluation				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6

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CO1						
CO2						
CO3						
CO4						

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SY B.Sc.
Semester III
FNM206-2C: Food Science-II (Pr)

Credit 1 **Contact Hour per week 2**

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	Food Science-II (Pr)
Course Objective	CO 1. To inculcate the values of entrepreneurship and that facilitates the food product development at the larger level. CO 2. Apply the knowledge of Difference between various methods of cooking and their significance. CO 3. Analyze the processing and its effect on Nutritional Content of different foods
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Demonstration and Practical performance.
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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FNM206-2C: Food Science-II (Pr)

Course Content

Practicals	Particulars	% Weightage of Unit	Hours
1	**Fats and oils** a. Estimation of oil or fat from the given food sample by Soxhlet apparatus method or Solvent extraction method. b. To estimate the fat absorption by various samples c. Rancidity, blending of oils	20	06
2	**Sugar cookery**- crystallization, stages of caramelization.	25	07
3	**Egg cookery** a. To study the effect of heat on eggs. b. Egg cookery- poached, half fry etc.	15	05
4	To detect adulteration with the Rapid Test method.	15	05
5	**To study the organoleptic tests for food evaluation.** a. Difference Test- paired comparison, Duo-Trio, Triangle b. Rating Tests- Ranking, Monadic, Two-sample, Multiple-sample, Hedonic, Numerical Scoring, Composite Scoring. c. Sensitivity Tests- sensitivity-threshold, dilution d. Descriptive Tests	25	07

REFERENCES

Reference books:

1. FSSAI Dart manual, 2011.
2. Srilakshmi B, Food Science, New Age International Publishers, 6th Edition. 2018.
3. Fennema, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996.

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FNM206-2C: Food Science-II (Pr)

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	To comprehend the various methods of food processing.
CO 2	To develop effective communication skills to convey sensory findings, interpret scientific data, and collaborate with stakeholders including food producers, regulatory agencies, and consumers.
CO 3	To identify the basic components of food, including additives, and contaminants.
CO 4	To interpret sensory data and understand how sensory attributes influence consumer acceptance and purchasing decisions

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	Estimation of oil or fat from the given food sample by Soxhlet apparatus method or Solvent extraction method.				
2	Sugar cookery- crystallization, stages of caramelization.				
3	To study the effect of heat on eggs.				
4	To detect adulteration with the Rapid Test method.				
5	To study the organoleptic tests for food evaluation.				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						

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SY B.Sc.
Semester III
FNM207-2C: Community Nutrition (Th)

Credit 3 **Contact Hour per week 3**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	Community Nutrition
Course Objective	CO 1. To Understand Community Nutrition Concepts. CO 2. To Assess the needs of Community Nutrition. CO 3. To design, implement, and evaluate community-based nutrition programs and interventions that address specific nutritional needs and promote health equity.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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B. Sc Food & Nutrition Program
FNM207-2C: Community Nutrition (Th)

Course Content

Units	Particulars	% Weightage of Unit	Hours
1	**Concept of Public Nutrition** ● Relationship between health and nutrition, role of public nutritionists in the health care delivery. ● Determinants of Health Status ● Indicators of Health (Vital statistics: Mortality and morbidity rates; Life expectancy) ● National Health Care Delivery System ● Primary Health Care of the Community	20	09
2	**Nutrition Intervention Programmes**: Objectives and its operation ● Integrated Child Development Services ● Anaemia Prophylaxis, Iodine and Vitamin A Prophylaxis Programme	20	12
3	**Supplementary Feeding Programs** ● Mid Day Meal Programme ● Other current Programs	30	10
4	**Nutritional Monitoring and Surveillance** ● Objectives and components of Nutrition Monitoring ● Nutrition Monitoring Programs in India (NNMB, NSSO, NFHS, DLHS, FNB) ● Nutrition Surveillance system, objectives, uses and its indicators	30	14

REFERENCE

Core references:

Reference books

1. Park & Park: Textbook of preventive and Social Medicine, Banarsidas, Bhanot Publication 1995.
2. Gopaldas, T. and Seshadri S (Eds) Nutritional Monitoring and Assessment, Delhi; Oxford University Press.
3. FAO, Annual on food and Nutrition Policy, 1970.
4. Sabarweal, B. Public Health and Nutritional care. Commonwealth publishers . New Delhi 1999.
5. Gibney M.J, Magaretts B.M, Kearney J.M and Lenore Arab 2004. Public Health
6. Nutrition, Blackwell Publishing Co., U.K.
7. National Plan of Action on Nutrition 1995. Food & Nutrition Board, Dept. of WCD, GOI.

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COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	To Understand Community Nutrition Concepts.
CO 2	To assess the needs of Community Nutrition.
CO 3	To design, implement, and evaluate community-based nutrition programs and interventions that address specific nutritional needs and promote health equity.
CO 4	To seek opportunities for continuing education, networking, and leadership to stay current with emerging trends.

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	Concept of Public Nutrition				
2	Assessment of Nutritional status by ABCD Method				
3	Nutritional Monitoring and Surveillance				
4	Nutrition Intervention Programmes				
5	Supplementary Feeding Programs				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						

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SY B.Sc.
Semester III
FNM207-2C: Community Nutrition (Pr)

Credit 1 **Contact Hour per week 2**

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	Community Nutrition
Course Objective	CO 1. To Understand Community Nutrition Concepts. CO 2. To Assess the needs of Community Nutrition. CO 3. To design, implement, and evaluate community-based nutrition programs and interventions that address specific nutritional needs and promote health equity.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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Course Content

Practicals	Particulars	% Weightage of Unit	Hours
1	**Anthropometric Measurement of infant**: Length, weight, circumference of chest, mid-upper arm circumference, precautions to be taken. **Comparison with norms and interpretation:** Weight for age, height for age, weight for height, Body Mass Index (BMI), Waist - Hip Ratio (WHR), Skin fold thickness. **Growth charts:** Plotting of growth charts, growth monitoring and promotion	30	10
2	**Biochemical Parameters:** To know various lab tests and biochemical profiles with normal values and its interpretation.	20	8
3	**Clinical assessment:** Signs and Symptoms of common nutrient deficiencies.	20	8
4	**Dietary Assessment:** Household food consumption data, 24 hours dietary recall, food diary, Weighment method, food frequency questionnaire.	30	10

REFERENCE

Core references:

Reference books:

1. Textbook of Human Nutrition second edition, Mahtab S. Bamji, N. Pralhad Rao
2. Community Nutrition Maternal & Child Nutrition, Minakshi Tripathi, Dr. Payal Jain, Prism Books (India, 2022)
3. Nutritional Assessment" by Robert D. Lee and David C. Nieman (2013)
4. "Modern Nutrition in Health and Disease" edited by A. Catharine Ross, Benjamin Caballero (2021).
5. "Public Health Nutrition: Principles and Practice" edited by Mark Lawrence and Tony Worsley, 2nd edition, (2019)
6. "Nutritional Epidemiology" by Walter Willett: 3rd edition, (2013)

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COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	To Understand Community Nutrition Concepts.
CO 2	To assess the needs of Community Nutrition.
CO 3	To design, implement, and evaluate community-based nutrition programs and interventions that address specific nutritional needs and promote health equity.
CO 4	To seek opportunities for continuing education, networking, and leadership to stay current with emerging trends.

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	Anthropometric Measurement of infant				
2	Biochemical Parameters				
3	Clinical assessment				
4	Dietary Assessment				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						

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Semester III
MDC203-2C : Holistic Wellness (Th)

Credit 4 **Contact Hour per week 4**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Multi-Disciplinary Course
Purpose of Course	Holistic Wellness
Course Objective	CO 1. To introduce the basic principles of nutrition in Ayurveda. CO 2. To link Ayurvedic nutrition with modern dietary practices for health. CO 3. To analyze basic tenets of traditional diets and health recipes. CO 4. To understand the contemporary food habits in everyday life.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2024
Pre-requisite	Nil
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

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MDC203-2C : Holistic Wellness (Th)

Course Content

Units	Particulars	% Weightage of Unit	Hours
1	Meaning, definition, theories and practice of all alternative therapies.	15	10
2	**Ayurveda**: Principles of Ayurveda- Doshas (Vata, Pitta, Kapha) ● Ayurvedic Diagnosis and Treatment ● Ayurvedic Nutrition and Diet ● Eating According to Your Dosha	25	12
3	**Traditional Chinese Medicine (TCM):** Principles of TCM, ● Yin and Yang, Five Elements Theory, Qi (Energy) Flow. **Acupuncture:** Techniques, Applications and Benefits.	25	13
4	**Mind-Body Therapies** ● Yoga ○ Types of Yoga and Their Benefits ○ Developing a Personal Practice ● Meditation ○ Various Meditation Techniques ○ Benefits for Mental and Physical Health ● Tai Chi ○ Principles and Practices ○ Health Benefits	15	10
5	**Naturopathy:** Principles of Naturopathy ● The Healing Power of Nature ● Treating the Whole Person Common Naturopathic Treatments	10	10
6	**Bodywork Therapies** ● Massage Therapy ○ Types of Massage (Swedish, Deep Tissue, etc.) ○ Benefits and Contraindications ● Reflexology ○ Principles and Techniques ○ Benefits and Applications	10	5
7	**Integrating Alternative Therapies into Daily Life** ● Creating a Personalized Wellness Plan ○ Setting Goals and Objectives ○ Selecting Appropriate Therapies ● Monitoring and Adjusting the Plan ● Combining Alternative and Conventional Therapies		
REFERENCE			
Core references:			

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Reference books:

1. Rastogi S {2014) Ayurvedic Science of Food and Nutrition. ASIN: BOOHWMV094, Springer: ISBN-13:978-1461496274
2. Rastogi S (2010) Building bridges between Ayurveda and modern science. Int J Ayurveda Res. 1(1):41-46.
3. FSSAI regulations on Ayurveda Aahar Regulations 2022. Gazette of India CG-DL-E-07052022-235642. New Delhi, Friday, May 6, 2022/ Vaisakha 16, 1944. • Frawley D (2012) Ayurvedic healing: A comprehensive guide. Lotus Press, India.

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to (keep number of COs according to units)

CO 1	Awareness of traditional food cultures of India.
CO 2	Evaluate changing food patterns and lifestyle over the years.
CO 3	To Understand Indian Knowledge Systems (IKS) and key Vedic principles with respect to Food and Nutrition.
CO 4	Apply basic tenets of traditional diets for health and disease.

COURSE OUTCOMES MAPPING

Unit No.	Unit Name	Course Outcomes			
		CO1	CO2	CO3	CO4
1	Introduction to Ayurvedic Nutrition				
2	Basic principles of Food and Nutrition and Ayurveda				
3	Ayurvedic Diets				
4	Market study on Ayurvedic Foods				

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6
CO1						
CO2						
CO3						
CO4						

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S.Y. B.Sc.- Semester III
Multidisciplinary Elective Course
MDC203-1C: Material Recycling and Waste Management (Theory)
Semester-III
Credit 4 Contact Hour per week 4 Outline of the Course:

Course type	Theory
Purpose of Course	The course "Fundamentals of Material Recycling and Food Waste Management" aims to equip students with essential knowledge and practical skills in managing waste sustainably. It covers key principles of waste management, environmental impacts of improper disposal, and diverse recycling methods. Students will learn to handle food waste, e-waste, and wastewater through biological, chemical, and integrated approaches, emphasizing innovative and sustainable practices. This course prepares students to address environmental and public health challenges related to waste.
Course Objective	• To understand the basics concept of Material Recycling and Waste Management. • To introduce various biological methodologies for waste management • To familiarize with the overall development of E-Waste management. • To acquire fundamental knowledge of waste water and about its treatment process. • To introduce the importance of the E-waste management.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2024
Pre-requisite	• Prerequisites for the course include a fundamental understanding of materials aspects in the context of Recycling and requirement of basics of biology and chemistry for understating in materials recycling and waste water management.
Teaching Methodology	Class Room Teaching, Discussion and Assignment, Demonstration
Evaluation Method	40% Continuous Assessment (CA) 60% End Semester Examination (ESE)

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Content:

Units	Particulars	% weightage of Unit	Min. No. of Hrs
1.	**Fundamentals of Material Recycling and Food Waste Management:** • Introduction to Government of India Policies on Waste Management • Introduction to Waste Management o Overview of waste management principles, including e-waste management o Importance of recycling and waste reduction • Environmental Impact of Waste o Understanding the environmental consequences of improper waste disposal, with emphasis on e-waste o Introduction to life cycle assessment (LCA) for e-waste products • Introduction to Food Waste Management o Causes and sources of food waste o Impacts on the environment and society • Overview of Recycling Methods o Introduction to biological, physical, chemical, and integrated approaches to recycling	25%	15
2.	**Biological Methods in Waste Management** • Composting o Principles of composting o Factors affecting composting efficiency, including integration of e waste components • Anaerobic Digestion o Microbial processes in anaerobic digestion o Biogas production and utilization, considering e-waste biomass • Bioremediation o Introduction to bioremediation techniques for waste treatment o Application of microorganisms in waste cleanup, including e-waste contamination	25%	15

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3.	**Waste water treatment:** • Overview of water and waste water systems • Urban water system • Treatment plans • Design process • Review of fundamentals Concentrations • Disinfection / Disinfectant removal Goal • Chlorine disinfection • UV light disinfection	25%	12
4.	**Chemical Recycling and Integrated Approaches** • Chemical Recycling o Chemical processes for polymer degradation and recycling, including e-waste plastics o Monomer recovery techniques, with consideration of e-waste materials • Integrated Waste Management Systems o Combined approaches for efficient waste management, integrating e waste recycling **Introduction to e-Waste treatment** • Government of India Policies on E-Waste Management • Overview of e-Waste Management • Brief Discussion on Environment and public health issue. • e-Waste health risk assessment • Recovery materials from e-Waste • Recovery metals from e-Waste	25 %	18

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REFERENCES:

1. "Waste Management and Sustainable Development" by Surindra Suthar and Gargi Vyas
2. Waste to Wealth: The Circular Economy Advantage" by Peter Lacy and Jakob Rutqvist
3. Food Waste Recovery: Processing Technologies and Industrial Techniques" by Charis M. Galanakis
4. Reference Book: "Biological Waste Treatment" by Barbel Diekman
5. "Anaerobic Biotechnology: Environmental Protection and Resource Recovery" by Gilbert Z. Cham and George A. Ekama
6. "Bioremediation and Bioeconomy" by Majeti Narasimha Vara Prasad and Bramha N. Singh 7. Waste Treatment and Disposal" by Paul T. Williams
8. Chemical Recycling of Plastics Waste" by Rafael Luque and Juan Carlos Colmenares
9. Waste Management and Sustainable Development" by Surindra Suthar and Gargi Vyas 10. Nanotechnology for Waste Management: From Resource Recovery to Environmental Applications" by Chaudhery Mustansar Hussain
11. Davis, Mackenzie L., Water and Wastewater Engineering: Design Principles and Practice, 2nd Edition, McGraw-Hill, New York, 2010.
12. Metcalf and Eddy, Wastewater Engineering: Treatment and Resource Recovery, Fifth Edition, Metcalf & Eddy, Inc., McGraw-Hill Publishers, New York, 2013.

Online Sources:

13. https://nptel.ac.in/courses/105105169

COURSE OUTCOMES:

Upon successful completion of the course, student will able to

CO 1.	Understand the basics concept of Material Recycling and Waste Management.
CO 2.	Acquire knowledge about various biological approaches and Identify salient aspects of biological methods for waste management
CO 3.	Know the overall scenario of E-Waste management in India in comparison with other countries around the globe.
CO 4.	Become familiar with the overview of wastewater treatment and understand methods of waste water treatment.
CO 5.	Understand the fundamentals of e-waste management and to recognize the chemical process and various approaches for polymer degradation and e-waste management.

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S.Y. B.Sc.- Semester III
AEC203-2C: COMMUNICATION SKILLS – I

Credit 2 **Contact Hour per week 2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-Level
Course Category	Ability Enhancement Course
Purpose of Course	To enhance students' understanding and proficiency in various aspects of communication skills as a subject.
Course Objective	CO 1. To make students aware of fundamentals of communication skills CO 2. To develop proficiency in communication skills CO 3. To cultivate reflective communication practices
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	New
Pre-requisite	Elementary knowledge of English Language
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE)- Formative 50% Semester End Evaluation (SEE)- Summative

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AEC203-2C: COMMUNICATION SKILLS – I

Course Content:

Unit No.	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Introduction to Communication** ● Meaning and Characteristics of Communication ● Types of Communication ● Modes of Communication ● 7 Cs of Communication	30	10
2	**Listening Skills** ● Note-taking ● Minutes of Meeting	30	10
3	**Reading Skills** ● Summarizing ● Paraphrasing ● Book/Film Review	40	10

Reference

- Adler, Mortimer J., and Charles Van Doren. How to Read a Book: *The Classic Guide to Intelligent Reading*. Simon and Schuster, 2014.
- Adler, Ronald B., and Jeanne Marquardt Elmhorst. *Communicating at Work: Principles and Practices for Business and the Professions.* 12th ed., McGraw-Hill Education, 2020.
- Beebe, Steven A., Susan J. Beebe, and Diana K. Ivy. *Communication: Principles for a Lifetime.* 7th ed., Pearson, 2019.
- Duke, Nell K., and P. David Pearson. "Effective Practices for Developing Reading Comprehension." *What Research Has to Say about Reading Instruction*, 3rd ed., International Reading Association, 2002.
- Gudykunst, William B., and Stella Ting-Toomey. *Culture and Interpersonal Communication.* 7th ed., Sage Publications, 2019.
- Harvey, Stephanie, and Anne Goudvis. Strategies That Work: *Teaching Comprehension for Understanding and Engagement*. Stenhouse Publishers, 2017.
- McCornack, Steven. Reflect & Relate: *An Introduction to Interpersonal Communication.* 5th ed., Bedford/St. Martin's, 2019.
- West, Richard, and Lynn H. Turner. *Introducing Communication Theory: Analysis and Application.* 7th ed., McGraw-Hill Education, 2020.
- Wood, Julia T. *Interpersonal Communication: Everyday Encounters*. 9th ed., Cengage Learning, 2020.

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AEC203-2C: COMMUNICATION SKILLS – I

Course Outcomes:

Upon successful completion of the course, students will be able to:

CO1	Demonstrate improved proficiency in communication by articulating ideas clearly, concisely, and confidently in various contexts.
CO2	Develop active listening and reading skills.
CO3	Exhibit enhanced skills in summarizing, paraphrasing, note taking in a comprehensive manner.

Course Outcomes Mapping:

Unit No.	Unit Name	Course Outcomes		
		CO1	CO2	CO3
1	Introduction to Communication			
2	Listening Skills			
3	Reading Skills			

Course Articulation Matrix:

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1							
CO2							
CO3							

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Semester III

SEC203-2C: Life Skills

Credit 2 **Contact Hour per week 2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate level
Course category	Skill enhancement course
Purpose of Course	Life skills subjects in college aim to foster holistic development by enhancing self-awareness, emotional intelligence, and interpersonal skills, while preparing students for careers through practical skills like time management and teamwork. They promote mental health with stress management techniques, improve financial literacy with budgeting education, and encourage civic engagement and ethical decision-making. Additionally, they teach practical life management skills and effective study techniques, promoting lifelong learning to produce well-rounded individuals ready for personal and professional success.
Course Objectives	• The aim of the course is to Enhance the ability to be fully self-aware by overcoming all fears and insecurities • Develop interpersonal skills and adopt good leadership behavior for self-empowerment and the empowerment of others. • Set appropriate goals; manage stress and time effectively.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review /	June 2024

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Revision	
Pre-requisite	Elementary knowledge various life skills
Teaching Methodology	Class Room Teaching, Discussion and Assignments, Practical classroom Exercises
Evaluation Method	Continuous and Comprehensive Evaluation (CCE) (50%) Semester End Evaluation (SEE) (50%)

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Introduction to Life Skills** 1.1 Definition of life skills and their importance 1.2 Domains life skills 1.3 Self-Awareness and Goal Setting 1.4 Emotional Intelligence	24 %	7
2	**Social Skills** 2.1 Social Networking 2.2 Mediating and negotiating skills 2.3 Counselling	26 %	8
3	**Professional Skills** 3.1 Definition and importance of critical thinking 3.2 Effective Problem-solving techniques 3.3 The decision making process 3.4 Ethical decisions and Integrity	26 %	8
4	**Physical and mental skill development** 4.1 Practicing Yoga and Meditation 4.2 Sports and Recreational Activities 4.3 Involvement in Performing and Visual Arts	24 %	7

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	4.4 Enhancing Human Well-Being		

References Books

1. Kumar P (2017): "Morality and Life Skills: The need and importance of life skills education", International Journal of Advanced Education and Research, Volume 2: Issue 4 Page no.144-148.

2. WHO (1997): Meaning of Life Skills. www.who.org.

3. Sirgy M and Eastes Richard J (2017); The Pursuit of Human Well-Being: The Untold Global History, Springer.

3. Himalayan Institute Core Faculty (2017). 5 Steps to Turning Inward: The Meditation Process. https://www.himalayaninstitute.org/presenter/himalayan institute-core-faculty

4. Zohar, I. (2015). "The art of negotiation" leadership skills required for negotiation in time of crisis. Procedia-Social and Behavioral Sciences, 209, 540-548.

5. Kochher, S.K. (1980): Guidance and Counselling, Sterling Publishers, New Delhi.

6. Education for Creativity: Bringing the Arts and Culture into Asian Education, UNESCO. 2005

COURSE OUTCOMES: After the completion of the course the student will be able to:

CO1	Define and Identify different life skills required in personal and professional life
CO2	Develop the knowledge about Social Skills like counselling and social networking
CO3	Use appropriate thinking and problem solving techniques to solve new problems
CO4	Understand the yoga, sports concepts and human Well being

COURSE OUTCOMES MAPPING

Unit No	Title of the Unit	Course Outcome			
		CO1	**CO2**	**CO3**	**CO4**
1	Introduction to Life Skills				
2	Social Skills				
3	Professional Skills				
4	Physical and mental skill development				

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COURSE ARTICULATE MATRIX

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1						
CO2						
CO3						
CO4						

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IKS202-2C: Indian Knowledge System: Vigyan

Credit 2 **Contact Hour per week 2**

Outline of the Course:

Course type	Theory/Practical
Purpose of Course	The course is intended to provide undergraduates with a foundational guide to the history, culture and philosophy of India and introduce them to the main themes and debates relating to that history.
Course Objective	CO 1. To provide a general introduction to Indian Knowledge System (IKS) and sensitize the students to the contributions made by ancient Indians in the field of Science, Philosophy and related applications and concepts. CO 2. Understanding the scientific value of the traditional knowledge of Bharata CO 3. Promoting the youths to do research in the various fields of Bhartiya knowledge system CO 4. Converting the Bhartiya wisdom into the applied aspect of the modern scientific paradigm
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2023
Pre-requisite	Eagerness to learn our ancient culture, our tradition.
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	40% Continuous Assessment (CA) 60% End Semester Examination (ESE)

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IKS202-2C: Indian Knowledge System: Vigyan

Course Content

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Scientific Approaches of IKS-I** ● Khagol/jyotish Vigyan (Astronomy): Panchaang, Celestial coordinate system, Prediction of monsoon rains ● Vastukala (Architecture):	25	8
2	**Scientific Approaches of IKS-II** ● Krishi Vigyan (Agricultural Practices): Agricultural heritage of India, Ancient agricultural practices, Plant protection through indigenous traditional knowledge during harvesting, threshing and storage ● Paryavaran Vigyan (Environmental Sciences)	25	7
3	**Scientific Approaches of IKS-III** ● Rasa Shastra Evam Dhatu Vigyan (Chemistry and Metallurgy): Vedic references to metals and metal working, Mining and ore extraction, Wax casting of idols and artefacts	25	8
4	**Scientific Approaches of IKS-IV** ● Ganita: Mathematics in India ● Water Management & Transportation: Harappan and Traditional Water Management System: Tank, Lakes, and Stepwells, Communities Involved in Water Management, Modes of Transportations and Reforms	25	7

Reference books

1. Introduction to Indian Knowledge System: Concepts and Applications, Archak, K.B. (2012). Kaveri Books, New Delhi.ISBN-13:978-9391818203
2. Introduction To Indian Knowledge System: Concepts and Applications, Mahadevan, B.Bhat, Vinayak Rajat,Nagendra Pavana R.N.PHI, ISBN: 9789391818203
3. Glimpse into Kautilya's Arthashastra Ramachandrudu P. (2010), Sanskrit Academy, Hyderabad ISBN:9788380171074
4. "Introduction" in Studies in Epics and Purāṇas, (Eds.), KM Munshi and N Chandrashekara Aiyer Bhartiya Vidya Bhavan

13 Teaching Methodology

A teaching method comprises the principles and methods used by teachers to enable student learning. In order to achieve its objective of focused process- based learning and holistic development, the teacher/faculty may use a variety of knowledge delivery methods:

1.1 Lectures/Class works:

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get new insights in the subject area, on which they can build their own bridges to higher learning. Classwork has the ability to enhance relationships between teachers and students. Create goal- oriented tasks for students to prepare and enable self-learning.

1.2 Discussions/ Seminars/Presentation:

Discussions / seminars / presentation are critical components of learning and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real-life issues and discussion groups lead to innovative problem-solving and ultimately to success.

1.3 Case Studies/ Self-Study:

Real case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of knowledge domain concerned. Technology is transforming higher Education learning and teaching though various case studies to improve overall standards.

1.4 Practical/Problem sheet:

Practical ability is the essential requirement for computer science undergraduates' ability structure, and it emphasizes that computer science undergraduates should have a good grasp of theory from practice and then apply the theory to practice, improving them own software developing skills and employ ability.

1.5 Assignments:

Computer science assignments not only help students overcome their fear and stress but also help them learn more interesting facts about the subjects of computer science which are part of their syllabus and also out of curriculum.

1.6 Industrial Tours:

Computer Science students have to know the things practically through interaction, working methods and employment practices. Moreover, it gives exposure from

academic point of view. Main aim industrial visit is to provide an exposure to students about practical working environment.

1.7 Team Work:

Teamwork based projects challenge the student to apply the technical knowledge they gain in college to solve meaningful and complex problems. Positive collaboration in the form of team work is critical in the classroom environment, for which it is necessary to transcend one's prejudices and predilections so as to achieve the desired outcomes. In the process of team work, learners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

14. Keywords

- Bachelor of Science (B.Sc.) in Food and Nutrition