

**D.K.M.COLLEGE FOR WOMEN  
(AUTONOMOUS), VELLORE**

**DEPARTMENT OF FOOD AND NUTRITION**

**B.Sc., Nutrition, Food Service Management &  
Dietetics**

**TANSICHE SYLLABUS**



**With the effect from**

**2024 - 2025**

## SEMESTER - I

Title of the Course		HUMAN PHYSIOLOGY								
Category	Year I	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CCI	I	Y		Y		5	4	25	75	100

Learning Objectives
To enable the students to:
Gain basic understanding of human anatomy and physiology
Discuss fundamental relationship between anatomy and physiology
Use familiarity with the human body and its functioning to make healthful choices with regard to nutrition and take appropriate action when signs of illness arise

UNIT	CONTENT	HOURS
<b>UNIT-I</b>	<p><b>Cell and tissues-</b>Structure and function of cell and its organelles. Cell Division. Classification, structure and functions of tissues.</p> <p><b>Blood-</b>Constituents of blood, RBC, WBC and Platelets and its functions. Erythropoiesis, Blood clotting, Blood groups and Histocompatibility.</p> <p><b>Immune system-</b> Antigen, Antibody, Cellular and Humoral Immunity (In brief)</p>	<b>12</b>
<b>UNIT-II</b>	<p><b>Nervous system-</b> Structure and functions of brain (cerebrum, brainstem, cerebellum), Spinal cord, structure and function; Functions of Autonomic Nerves and Cranial nerves.</p> <p>Structure and functions of Eye, Ear, Skin. Physiology of Taste and Smell- (in brief)</p>	<b>12</b>
<b>UNIT- III</b>	<p><b>Heart and circulation-</b> Anatomy of the heart and blood vessels, origin and conduction of heart beat, cardiac cycle, blood pressure-definition and physical factors affecting blood pressure, and description of normal ECG.</p> <p><b>Respiratory system-</b> Anatomy and physiology of respiratory organs. Mechanism of respiration; Gaseous exchange in the lungs and tissues.</p>	<b>12</b>

<b>UNIT-IV</b>	<p><b>Digestive system-</b> Anatomy of Gastro-intestinal tract, Structure and functions of Liver and Pancreas. Digestion and absorption of carbohydrates, proteins and fats.</p> <p><b>Excretory system-</b> Structure of kidney, structure of nephron, Physiology of urine formation.</p>	<b>12</b>
<b>UNIT-V</b>	<p><b>Endocrine system-</b> Functions, hypo and hyper secretions of hormones secreted by Pancreas, Pituitary gland, thyroid, parathyroid and adrenal glands.</p> <p><b>Reproductive system-</b> Anatomy of male and female reproductive organs, Menstrual cycle</p>	<b>12</b>
	<b>PHYSIOLOGY PRACTICALS</b>	
	<ol style="list-style-type: none"> <li>1. Microscopic studies of different tissues epithelial tissue Connective tissue, muscular tissue and nervous tissue.</li> <li>2. Microscopic study of blood smear, WBC, RBC estimation.</li> <li>3. Hemoglobin estimation</li> <li>4. Identification of blood groups</li> <li>5. Determination of Blood pressure</li> <li>6. Respiratory rate and pulse rate</li> <li>7. Study of structure of brain, heart, lung, kidney, liver, pancreas, stomach, male and female reproductive organs using models/charts/videos</li> </ol>	<b>15</b>
	<b>TOTAL</b>	<b>75</b>

## COURSE OUTCOMES

**After successful completion of the course the student will be able to:**

<b>Cos</b>	<b>Description</b>
<b>CO1</b>	Recall the structure and functions of the cell, its organelles and the various tissues
<b>CO2</b>	Describe the structure and functions of the various organs and systems in the body
<b>CO3</b>	Identify the microscopic structure of basic tissues, label the parts of primary physiological systems in the body such as nervous, respiratory, digestive, endocrine and reproductive systems.
<b>CO4</b>	Evaluate the role of the nervous and endocrine system in regulating the activities of other systems.
<b>CO5</b>	Perform hematological study on blood such as blood smear, blood count and blood grouping, record pulse, blood pressure and interpret a normal ECG.

## REFERENCES

1. Beck, W.S. (1971) Human Design. Harcourt Brace Jovanovich NC., New York.
2. Best, H. and Taylor N.B. (1980) Living Body. 4thed.BIP, Bombay.
3. Creager J.G. (1992) Human Anatomy and Physiology. 2nded. W MC Brown Publishers, England.
4. Guyton, A.C 1979) Physiology of the Human Body.5<sup>th</sup> ed. Saunders College of Publishing Philadelphia.
5. Subramaniam's. and Madhavan Kutty, K.(1971)The Text Book of Physiology. Orient Longman Ltd., Madras.
6. Tortora G.J. Agnostics N.P. (1984) PrinciplesofAnatomyandPhysiology,4th edition, Harper and Row Publishers, New York
7. Waugh A and GrantA. (2012) Ross and Wilson Anatomy and Physiology in Health and Illness. 11th ed. Churchill and Livingstone, Elsevier
8. Wilson, K.J.W. (1987) Anatomy and Physiology in Health and Illness.6th ed. ELBS, Churchill Livingstone, London

## E - LEARNING RESOURCES

- <https://youtu.be/uFf0zxQ3rBU>
- <http://epgp.inflibnet.ac.in/Home/Download> □

### Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	L	M	M	S
CO2	S	S	S	M	M	M	L	M	M	S
CO3	S	S	S	M	M	M	L	M	M	S
CO4	S	S	S	M	M	M	L	M	M	S
CO5	S	S	S	M	M	M	L	M	M	S

### Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	3
CO2	3	3	3	1	3
CO3	3	3	3	1	3
CO4	3	3	3	1	3
CO5	3	3	3	1	3
<b>Weightage</b>	15	15	15	5	15
<b>Weighted percentage (rounded of) Of Course, Contribution to POs</b>	3	3	3	1	3

Title of the Course		BASICS OF FOOD MICROBIOLOGY								
Category	Year I	L	T	P	O	Credits	Inst Hrs.	Marks		
	Sem							CIA	External	Total
Core Course CCII	I	Y		Y		4	4	25	75	100

Learning Objectives
To enable the students to:
Understand the interaction between micro-organisms and food
Discuss the factors that favor or inhibit the growth of microbes
Understand the role of microbes in fermentation, spoilage and food borne diseases.

UNIT	CONTENT	HOURS
UNIT-I	<p><b>Introduction to Food Microbiology-</b> History and Development of Food Microbiology. Definition and Scope Of Food Microbiology. Inter relationship of microbiology with other sciences.</p> <p><b>Characteristics of Microorganisms in Food-</b> Types of microorganisms(Bacteria, Molds and yeasts) associated with food, their morphology and structure Significance of spores in food Microbiology</p>	12
UNIT-II	<p><b>Microbial Growth in Food-</b> Bacterial growth curve and microbial growth in food, Factors affecting the growth of microorganisms in food. Methods for the Destruction of bacteria-application of dry heat, moist heat, filtration, radiation.</p> <p><b>Cultivation of Micro-organisms-</b> Pure culture technique. Methods of isolation and cultivation. Enumeration of Microorganisms- qualitative and quantitative</p>	12
UNIT-III	<p><b>Microbial Food Spoilage-</b> Sources of Microorganisms in foods. Some important food spoilage micro-organisms. Spoilage of specific food groups Milk and dairy products, Meat, poultry and sea foods, Cereal and cereal products, Fruits and vegetables and Canned products.</p>	12

<b>UNIT-IV</b>	<b>Food Fermentations:</b> Fermentation definition and types, Microorganisms Used in food fermentations, Dairy Fermentations-starter cultures and their types, Concept of probiotics, Fermented Foods-types, methods of manufacture Of vinegar, sauerkraut, tempeh, miso, soya sauce, beer, wine and Traditional Indian foods	<b>12</b>
<b>UNIT-V</b>	<b>Food borne Illnesses:</b> Types-food borne infections (Salmonellosis, Shigellosis, Vibrio para hemolytic, gastroenteritis, Enteropathogenic Escherichia coli, diarrhea, Hepatitis A) Foodborne bacterial Intoxications (Staphylococcal, Bacillus cereus, Botulism) and toxic infection (Clostridium perfringens gastroenteritis, Enterotoxigenic, E. coli gastroenteritis, Cholera, Listeriosis).  <b>Trends in Food Microbiology-</b> Rapid methods for detection of microorganisms in food-Nucleic acid-based, biosensor- based and immunological-based approaches.	<b>12</b>
<b>BASICS OF FOOD MICROBIOLOGY PRACTICALS</b>		
	<ol style="list-style-type: none"> <li>1. Laboratory safety rules and precautions.</li> <li>2. Familiarization with Instruments used in Microbiological Lab Microscope, Autoclave, Laminar Flow Bench, Hot air Oven, Incubator, BOD incubator, Centrifuge, pH meter, Bacterial Colony counter, anaerobic jar.</li> <li>3. Preparation of culture media.</li> <li>4. Sterilization Methods-Use of autoclave, hot air oven, UV lamp, Laminar air flow and Millipore filter</li> <li>5. Isolation of pure culture-Streaking, plating and serial dilution Method.</li> <li>6. Isolation of bacteria and fungi.</li> <li>7. Enumeration of bacteria-Standard plate count.</li> <li>8. Gram staining technique</li> <li>9. To study bacterial motility by hanging drop method.</li> <li>10. Wine/yoghurt/sauerkraut Preparation</li> </ol>	<b>15</b>
<b>TOTAL</b>		<b>75</b>

## COURSE OUTCOMES

After successful completion of the course the student will be able to:

<b>Cos</b>	<b>Description</b>
<b>CO1</b>	Understand the interaction between microorganisms and food
<b>CO2</b>	Obtain a basic understanding of the microbial phenomena occurring in food products And factors affecting the growth of microbes.
<b>CO3</b>	Recognize the microbes causing food spoilage and food borne illnesses.

<b>CO4</b>	Explain sources of contamination, principles of preservation and types of spoilage of different foods.
<b>CO5</b>	Evaluate the role of microorganisms in food safety

### REFERENCES

1. Adams, M.R. and M.O. Moss "Food Microbiology". New Age International, 2002
2. Bimorphs, C. W. 2005. Food, Fermentation and Microorganisms. Black well Pubs
3. Banwart, G.J. "Basic Food Microbiology" 2<sup>nd</sup> Edition. CBS Publishers, 1998.
4. Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, NewDelhi, 2004
5. Harrigan, W.P. 1988. Laboratory Methods in Food Microorganism. 3rd. Ed. Academic Press. San Diego.
6. Jay, J.M. "Modern Food Microbiology". 4th Edition. CBS Publishers, 2003.
7. Khairpur, Neelam. "Food Microbiology" Daya Publishing House, 2006. 8. Vijaya Ramesh. "Food Microbiology". MJP Publishers, Chennai, 2007

### E- LEARNING RESOURCES

<http://ecoursesonline.iasri.res.in/course/view.php?id=107>

□ <http://epgp.inflibnet.ac.in/Home/Download>

### Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	S	S	S	M	M	M	L	M	M	S
<b>CO2</b>	S	S	S	M	M	M	L	M	M	S
<b>CO3</b>	S	S	S	M	M	M	L	M	M	S
<b>CO4</b>	S	S	S	M	M	M	L	M	M	S
<b>CO5</b>	S	S	S	M	M	M	L	M	M	S

### Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	1	3
<b>CO2</b>	3	3	3	1	3
<b>CO3</b>	3	3	3	1	3
<b>CO4</b>	3	3	3	1	3
<b>CO5</b>	3	3	3	1	3
<b>Weightage</b>	15	15	15	5	15
<b>Weighted percentage (rounded of) of Course, Contribution to POs</b>	3	3	3	1	3

Title of the Course		WOMEN'S HEALTH AND WELLNESS								
Category	Year I	L	T	P	O	CREDITS	Inst Hrs.	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC1	I	Y		Y		2	2	25	75	100

Learning Objectives
To enable the students to:
Understand the diverse factors that has a bearing on women's health.
Highlight the factors that contribute to a healthy life style among women across the globe.

UNIT	CONTENT	HOURS
<b>UNIT-I</b>	<p><b>Nutrition for Women</b> – Dietary Guidelines for a healthy lifestyle, Current concepts pertaining to balanced diets, Nutrient requirements For adolescents, pregnant, nursing mother and older women with Special focus on Protein, Iron, Vitamin-D, Vitamin-C, Folic acid and Calcium, Factors affecting nutrient intake in women- Socio economic, Environmental conditions, Health conditions; Consequences of Eating Disorders in young women.</p> <p><b>Practical:</b> Preparation of simple healthy recipes, Planning Meals Based on Balanced diets.</p>	<b>6</b>
<b>UNIT-II</b>	<p><b>Physical Health-</b> Significance of body weight and body composition Parameters, Benefits of aerobic, flexibility and strength training aerobic, flexibility and strength training exercises on general health, bone health and risk associated with NCD's. Yoga and Fitness practices benefit for a holistic life.</p> <p><b>Practical:</b> A practical exposure to administering First Aids, a safety measure in maintaining physical health.</p>	<b>6</b>

<b>UNIT-III</b>	<b>Reproductive Health</b> - Menstrual Health-safe and hygienic practices to be followed, Pre- and Post-Menopausal concerns- preventive measures, sexually concerns-preventive measures, sexually transmitted diseases-an overview. <b>Practical:</b> Preparing anyone of the visual aid like pamphlet, slides, Diagrammatic representation or chart on anyone of the above topics To create a health awareness among women.	<b>6</b>
<b>UNIT-IV</b>	<b>Mental-</b> Common mental health problems-Depression, Anxiety and coping with Stress, Strategies to improve mental health-learning news kills and hobbies.	<b>6</b>
	<b>Practical:</b> Practice stress management /mental health promotion	

	techniques. Attempt effective use of social media in communicating health and wellness message.	
<b>UNIT-V</b>	<b>Social Health:</b> Balancing home and career, strengthening relationships,enhancing communication skills and leadership skills. <b>Practical:</b> Practice self-improvement techniques to enhance one's Personality health and wellness	<b>6</b>
	<b>Suggested Activity:</b> Workshop on flexibility and strength training exercises, fitness, relaxation techniques of yoga and meditation.	
	<b>TOTAL</b>	<b>30</b>

## COURSE OUTCOMES

**After successful completion of the course, the student will be able to:**

<b>CO's</b>	<b>Description</b>
CO1	Define terms related to nutrition, physical, reproductive, mental and social health.
CO2	Discuss the need for right nutrition, exercises and skills needed for the overall well-being of women.
CO3	Explain the significance of maintaining physical, reproductive, mental and social health for the overall well-being of women.
CO4	Devise strategies to improve women's health in a holistic manner.
CO5	Recommend simple measures for a healthy lifestyle.

## REFERENCES:

1. Lazada Scalia T, Matthews KA, Avis NE, ital. (2012) Role stress, role reward and mental health in a multiethnic sample of midlife women: results from the Study of Women's Health Across the Nation (SWAN). J Women's Health; 21(5):481-489.
2. Mahan K and Sylvia E. Stump(2000) Krause's Food Nutrition and Diet Therapy,

Saunders, USA.

3. Minkin M. J and Wright C.V.(2003) The Yale Guide to Women’s Reproductive Health from menarche to menopause. Yale University Press, London
- 4.Sizer F.S. and Whitney E. (2014) Nutrition: Concepts &Controversies.13<sup>th</sup> ed., Wadsworth, Cengage Learning, USA.
5. Sperry L. (2016) Mental Health and Mental Disorders. ABC-Clio, California.
6. Williams M.H., Anderson D.E., Rawson E.S. (2013) Nutrition for Health, Fitness and Sport. McGraw Hill, New York.
7. WRDU’s C, Hamel M, Wagner J, Neyer FJ.(2013)Social network changes and life events across the life span: a meta-analysis. Psychol Bull;139(1):53-80.

**E-LEARNING RESOURCES:**

- [https://www.nhp.gov.in/social-health\\_pg](https://www.nhp.gov.in/social-health_pg)
- <https://ncert.nic.in/textbook/pdf/jehp112.pdf>
- <https://ncert.nic.in/textbook/pdf/iehp113.pdf>
- <https://ncert.nic.in/textbook/pdf/lebo104.pdf>
- <https://www.nih.gov/health-information/social-wellness-toolkit>
- <https://www.cdc.gov/reproductivehealth/womens/mensrh/index.htm>
- <https://www.nimh.nih.gov/health/topics/caring-for-your-mental-health>
- <https://www.who.int/news-room/fact-sheets/detail/mental-health>

**Mapping with Programme Outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	L	M	M	M	L	L	S
CO2	S	S	S	M	M	M	S	M	M	S
CO3	S	S	M	S	M	S	S	S	M	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	M	M	S	S	S	M	S	S

**Mapping with Programme Specific Outcomes**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	1
CO2	3	3	2	3	3
CO3	3	3	3	3	3

<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	13	15	13
<b>Weighted percentage (rounded of) Of Course, Contribution to POs</b>	3	3	3	3	3

<b>Title of the Course</b>		<b>Foundations of Home science- Nutrition, Food Service Management and Dietetics</b>								
<b>Category</b>	<b>Year I</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>O</b>	<b>Credits</b>	<b>Inst Hrs.</b>	<b>Marks</b>		
	<b>Sem I</b>							<b>CIA</b>	<b>External</b>	<b>Total</b>
Foundation Course FC		Y				2	2	25	75	100

### Learning Objectives

#### To enable the students to:

Understand the basics in Nutrition, Food Service Management & Dietetics Gain awareness on the care opportunities in Home science

<b>UNIT</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>UNIT-I</b>	<b>Introduction to Food Science</b> –Definition, Food groups and their nutritional composition. Functions of food- physiological, psychological and social. Relationship between food, nutrition and health.	4
<b>UNIT-II</b>	<b>Introduction to Nutrition and Dietetics:</b> a. Definition of Nutrition , Nutrients. Basic function of Carbohydrates, Lipids, Proteins, Fat soluble vitamins, Water Soluble vitamins and Minerals. Deficiency/excess of nutrients Definition, Significance of Nutrition through different stages of life. b. Definition of balanced diet, Importance of menu planning. Difference between normal and therapeutic diets c. Role of diet and life style changes in health promotion and disease Prevention.	7
<b>UNIT-III</b>	<b>Introduction to Food Service Management -</b> a) Definition of Food Service and Food Service Management; Types of food service establishments- commercial and non commercial b) Foodservice- Types (in brief) c) Introduction to concepts of management, functions of manager in managing resources like man power, materials, money, time, machinery and methods.	6

<b>UNIT-IV</b>	<b>Introduction to electives under Home Science</b> Definition, broad outline and scope of A. Human Development B. Interior Decoration C. Sports Nutrition. D. Principles of Resource Management	<b>6</b>
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<b>UNIT-V</b>	<b>Career Opportunities in Home Science-Nutrition, Food Service Management and Dietetics</b> A. Seeding importance of higher studies and its role in enhancing job opportunities  B. Exposure to Job opportunities-Role and Responsibilities of Nutritionist and Dietitian, Research scientist, Fitness coach, Certified Nutrition specialist, Health coach, Health educator and Community Nutritionist, CDPO, Food Safety Officer, Registered Dietitian, Rehabilitation Counselor, Lactation Consultant and Sports Nutritionist, Manager of Food/Hospitality Services, Interior Designer, Colour Consultant, Special Educators, Montessori trainers,  C. Start up with their own basic-business knowledge	<b>7</b>
	<b>TOTAL</b>	<b>30</b>

## **COURSE OUTCOME**

**After successful completion of the course the students will be able to**

<b>COs</b>	<b>Description</b>
<b>CO1</b>	Describe basic concepts in Food Science, Nutrition, Dietetics and Food Service Management
<b>CO3</b>	Identify the relationship between food, nutrition, diet and health
<b>CO2</b>	Explain the concept of Food Services and Food Service Management
<b>CO4</b>	Analyze the importance of the study of Food Service Management, Human Development, Interior Decoration and Textiles
<b>CO5</b>	Summarize the career opportunities available in-Home Science, Nutrition, Dietetics and Food Service Management

## **REFERENCES**

1. Anastasia Snelling(2014),Introduction to Health Promotion, Wiley Publications
2. Prelate Mullick (2012), Textbook of Home science, Kalyani Publishers.
3. Emie Cohen (2021), How Food Heals: A Look into Food as Medicine for Our Physical and Mental Health, New Degree Press
4. Gurie Hughes (2021), Food and Mental Health: A Guide for Health Professionals, Routledge Publishers
5. Kaveri Chakravarthy and A.S. Chakrabarty, (2021), Textbook of Nutrition in Health and Disease, Springer Publications

**E-LEARNINGRESOURCES**

- [https://www.researchgate.net/publication/322886774\\_Changing\\_perspective\\_of\\_Home\\_Science\\_Education\\_in\\_India](https://www.researchgate.net/publication/322886774_Changing_perspective_of_Home_Science_Education_in_India)
- <https://epgp.inflibnet.ac.in/>
- <https://www.nature.com/subjects/nutrition>

**Mapping with Programme Outcomes**

	PO1	PO2	PO3	PO4	PO5				8	
<b>CO1</b>	S	S	L	L	M	M	L	L	L	S
<b>CO2</b>	S	S	M	L	M	M	M	L	L	S
<b>CO3</b>	S	S	M	L	M	M	L	L	L	S
<b>CO4</b>	S	S	M	L	M	S	M	M	L	S
<b>CO5</b>	S	S	M	L	M	M	L	M	L	S

**Mapping with Programme Specific Outcomes**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	2	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	14	15
<b>Weighted percentage (rounded of) Of Course, Contribution to Pos</b>	3	3	3	3	3

**SEMESTER -II**

Title of the Course		FOOD SCIENCE								
Category	Year I	L	T	P	O	Credits	Inst Hrs.	Marks		
	Sem							CIA	External	Total
Core Course CCIII	II	Y				5	5	25	75	100

Learning Objectives
To enable the students to:
Understand the classification of foods according to their functions.
Gain knowledge on the composition and nutritive value of foods.
Know the basic methods of cooking and its influence on food.

UNIT	CONTENT	HOURS
UNIT-I	<p><b>Introduction to Food and Cooking Methods</b>                      Definition- Food, food science, nutrients, balanced diet; Need for grouping foods-Basic IV and V food groups, food pyramid and my plate. Functional classification of foods-Energy yielding, body building, protective and regulatory foods.</p> <p><b>Cooking</b>-Objectives, cooking methods-Moist and Dry heat methods of cooking, merits and demerits. Microwave cooking, ohmic cooking, induction cooking and solar cooking</p>	<b>12</b>

<b>UNIT-II</b>	<p><b>Cereals, Millets, Pulses, Legumes and Nuts:</b></p> <p><b>Cereal and Millets</b>–Structure, composition and nutritive value of rice, wheat and millets. Milling of wheat and rice, parboiling of rice. Effect of cooking on the nutritive value of cereals. Dextrinization, gelatinization, retrogradation and gluten formation.</p> <p><b>Pulses and legumes</b>-Types, nutritive value, methods of cooking, Factors affecting cooking quality of pulses, effect of germination on the nutritive value of pulses, cereal and pulse combination and its significance. Toxic constituents of pulses and methods of inactivation. Textured Vegetable Protein.</p> <p><b>Nuts</b> -Types, composition, role of nuts in cookery.</p> <p><b>Oilseeds</b> -Types, methods of processing, uses and shelf life.</p>	<b>15</b>
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<b>UNIT-III</b>	<p><b>Vegetables, Fruits and Milk:</b></p> <p><b>Vegetables</b> -Classification, nutritive value, types of pigments, selection of vegetables, effect of cooking on colour, texture, flavor, appearance and nutritive value.</p> <p><b>Fruits</b>-Classification, nutritive value, changes that occur during ripening, enzymatic browning and its prevention.</p> <p><b>Milk</b> -Composition and nutritive value, types of milk, pasteurization homogenization and coagulation of milk, Effect of cooking and processing on milk. Non-fermented milk products –Skimmed milk and milk powder; fermented milk products–cheese and curd.</p>	<b>15</b>
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<b>UNIT-IV</b>	<p><b>Fleshy foods and Egg Meats</b>–structure, nutritive value, cuts of meat, selection of meat, post mortem changes in meat, ageing, factors affecting tenderness of meat, changes during cooking.</p> <p><b>Poultry</b>- types, nutritive value, selection, changes during cooking.</p> <p><b>Fish</b>-classification, nutritive value, selection, changes during cooking. <b>Eggs</b>-Structure, nutritive value, selection, uses in cookery; foam formation and factors affecting foam formation, changes during cooking.</p>	<b>18</b>
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<b>UNIT-V</b>	<p><b>Fats and Oils</b>-Types-difference between cold pressed and regular cooking oils, hydrogenated fat, emulsification, rancidity, smoking point. Factors affecting absorption of oils while frying foods, harmful effects of reheated oils. Uses of fat in cookery-factors affecting absorption of fats-smoking point-Rancidity.</p> <p><b>Sugar</b>-Types of sugars, stages of sugar cookery, crystallization, factors affecting crystallization.</p> <p><b>Spices and Condiments</b> –Classification, uses in Indian cookery</p> <p><b>Beverages</b>-Classification – fruit-based beverages; milk-based beverages nutritive value and uses, alcoholic beverages, coffee, tea and cocoa, malted beverages.</p>	<b>15</b>
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<b>TOTAL</b>		<b>75</b>
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## COURSE OUTCOMES

After successful completion of the course the student will be able to:

COs	Description
CO1	Identify and classify foods based on the food grouping system and illustrate their use.
CO2	Define the foods, describe its structure and distinguish their composition.
CO3	Demonstrate ability to appraise nutritive value of different food groups and select good quality foods.
CO4	Compare the nutrients present in different types of food and choose foods rich in specific nutrients.
CO5	Analyze the effect of cooking on the quality of food and discriminate the Desirable and undesirable changes.

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### E- LEARNING RESOURCES

<https://www.pdfdrive.com/food-science-books.html>

<https://archive.org/details/textbookoffoodsc0000khadhttps://himitepa.1k.ipb.ac.id/e>

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### Mapping with Programme Outcomes

CO/PO	PO 1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO10
CO1	S	S	S	S	M	M	L	S	M	S

<b>CO2</b>	S	S	S	S	M	M	L	S	M	S
<b>CO3</b>	S	S	S	S	M	M	L	S	M	S
<b>CO4</b>	S	S	S	S	M	M	L	S	M	S
<b>CO5</b>	S	S	S	S	M	M	L	S	M	S

**Mapping with Programme Specific Outcomes**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO 2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	2	2	3
<b>CO2</b>	3	3	2	2	3
<b>CO3</b>	3	3	2	2	3
<b>CO4</b>	3	3	2	2	3
<b>CO5</b>	3	3	2	2	3
<b>Weightage</b>	15	15	10	10	15
<b>Weighted percentage (rounded of) Of Course, Contribution to POs</b>	3	3	2	2	3

Title of the Course		BASIC COOKERY PRACTICAL								
Category	Year I	L	T	P	O	Credits	Inst Hrs.	Marks		
	Sem II							CIA	External	Total
Core Course CCIV				Y		3	3	25	75	100
<b>Learning Objectives</b>										
To enable the students to:										
Understand the scientific principles underlying the preparation of food										
Apply the principles of cookery in cooking foods to preserve its nutrient content and minimize cooking time.										
Acquire skills in preparation of foods with good palatability and preservation of nutritive value										

UNIT	CONTENT	HOURS
UNIT-I	<p><b>Introduction to Basic Cooking Skills</b></p> <p>Introduction to different cooking methods, cooking terminology; Equipment and techniques used for pre-preparation and for different Cooking methods. Methods of measuring and weighing liquids and dry ingredients. The Use and care of simple kitchen equipment. Introduction to food safety, sanitation and hygiene in the kitchen, Safe practices in handling knives, sharp instruments, fuels and Materials at high temperature.</p>	10

<p><b>UNIT- II</b></p>	<p><b>Cereals, Millets and pulses</b></p> <p><b>Cereals and Millets:</b> Methods of combining fine and coarse cereal with Liquid (e.g. Ragi porridge, rava upma) Method of cooking cereals and factors influencing texture and nutritive value-cooking rice by boiling and straining, absorption method, steaming, pressure cooking, microwave cooking; Gelatinization and dextrinization. Preparation of recipes using rice- putt, dosai, idly/idiyappam, lemon rice, curd rice, coconut rice, fried rice, tamarind rice, tomato rice, mint pulao-a few Wheat and Millet preparations- Kesari, Pulka, poori, paratha, naan, ragi Adai, samai curd rice, thinai up puma,-a few</p> <p><b>Pulses:</b></p> <p>Factors influencing texture, digestibility and nutritive value of whole gram/legumes and pulses-soaking, addition of sodium bicarbonate, addition of salt, water quality-hard and soft water, pressure cooking, boiling and straining. Pulse preparations-Sundal, sambhar, sprouted green gram pat Chadi, Vadai, Pongal, ompodi, green gram payasam, masala vadai, medhu vadai-a few</p>	<p><b>15</b></p>
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<p><b>UNIT-III</b></p>	<p><b>Vegetables and Fruits</b></p> <p><b>Vegetables:</b> Basic cuts of vegetables- Slice and mince (onions) Shred (cabbage, spinach), dice (carrot), chop (tomato), grating (beetroot), and Their uses in dishes. Changes in color, texture and nutritive value of Vegetables due to different methods of cooking, cooking medium and Addition of acid/alkali. Vegetable preparations- Poriyal, Aloo methi curry, vegetable cutlet, thorn, vegetable kurma, avail, keerai masiyal, vegetable salad, vegetable soup, vegetable sandwich, kootu, mint chutney and carrot halwa-a few</p> <p>Fruits: Enzymatic browning in fruits and methods to prevent it. Fruit preparations- stewed apple, banana fritters, fruit salad, fruit punch, fruit yoghurt and fruit smoothie, preserve/jam-a few</p>	<p><b>20</b></p>
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<b>UNIT-IV</b>	<p><b>Eggs, and milk products, meat and fish:</b></p> <p><b>Egg Cookery:</b> Boiling of eggs-hard and soft boiled eggs. Best method of boiling eggs. Prevention of Ferrous sulphide formation on the yolk. Poaching and frying. Coagulation of egg protein-stirred and baked custard Egg preparations -egg curry, omelet, French toast, caramel custard (steamed), scrambled eggs and fried eggs- a few. Factors affecting whipping quality of egg white –effect of salt,sugar, vinegar, fat and milk,type of container used and beaters, Stages of foam formation in whipped egg whites and their uses in cookery.</p> <p><b>Milk and milk products</b> Curdling of milk using lime juice, butter milk, tomato juice. <b>Milk preparations</b> Cream of tomato soup, paneer masala, payasam, pat Chadi, thayir vadai, mor kulumbu, basundhi, lassi, spiced butter milk and baked macaroni and cheese-a few.</p> <p><b>Meat and Fish</b> Methods of tenderizing meat-Pounding, mincing addition of acids like curd/lime juice in marinade, addition of proteolytic enzymes-raw papaya. Effect of different methods of cooking on flavor, texture and appearance of meat and fish. Meat preparations-mutton ball curry, mutton vindaloo, mutton keema, Liver fry, chicken spring roll, chicken sweet corn soup, chicken biriyani. Sea food preparations-fish fry, fish moilee, fish cutlet, sweet and sour prawns- a few</p>	<b>15</b>
<b>UNIT-V</b>	<p><b>Sugar cookery, Fats and oils and Beverages</b></p> <p><b>Sugar Cookery</b>-Stages of sugar cookery and uses. Preparations of Sweets using different stages of sugar cookery</p> <p><b>Fats and oils</b>-Effect of temperature of oil on texture and palatability of foods-Frying pooris at different temperatures. Smoking point of oil-breadcube test. Emulsions-definition, Preparation of mayonnaise</p> <p><b>Beverages</b>-Preparation of Coffee and Tea using different methods</p>	<b>15</b>
	<b>TOTAL</b>	<b>75</b>

### **COURSE OUTCOMES**

**After successful completion of the course the student will be able to:**

<b>CO1</b>	Identify appropriate methods for weighing dry and wet food ingredients and for cooking different foods.
<b>CO2</b>	Select suitable methods for cooking cereals, pulses, vegetables, eggs ,milk, ,meat, fish and poultry.
<b>CO3</b>	Apply the principles of cookery, cooking techniques and suitable ingredients and additives in preparing dishes.
<b>CO4</b>	Explain the reasons behind the changes that occur during food preparation.
<b>CO5</b>	Justify the best preparation and cooking methods for

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**E-LEARNING RESOURCES:**

[https://www.ihmnotes.in/assets/Docs/Books/Theory\\_of\\_Cookery.pdf](https://www.ihmnotes.in/assets/Docs/Books/Theory_of_Cookery.pdf)

□ <http://staffnew.uny.ac.id/upload/132318572/pendidikan/buku-esp.pdf>

**Mapping with Programme Outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	S	L	S	S	S	L	L	S	L	S
<b>CO2</b>	S	M	S	L	S	M	M	L	S	S
<b>CO3</b>	S	S	S	M	S	S	S	S	S	S
<b>CO4</b>	S	S	S	S	S	M	L	S	L	S
<b>CO5</b>	S	S	S	S	S	S	S	S	S	S

**Mapping with Programme Specific Outcomes**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	2	1	3	3
<b>CO2</b>	3	2	1	3	3
<b>CO3</b>	3	2	3	3	3
<b>CO4</b>	3	3	1	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	12	9	15	15
<b>Weighted percentage (rounded off) of Course, Contribution to POs</b>	3	2	1	3	3

Title of the Course		LIFE SKILL STRATEGIES AND TECHNIQUES								
Category	Year I	L	T	P	O	Credits	Inst Hrs.,	Marks		
	Sem							CIA	External	Total
Elective/ SEC -2	II	Y		Y		2	2	25	75	100

<b>Learning Objectives</b>		
To enable the students to:		
Develop skills for a healthy personal and professional approach to life.		
Gain competency and confidence through mastery of skills needed for holistic living		
<b>UNIT</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>UNIT-I</b>	<b>Communication Skills</b> Developing Listening, Speaking and Reading Skills, An introduction to Scientific Writing, Letter Writing and Usage of Non-verbal Communication. Writing for Grants- a brief Proposal, Statement of Purpose (Sop). Effective use of social media in communicating messages.	<b>10</b>
<b>UNIT-II</b>	<b>Professional Skills</b> Resume Writing. Interview Skills. Group Discussions, Presentation Skills. Work-Life Balance- Strategies to achieve them, Time Management.	<b>10</b>
<b>UNIT-III</b>	<b>Leadership/Management Skills</b> Leadership skills, Managerial skills, Team building, Entrepreneurial skills, Ethics and Integrity.	<b>10</b>
<b>UNIT-IV</b>	<b>Basic Lifestyle-related Skills</b> Healthy eating using simple cooking practices, Home makeover skills, Basics in Gardening, Stress Management- Yoga and Fitness practices- benefits for a Holistic Life, An introduction to Martial Arts as a protective strategy.	<b>10</b>
<b>UNIT-V</b>	<b>Human Value Skills</b> Strategies and techniques to promote Non-Violence, Service to the community, developing skills pertaining to administering First Aid.	<b>10</b>
	<b>Practical</b> 1. Workshops on Leadership/ Writing Skills, Yoga and Martial Arts. 2. Developing Listening and Speaking Skills. 3. Practical Demonstration on healthy recipes. 4. A practical exposure to administering First Aid.	<b>10</b>
	<b>TOTAL</b>	<b>60</b>

### **COURSE OUTCOME**

**After successful completion of the course, the student will be able to:**

**CO1.** Describe different skills and techniques needed to maintain a healthy personal and professional approach to life.

**CO2.** Identify skills needed for a healthy lifestyle.

**CO3.** Explain the need to develop various skill sets for a holistic life.

**CO4.** Develop confidence with respect to emotional competency, personal and professional life. **CO5.** Recommend life skill strategies for the holistic development of the individual.



**Mapping with Programme Specific Outcomes**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage (rounded of) of Course Contribution to Pos</b>	3	3	3	3	3

Title of the Course		BASICS IN FOOD PRODUCT DEVELOPMENT								
Category	Year I	L	T	P	O	Credits	Inst Hrs.	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC3	II	Y				2	2	25	75	100

<b>Learning Objectives</b>
To enable the students to:
Determine customers needs and desires that can lead to new product development
Discuss the preparation of new products based on utility, convenience and unique dietary requirements.
Recognize the novelty in traditional Indian foods

UNIT	CONTENT	HOURS
<b>UNIT-I</b>	<b>Introduction to the development of food products</b> Concepts, definitions & characteristics. Factors to be consider for food productdevelopment (external and internal factors).	<b>3</b>
<b>UNIT-II</b>	<b>Phases of food product development</b> Development of product prototype-market research, concept testing approaches, product formulation and specification, product optimization, process development & optimization, product attributes, scale up requirements; Product prototype testing- consumer testing, packaging testing, shelf life testing, product integrity and conformance to standards; Marketing plans -price structure, place & distribution system, promotional program, market positioning, test marketing, results evaluation	<b>10</b>
<b>UNIT-III</b>	<b>Concepts in sensory evaluation of foods</b> Sensory attributes of foods: Chemical senses (olfactory an gustatory);physical, kinesthetic and tactile senses (appearance, color, texture & over all taste).	<b>5</b>
<b>UNIT-I V</b>	<b>Sensory evaluation methods</b> Definition, advantages and disadvantages. Subjective tests: Analytical tests(sensitivity tests, difference tests, ranking tests), descriptive tests and consumer/preference tests.	<b>5</b>
<b>UNIT-V</b>	<b>Objective and instrumental evaluation methods</b> Objective methods for appearance, size, shape, volume, specific gravity, Refractive index, moisture, fat, and others. Instrumental methods for evaluation of color, viscosity, texture & aroma.	<b>7</b>
	<b>TOTAL</b>	<b>30</b>

## COURSE OUTCOMES

After successful completion of the course, the student will be able to:

COs	Description
<b>CO1</b>	Identify, categorize and analyze major trends in product development.
<b>CO2</b>	Identify the processes & stages for new product development from conception to commercialization.

<b>CO3</b>	Understand the role of sensory and objective evaluation in product development, quality control and research in the food and other consumer industries.
<b>CO4</b>	Explain the adequate theoretical background and practical understanding of sensory evaluation of food.
<b>CO5</b>	Develop a new food product from concept to prototype or pilot-scale Production with the inclusion of a critical analysis of the quality, safety, shelf-life, packaging, labeling and cost of the product.

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- <http://epgp.inflibnet.ac.in/Home/Download>

### Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	S	S	S	M	M	M	L	M	M	S
<b>CO2</b>	S	S	S	M	M	M	L	M	M	S
<b>CO3</b>	S	S	S	M	M	M	L	M	M	S
<b>CO4</b>	S	S	S	M	M	M	L	M	M	S
<b>CO5</b>	S	S	S	M	M	M	L	M	M	S

### Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	1	3
<b>CO2</b>	3	3	3	1	3

<b>CO3</b>	3	3	3	1	3
<b>CO4</b>	3	3	3	1	3
<b>CO5</b>	3	3	3	1	3
<b>Weightage</b>	15	15	15	5	15
<b>Weighted percentage(rounded of) Of Course Contribution to Pos</b>	3	3	3	1	3

## **B.SC. NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS**

### **Programme Educational Objectives (PEOs)**

#### **PEO1: Attain Academic and Professional Excellence**

Build a strong academic foundation and skill set that will enable success in higher education, competitive examinations, teaching, research, industry, and entrepreneurial ventures.

#### **PEO2: Emerge as Empowered Individuals**

Develop into confident, self-reliant, and economically independent women capable of applying scientific knowledge to enhance personal growth, family welfare, and community development.

#### **PEO3: Advance Research and Innovation**

Demonstrate the ability to investigate real-world challenges and contribute contextually relevant, research-driven, and innovative solutions across scientific disciplines.

#### **PEO4: Uphold Ethical and Cultural Values**

Adhere to high ethical standards, respect cultural diversity, and engage responsibly in scientific practices that contribute to a just and inclusive society.

#### **PEO5: Respond to Societal and National Needs**

Utilize scientific understanding to support public health, environmental conservation, and technological advancement, fostering inclusive regional and national progress.

#### **PEO6: Exhibit Leadership and Social Responsibility**

Lead scientific and community initiatives with integrity, inspire collaborative action, and actively contribute to positive social transformation at local and global levels.

#### **PEO7: Engage in Lifelong and Global Learning**

Pursue continuous personal and professional development while staying abreast of global trends, innovations, and interdisciplinary scientific advancements.

## **Programme Outcomes (POs)**

### **PO1: Comprehend and Apply Scientific Knowledge**

Acquire and apply core knowledge from scientific disciplines to understand natural phenomena, solve complex problems, and support innovation across various domains of life and industry.

### **PO2: Demonstrate Analytical and Critical Thinking**

Develop the ability to think critically and analytically by formulating hypotheses, interpreting experimental results, evaluating scientific literature, and drawing evidence-based conclusions.

### **PO3: Exhibit Technical and Laboratory Competency**

Gain proficiency in laboratory techniques, handling of scientific instruments, and use of software tools, while adhering to safety protocols, accuracy, and reproducibility in experimental work.

### **PO4: Communicate Effectively**

Present scientific concepts and findings clearly and coherently through oral presentations, technical writing, and the use of digital tools, adapting to both academic and professional contexts.

### **PO5: Uphold Ethical Values and Environmental Consciousness**

Integrate ethical principles and environmental awareness into scientific practices, promoting sustainable solutions and a sense of accountability towards society and nature.

### **PO6: Engage in Lifelong Learning**

Cultivate an inquisitive mindset and adaptability to emerging scientific advancements, technologies, and interdisciplinary approaches, thereby remaining relevant and competent throughout life.

### **PO7: Collaborate and Lead in Scientific and Social Contexts**

Participate effectively in collaborative scientific projects and community-based activities, demonstrating leadership, decision-making, and commitment to women's empowerment and societal progress.

**PSO1: Understand Core Concepts of Nutrition and Dietetics**

Apply foundational knowledge in human physiology, nutrition, food science, and dietetics to analyze the role of nutrients in health and disease prevention.

**PSO2: Plan and Manage Food Services**

Gain proficiency in menu planning, food production, quantity cooking, and institutional food service management with a focus on hygiene, budgeting, and quality control.

**PSO3: Promote Public Health and Community Nutrition**

Develop and implement nutrition education programmes to improve community health, particularly for vulnerable populations, addressing local and national nutritional concerns.

**PSO4: Apply Clinical and Therapeutic Nutrition**

Assess nutritional needs and plan appropriate therapeutic diets for individuals with various medical conditions in clinical and hospital settings.

**PSO5: Demonstrate Practical and Laboratory Competence**

Acquire technical skills in food analysis, meal preparation, anthropometry, and biochemical assessment, ensuring adherence to safety and accuracy.

**PSO6: Uphold Professional Ethics and Social Responsibility**

Practice dietetics and food service management with ethical responsibility, environmental consciousness, and a commitment to women's and community welfare.

**PSO7: Engage in Lifelong Learning and Entrepreneurship**

Stay updated with advances in nutrition science and food technology, while developing entrepreneurial ventures in diet consultancy, wellness coaching, or food service enterprises.

### SEMESTER III

Title of the Course		HUMAN NUTRITION								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC V	III	Y		Y		5	5	25	75	100

Learning Objectives
To enable the students to:
Understand the importance of various macronutrients in relation to health.
Highlight dietary guidelines for various nutrients and contribute towards a better lifestyle for prevention of non-communicable diseases.

UNIT	CONTENT	HOURS
<b>UNIT I</b>	<b>Introduction To Nutrition</b> History of Nutrition– Development of Nutritional Science Food Source Of Nutrients, definition of nutrients, Balanced diets and dietary guidelines-current concepts Signs And Symptoms Inadequate,optimum good nutrition, malnutrition (Undernutrition,and overnutrition), Assessment of Nutritional Status- Anthropometric, Biochemical,Clinical and Dietary aspects.	7
	<b>Activity-Plan Meals Based</b> on My- Plate Concepts, Record Height, Body weight, and calculate BodyMassIndex(BMI) in A small sample,and categorize according to BMI.	3
<b>UNIT II</b>	<b>Carbohydrates</b> Classification, Food Sources, Requirements and Functions of carbohydrates in the body. Review Of Digestion, absorption and metabolism. Physiological significance of Monosaccharide, Disaccharides and Polysaccharides Glycemic Index, Glycemic load of Foods,and factors affecting its Hormonal Control Of Blood sugar. Role of fiber in prevention of noncommunicable diseases. <b>Proteins</b> Amino Acids- Indispensable And Dispensable Amino Acids. Classification,Sources, Requirements and functions of protein.Mutual Supplementation Of Proteins.Protein deficiency- Protein Energy Malnutrition-Kwashiorkor and Marasmus– etiology, clinical features, treatment and prevention. Evaluation of protein quality- PER, BV, NPU and NPR, chemical score. ProteinSupplements and Novel Protein sources Benefits and Health Concerns.	17

	<b>Activity-</b> List foods based on their GI,and Protein Supplements Available In the market.	<b>3</b>
<b>UNIT III</b>	<p><b>Lipids</b> Classification, Sources, Requirements and functions, Essential fatty acids-deficiency, food sources and functions, Healthy and Unhealthy Fats in the diets,Dietary lipids and its relation to cardiovascular diseases.</p> <p><b>Energy</b> Determination of energy value of foods using Bomb Calorimeter, Physiological value of foods,relation between oxygenated and calorific value. Direct and Indirect calorimetry, Respiratory quotient Components of Energy expenditure- Basal metabolism,factors affecting BMR,Food related thermogenesis,Physical activity Energy requirements for different age groups,and for various types of activities.</p>	<b>17</b>
	<b>Activity-</b> List healthy and unhealthy Sources Of Fats in diet. Learn to estimate BMR.	<b>3</b>
<b>UNIT IV</b>	<p><b>Fat Soluble Vitamins</b> Food Sources, Requirements, Functions,Effects of deficiency or Toxicity(whenever applicable).</p> <p><b>Water Soluble Vitamins</b> Food sources,Requirements,Functions,Effects Of Deficiency. Antioxidant role of certain Vitamins in Health Promotion</p>	<b>10</b>
<b>UNIT V</b>	<p><b>Macro minerals</b> Calcium, Phosphorus, Magnesium, Potassium, Sodium and Chloride-Distribution in the body, functions, food sources,requirements, effects of deficiency and toxicity.</p> <p><b>Micro/Trace Minerals</b> Iron, Zinc, Iodine, Selenium, Manganese, Chromium, Fluoride and Copper Distribution in the body; functions, effects of deficiency, food sources and requirements, Role of Antioxidant Minerals</p> <p><b>Water</b> As a nutrient, functions,sources, requirements. Distribution Water In the body, exchange of water in the body,composition of body fluids. Water balance,factors regulating it,dehydration,water intoxication.</p>	<b>15</b>
	<b>TOTAL</b>	<b>75</b>

## COURSE OUTCOMES

After Successful Completion Of The Course,the student will be able to:

- CO1.** Define Nutrients And Terms Related To Nutrition.
- CO2.** Describe the sources,recommended allowances of macronutrients,micronutrients,and water.
- CO3.** Interpret The Significance Of Macro And Micronutrients,and water for maintenance optimum health.
- CO4.** Explain The Functions,deficiency or toxicity of macro and micronutrients,and water.
- CO5.** Evaluate the role of macronutrients, micronutrients, and water in health and

disease.

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- 7.Sizer F. S. and Whitney E. (2014) Nutrition: Concepts & Controversies. 13<sup>th</sup> Ed.,Wadsworth,CengageLearning,USA Whitney, E.R.andRolfes S.R. (1996)Understanding nutrition. 7<sup>th</sup> Ed., West PublishingCompany,USA

**E-LEARNING SOURCES:**

- <http://www.merck.com/mmhe/seciz/ch155/ch155a.html>
- <http://www.whereincity/medical/vitamins>

**Mapping with Programme Outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	L	L	M	S
CO2	S	S	S	M	M	M	L	L	M	S
CO3	S	S	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	M	L	M	M	S
CO5	S	S	S	S	M	M	L	M	M	S

**Mapping with Program Specific Outcomes**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted Percentage (rounded of) of Course Contribution to Pos</b>	3	3	3	3	3

**CORE- VI**

Title of the Course		NUTRITIONAL BIOCHEMISTRY								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC VI	III	Y				5	5	25	75	100

Learning Objectives
To enable the students to:
Study the basic concepts of metabolism of proximate principles and others.
To learn the metabolic pathways of nutritional significance.

UNIT	CONTENT	HOURS
UNIT I	<b>Biological oxidation and Enzymes-</b> Biological oxidation, Electron transport chain and Oxidative Phosphorylation. Enzymes– Definition, Types, Mechanism of action, Factors affecting enzyme activity. Coenzyme, Role of b -vitamins coenzyme. Free radicals – Definition, Formation in biological systems. Antioxidants– definition, Role of antioxidants in prevention of degenerative disorders.	15
UNIT II	<b>Metabolism of Carbohydrates</b> Classification, Glycolysis, The Citric Acid Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, The Hexose Monophosphate Shunt and bioenergetics.	15
UNIT III	<b>Metabolism of Protein</b> Classification of amino acids, Oxidative Deamination, decarboxylation, transamination and transmethylolation of amino acids, urea cycle, biosynthesis of non- essential amino acids, catabolism of essential amino acids. Protein biosynthesis.	15
UNIT IV	<b>Metabolism of Lipids</b> Classification of fatty acid, Biosynthesis of fatty acids, beta oxidation of saturated fatty acids, ketone bodies. Essential fatty acids– types and functions. Lipoproteins–classification and function. Biosynthesis of cholesterol.	15
UNIT V	<b>Intermediary Metabolism, Nucleic acid &amp; Recent concepts</b> Overview of intermediary metabolism of carbohydrates, protein and lipid. Hormonal regulation of carbohydrate, protein and fat metabolism. Structural components and functions of nucleic acid, Structure of DNA, RNA types and functions. Recombinant DNA technology, Metabolism of Xenobiotics, Nutrigenomics.	15
	<b>TOTAL</b>	<b>75</b>

## COURSE OUTCOME

**After successful completion of the course the students will be able to**

**CO1.** Describe the role of enzymes and coenzymes in biological oxidation.

**CO2.** Explain metabolism and regulation of carbohydrates, lipids and proteins.

**CO3.** Analyze The Integration Of Carbohydrate, lipid and protein metabolism

**CO4 .**Comprehend the significance of recent biochemical concepts namely xenobiotics, recombinant DNA technology and Nutrigenomics.

**CO5.**Discuss The Structure And Functions Of Nucleic Acids.

## **REFERENCES**

1. Albanese, A. (Ed.). (2012). Newer methods of nutritional biochemistry V3: With applications and interpretations. Elsevier.
2. Bettelheim, F.A., Brown, W.H., Campbell, M.K., & Farrell, S.O. (2009). General, Organic & Biochemistry. Brooks/Cole Cengage Learning.
3. Champe, P.C., Harvey, R.A., & Ferrier, D. R. (2005). Biochemistry. Lippincott Williams & Wilkins, 6<sup>th</sup> Edition, Wolters Kluwer, London.
4. Harvey, R. and Ferrier, D., Lippincott's Illustrated Reviews: Biochemistry, 6<sup>th</sup> edition, Lippincott Williams and Wilkins, Philadelphia.
5. Leininger, A.L. (1993) Biochemistry. 3<sup>rd</sup> ed. CBS Publishers, New Delhi.
6. Lieberman, M., & Ricer, R.E. (2009). Lippincott's Illustrated Q&A Review of Biochemistry. Lippincott Williams & Wilkins.
7. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): 25<sup>th</sup> Ed. Harpers Biochemistry. Macmillan worth publishers.
8. Shan mugham Ambika (1985) Fundamentals of biochemistry to medical students. NVA Bharat Printers and traders 56, Peters Road, Madras- 86.

## **E- LEARNING RESOURCES:**

- <https://www.udemy.com/share/1027yA/>
- <https://www.classcentral.com/course/swayam-biochemistry-5229>
- <https://www.classcentral.com/course/edx-biochemistry-biomolecules-methods-and-mechanisms-12585>
- <https://www.classcentral.com/course/swayam-experimental-biochemistry-12909>
- <https://youtu.be/y6YGZfcAegw>

## **Mapping with Programme Outcomes**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	M	M	M	L	L	M	S
<b>CO2</b>	S	S	S	M	M	M	L	L	M	S
<b>CO3</b>	S	S	S	S	M	M	S	M	M	S
<b>CO4</b>	S	S	S	S	M	M	L	M	M	S
<b>CO5</b>	S	S	S	S	M	M	L	M	M	S

### Mapping with Programme Specific Outcomes

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weight age</b>	15	15	15	15	15
<b>Weighted percentage (rounded of) of Course Contribution to Pos</b>	3	3	3	3	3

### ELECTIVE- III

Title Of the Course		HUMAN DEVELOPMENT								
Category	Year	L	T	P	O	Credits	Inst. Hrs	Marks		
	Sem							CIA	External	Total
Elective Course – EC 3	III	Y		Y		3	4	25	75	100

<b>Learning Objectives</b>
<b>To enable the students to:</b>
Familiarize With The Growth Process From Conception To Confinement.
Know The development of an individual from infancy to old age.
Understand the physical, psychological ,and social development of the individual from infancy to old age.
Develop an awareness of the Problems Children,adolescent,and exceptional children.



## COURSE OUTCOME

After Successful completion the student will be able to

- CO1. Describe the meaning and principles of Growth & Development
- CO2. Explain Developmental aspects during infancy, early and late childhood
- CO3. Evaluate Developmental Aspects During Adolescence.
- CO4. Identify the developmental tasks during adulthood and old age.
- CO5. Introduction to Children with Special Needs and identification & Educational Rehabilitation

### References

1. Hurlock E.B., (1972). Child Development, New York: McGraw Hill Book company.
2. Hurlock, E.B., (1995): Developmental Psychology- A Life Span Approach, 5th (Ed.) New York: McGraw Hill Book Co.
3. Nanda V.K., (1998): Principles of Child Development, New Delhi: Anmol Publications Pvt. Ltd.
4. Rajammal P. Devadas and Jaya. Muthu (2002). A Textbook of Child Development, New Delhi: Macmillan Publishers.
5. Singh, A. (2015). Foundations of Human Development: A Lifespan Span Approach. New Delhi, Orient Black Swan.
6. Suriakanthi A., (1997). Child Development – An Introduction, Tamil Nadu: Kavitha Publishers
7. Swaminathan, M (1998). The First Five Years: A Critical Perspective on Early Childhood Care and Education in India. New Delhi: Sage Publications.
8. Suriakanthi, A., (2009). Child Development. Kavitha Publications, Tamil

### e- Learning Resources

- i. [http://www.wbnsou.ac.in/online\\_services/SLM/BED/SEM-01\\_A1.pdf](http://www.wbnsou.ac.in/online_services/SLM/BED/SEM-01_A1.pdf)
- ii. <https://ncert.nic.in/textbook/pdf/kepy104.pdf>
- iii. <https://egyankosh.ac.in/bitstream/123456789/17134/1/Unit-3.pdf>
- iv. [https://www.cukashmir.ac.in/departmentsdocs\\_16/Growth%20&%20Development%20-%20Dr.%20Ismail%20Thamarasseri.pdf](https://www.cukashmir.ac.in/departmentsdocs_16/Growth%20&%20Development%20-%20Dr.%20Ismail%20Thamarasseri.pdf)

### Mapping with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	S	M	S
CO2	S	S	S	M	S	M	S	S	M	S
CO3	S	S	S	M	S	M	S	S	M	S
CO4	S	S	S	M	S	M	S	S	S	S
CO5	S	S	S	M	S	M	S	S	S	S

### Mapping with Program Specific Outcomes

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted Percentage(rounded of)of CourseContributionto Pos</b>	3	3	3	3	3

### SKILL ENHANCEMENT COURSE-4

Title of the Course		CONSUMER EDUCATION								
Category	Year	L	T	P	O	Credits	Inst t Hr s	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC- 4	III	Y		Y		1	1	25	75	100

Learning Objectives
To enable the students to:
Be familiar with the problems in buying and consumer legislations.
Become aware of marketing conditions and the means for problem redressal.
Create awareness on various consumer buying problems.

UNIT	CONTENT	HOURS
UNIT-I	<b>Consumerism and consumer buying problem</b> - Definition and the concept of consumerism– consumer, producer and market. Characteristics of consumers, role of consumers in the Indian economy. Malpractices– Incorrect weights and measures. Misleading Advertisement and Misbranding.	8
	<b>Activity:</b> Preparation of posters and creating awareness on various consumer buying problems.	2
UNIT-II	<b>Human wants Demand and Supply</b> - Definition, classification of human wants–necessities, comfort and luxuries, Meaning of demand and supply .Relation between utility, demand and supply. Factors influencing demand and supply. <b>Types of income</b> -Real, money, psychic, relationship of GNP,national income, personal income,disposable income.	8
	<b>Activity:</b> Preparing guidelines for purchasing commonly used consumer goods and services.	2

<b>UNIT -III</b>	<b>Markets and marketing</b> - Basic Concept, Classification and functions of Markets, Types of Market.Channels of Distribution:Meaning,types and their advantages and disadvantages. <b>Consumer in the market</b> - Consumer buying habits, buying motives and buying problems. <b>Consumer Aids</b> a. Brand–Different types and its importance. b. Labels– Importance ,Merits and demerits .Importance of Packaging and Advertising.	<b>15</b>
	<b>Activity:</b> Illustrate different types of consumer aids.	<b>5</b>
<b>UNIT -IV</b>	<b>Quality Assessment of Products</b> -Definition–Standards and standardization and its Importance. Quality Seal– BIS, ISI, AGMARK, ISO, HALLMARK, BEE LABEL and FPO	<b>8</b>
	<b>Activity:</b> Identify government agencies in protecting the consumer.	<b>2</b>
<b>UNIT -V</b>	<b>Consumer decision making process</b> - Types of consumer decisions, process of decision making, factors determining and influencing consumer behavior, guidelines for wise buying practices. <b>Consumer Protective Services</b> -Consumer Protection Act, Food Adulteration Act– FSSAI. Quality control and in section Act. Consumer Rights and consumer responsibilities.	<b>8</b>
	<b>Activity:</b> Identify a consumer problem and solve it using decision making steps.	<b>2</b>
	<b>Total</b>	<b>60</b>

### COURSE OUT COME

**After successful completion of the course the student will be able to:**

**CO1.** Identify the major influences on consumer behavior.

**CO2.**Analyze the implications of demand and supply.

**CO3.**Implement wise buying practices.

**CO4.**Explain consumer protection legislations and standards.

**CO5.**Assess the quality of a product based on the knowledge

gained

### REFERENCES:

1. Gupta,C.B.andNair,R.N(2004).MarketingManagement:SultanChandandSons,
2. Juliana,M(2011).Green consumerism,UnitedStates:SAGEPublishers.
3. Kathiresan,S.Radha,V(2004),Marketing:Chennai,PrasannaPublisher.
4. Kumar,N.,(1999),ConsumerProtectioninIndia,Delhi,HimalayaPublishingHouse.

5. Pattanchetti, C.C. and Reddy, 2002). Principles of Marketing, Coimbatore: Rainbow Publishers, India.
6. Seetharaman, P. and Sethi, M. (2001). Consumerism: Strategies and Tactics, CBS Publishers and Distributors, New Delhi.
7. Steven, D.S, (2016). Consumer Economics: A Practical Overview”, New York: Routledge Taylor and Francis group.
8. Suja Nair (2002). Consumer Behaviour: New Delhi. Sultan Chand and Sons.

#### E-LEARNING RESOURCES:

- <http://www.jagorahakjago.com/consumer-rights/>
- <https://consumeraffairs.nic.in/organisation-and-units/division/bureau-indian-standards>
- <https://www.consumer-voice.org/food/know-your-quality-marks/>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=120087>

#### Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	L	S	S	S	S
CO2	S	S	S	S	S	M	M	S	S	S
CO3	S	S	S	S	M	M	S	S	S	M
CO4	S	S	M	M	S	M	S	S	M	S
CO5	S	S	S	S	S	M	S	S	S	S

#### Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted Percentage (rounded of) of Course Contribution to Pos</b>	3	3	3	3	3

### SKILL ENHANCEMENT COURSE- 5

Title Of the Course		FUNDAMENTALS OF RESEARCH IN NUTRITIONAL SCIENCES								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC – 5	III	Y				2	2	25	75	100

<b>Learning Objectives</b>
<b>To enable the students to:</b>
Understand Basic Concepts of Research Methodology.
Use Simple Statistical Methods for Analysis of Data.
Develop Skills to carry out a project and present a report

UNIT	CONTENT	HOURS
<b>UNIT I</b>	<b>Introduction To Research</b> Research-Meaning, objectives, significance. Research problem-Definition and selection of research problems. Research Design–Types of research design. Method Of Sampling-probability and non-probability. Sampling–Merits and demerits. Determining Sample size	<b>15</b>
<b>UNIT II</b>	<b>Data Collection</b> Primary Secondary Data, selection of appropriate methods for data collection. Tools Used for Data Collection-Questionnaire and Interview schedule.	<b>10</b>
<b>UNIT III</b>	<b>Coding And Tabulation of Data</b> Data entry and computation, Tabulation of Data –parts of the table Presentation Of Data, use of bar graph and pie chart	<b>10</b>
<b>UNIT IV</b>	<b>Basic statistical tools for analysis and interpretation</b> Measures of central tendency – Mean, Median, Mode. Variations-the range and standard deviation. Correlation–Karl Pearson’s coefficient of correlation Test Significance, Student’s t test	<b>15</b>
<b>UNIT V</b>	<b>Report Writing</b> Steps in report writing, Layout of a report. Bibliography-citing references- anyone style.	<b>10</b>
	<b>EXPERIENTIAL LEARNING</b> Carryout a small survey, code and tabulate data and present data using tables and graphs. Interpret data using simple statistical tools and present reports following rules for report writing.	
	<b>TOTAL</b>	<b>60</b>

## COURSE OUTCOMES

**After Successful Completion of the course, the student will be able to:**

- CO1.** Define terms associated with conduct of research.
- CO2.** Explain research design, methods of research, collection, tabulation and presentation of data.
- CO3.** Choose a sampling method and identify the appropriate statistical methods.

**CO4.**Analyze the Data and Draw Conclusions.

**CO5.** Evaluate data, draw inferences and prepare a report.

**REFERENCES:**

1. Goode, WJ and Hatt, PK (1981)Methods in Social Research, McGraw Hill International Editions, Sociology Series.
2. Gupta, S.P.(2019)Statistical Methods.46th.Sultan Chand and Co, New Delhi.
3. Kerlinger F. N. and Lee, H.B. (2000) Foundations of Behaviour A Research 4<sup>th</sup>Ed.HarcourtCollegePublishers.
4. Kothari, C.R. (2019). Research methodology methods and techniques, New Age International publishers, New Delhi.
5. Kumar, R. (2005) Research Methodology: A Step-by-Step Guide for Beginners. Sage Publications, New Delhi.

**E-LEARNING RESOURCES:**

- <http://www.socialresearchmethods.net/tutorial/mugo/tutorial.html>
- [https://ebooks.lpude.in/library\\_and\\_info\\_sciences/MLIS/year\\_1/DLIS401\\_METHODOLOGY\\_OF\\_RESEARCH\\_AND\\_STATISTICAL\\_TECHNIQUES.pdf](https://ebooks.lpude.in/library_and_info_sciences/MLIS/year_1/DLIS401_METHODOLOGY_OF_RESEARCH_AND_STATISTICAL_TECHNIQUES.pdf)
- <https://mfs.mkcl.org/images/ebook/Fundamental%20of%20Research%20Methodology%20and%20Statistics%20by%20Yogesh%20Kumar%20Singh.pdf>

**Mapping with Program Outcomes**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO4</b>	<b>PO 5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	M	S	M	M	M	S	M	M	M	S
<b>CO2</b>	S	S	S	S	M	S	L	S	M	S
<b>CO3</b>	S	S	S	S	M	M	S	S	M	S
<b>CO4</b>	S	S	S	S	M	M	L	M	M	S
<b>CO5</b>	S	S	S	S	S	S	S	M	M	S

### Mapping with Program Specific Outcomes

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO 3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage (rounded of) of Course Contribution to Pos</b>	3	3	3	3	3

### SEMESTER IV

Title of the Course		NUTRITION THROUGH LIFE CYCLE								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC – VII	IV	Y		Y		4	4	25	75	100

Learning Objectives
To enable the students to:
Understand the role of nutrition in the growth and development through the life cycle.
Gain insight into the principles of effective meal planning.
Understand The Nutritional Needs Of Various age groups
Acquire skills to plan diets for various age groups across the lifecycle.

UNIT	CONTENT	HOURS
UNIT I	<b>Introduction to meal planning</b> - Balanced diet, food groups, Food Guide Pyramid (ICMR), Food Plate, RDA, factors affecting RDA. Principles of meal planning– steps involved in planning a diet. <b>Nutrition for Adult-</b> Nutritional requirements, planning balanced diets for adult men and women, promoting healthy lifestyle through holistic approach.	15
UNIT II	<b>Nutrition During Pregnancy-</b> Physiological Demands Of Pregnancy, nutritional needs, effect of nutrition on pregnancy outcome, optimal weight gain, nutrition related problems in pregnancy, complications of pregnancy. <b>Nutrition during lactation-</b> Physiology of lactation, nutritional requirements, concerns of breast- feeding mothers.	15
UNIT III	<b>Nutrition during infancy-</b> Growth and development, growth standards, food and nutritional requirements, breast feeding, artificial feeding, low birthweight babies, complementary feeds. <b>Nutrition for preschool children-</b> Growth and development, food and nutritional requirements, eating habits and food behaviors, nutrition related problems -PEM, VAD and their dietary interventions.	20
UNITIV	<b>Nutrition for school children-</b> Growth pattern, nutritional requirement, importance of healthy snacks, factors affecting eating habits, school lunch. <b>Nutrition during adolescence-</b> Growth and development, nutritional requirements, food habits, nutritional problems –obesity, underweight, anaemia, menstrual problems and eating disorders.	15
UNITV	<b>Nutrition for old age</b> - Physiological changes in elderly, food and nutritional requirements, nutritional and health concerns in old age, healthy lifestyle.	10
	<b>TOTAL</b>	<b>75</b>

## COURSE OUTCOMES

**After Successful Completion Of the course the student will be able to**

- CO1.** Explain the physiological basis for nutritional needs through the human lifecycle
- CO2.** Identify nutrition related concerns and deficiency disorders at every stage of lifecycle
- CO3.** Discuss appropriate dietary guidelines for various age groups
- CO4.** Develop indigenous, value added and low cost complementary feeds.
- CO5.** Demonstrate skills to plan and prepare appropriate and sustainable diets for deficiency diseases

## REFERENCE BOOKS

1. Srilakshmi B. (2011) Dietetics, sixth edition, New Age Publishing Press, New Delhi.
2. Gopalan, C., Ramanathan, P.V. Balasubramanian, S.C. (2001) Nutritive value of Indian Foods, NIN, Hyderabad.

3. Longvah T, Ananthan R, Bhaskar K, Venkaiah K. (2017) Indian Food Composition Tables, National Institute of Nutrition.
4. Abraham S, Nutrition through Lifecycle. (2016) 1st edition, New Age International Publishers, New Delhi.
5. Stacy N, William's Basic Nutrition and Diet Therapy. (2005) 12th edition, Elsevier Publications, United Kingdom.
6. Whitney EN and Rolfes S Understanding Nutrition. (2002) 9th edition West/Wadsworth, London.
7. Groff JL, Gropper, Advanced Nutrition and Human Metabolism. (2000) 3rd edition, West/ Wadsworth, United Kingdom.
8. Groff JL, Gropper SS, Advanced Nutrition and Human Metabolism. (2000) 3rd edition, West/ Wadsworth, United Kingdom.
9. Cataldo, DeBruyne and Whitney, Nutrition & Diet therapy – Principles and Practice. (1999) 5th edition, West/ Wadsworth, LONDON

### e-LEARNING RESOURCES

- <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/dietary-guideline-1>
- <https://www.nhp.gov.in/healthyliving/healthy-diet>
- <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
- <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/diet-for-children-and-adolescent>
- <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
- <https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

### Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	M	S	M	S	S
CO2	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	S	M	S	S

### Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage (rounded off) of Course Contribution to Pos</b>	3	3	3	3	3

### CORE- VIII

Title of the Course		NUTRITION PRACTICAL								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC VIII	IV			Y		5	5	25	75	100

#### Learning Objectives

To enable the students to:

Acquire skills to assess nutritional status, plan diets for various age groups and deficiencies.

Understand the various analytical techniques in nutrition.

Develop Analytical Skills Required In Food and Nutrition research.

<b>UNIT</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>UNIT I</b>	1. Assessment of Nutritional Status <ol style="list-style-type: none"> <li>a. -Body Composition parameters</li> <li>b. -Circumference measurements</li> <li>c. -Clinical signs</li> <li>d. -Dietary assessment</li> </ol> 2. Planning and preparation of diets for deficiency diseases <ol style="list-style-type: none"> <li>a. PEM</li> <li>b. Vitamin A deficiency</li> <li>c. Nutritional anemia</li> </ol>	<b>15</b>
<b>UNIT II</b>	1. Planning and preparation of diets for the following <ol style="list-style-type: none"> <li>a. Complementary feed</li> <li>b. Preschool Child</li> <li>c. School going children</li> <li>d. Adolescents</li> <li>e. Adult</li> <li>f. Expectant mother</li> <li>g. Nursing mother</li> <li>h. Oldage</li> </ol>	<b>15</b>
<b>UNIT III</b>	1. Ashing of food and preparation of ash solution <ol style="list-style-type: none"> <li>a. Estimation of Iron in food</li> <li>b. Estimation of moisture content of foods</li> <li>c. Estimation of calcium in food</li> </ol> 2. Estimation of Vitamin C by Titrimetric method	<b>20</b>
<b>UNIT IV</b>	1. Quantitative estimation <ol style="list-style-type: none"> <li>a. Reducing sugar.</li> <li>b. Determination of Iodine and acid value in oil/fat</li> </ol> 2. Qualitative tests for sugars-glucose, fructose, lactose, maltose and galactose.           3. Qualitative tests for proteins.	<b>15</b>
<b>UNIT V</b>	1. Demonstration Experiments. Determination of content in food using Soxhlet method.           2. Estimation of protein content in food by the kjeldahl method           3. Estimation of total nitrogen in foods (Micro or Macro kjeldahl methods )           4. Visit to a food analytical lab	<b>10</b>
	<b>TOTAL</b>	<b>75</b>

## COURSE OUTCOME

After Successful Completion Of The Course, the student will be able to:

- CO1.** Assess nutritional status of individuals, community and plan diets for deficiency diseases.
- CO2.** Develop skills to determine adequacy of nutrient intake, plan diets for different age groups.
- CO3.** Estimate nutrient content of selected foods with appropriate laboratory procedures.
- CO4.** Identify appropriate laboratory procedures suited for qualitative and quantitative experiments.
- CO5.** Acquire knowledge on laboratory experiments performed in food analytical lab.

## REFERENCES:

1. Oser, D.I. (1979) Hawk's Physiological Chemistry. Tata-McGrawHill Publishing Co., New Delhi
2. Plummer, D.T. (1987) Introduction to Practical Biochemistry. Tata-McGraw Hill Publishing Co., New Delhi
3. Raghuramulu, N., Nair, K.M. and Kalyanasundaram, S. (1983) A Manual of Laboratory
4. Sharma, B.K. (1999). 8th Ed. Instrumental Methods of Chemical Analysis. Gel Publishing House.
5. Srivastava, A.K. and Jain, P.C. (1986). 2<sup>nd</sup>, Ed. Chemical Analysis: An Instrumental Approach. S Chand and Company Ltd.
6. Techniques. NIN, Hyderabad
7. Varley, H.; Gowenlock, A.H. and Bell, M. (1980). 5<sup>th</sup> ed. Practical Clinical Biochemistry. Heinemann Medical Books Ltd.
8. Winton, A.L. and Winton, K.B. (1999). Techniques of Food Analysis. Allied Scientific

## E-LEARNING RESOURCES:

<http://www.merck.com/mmhe/seciz/ch155/ch155a.html>

<http://www.whereincity/medical/vitamin>

## Mapping with Program Outcomes

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	L	S	M	S	L	M	L	S	S
<b>CO2</b>	S	L	S	M	S	L	M	L	M	S
<b>CO3</b>	S	L	S	S	S	L	L	M	M	S
<b>CO4</b>	S	L	S	M	S	L	L	M	M	S
<b>CO5</b>	S	L	S	S	S	L	L	M	M	S

## Mapping with Program Specific Outcomes

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted Percentage(rounded of) ofCourse Contribution to Pos</b>	3	3	3	3	3

Title of the Course		FOUNDATIONS OF BAKING AND CONFECTIONERY					
Category	Year	SUBJECT CODE	Credits	Inst Hrs	Marks		
	Sem				I CA	External	Total
Elective Course	IV	24CNF4A	4	(3+1)	25	75	100

Learning Objectives
To enable the students to:
Gain insight into the planning and operation of the bakery unit.
Familiarize with the equipment and tools,hygienic practices relating to banking
Understand Role Of Various ingredients used in the making of breads,cakes,cookies, pastries and various confectioneries
Acquire skills in baking and confectionery with an emphasis on special dietary needs.

UNIT	CONTENT	HOURS
UNIT I	<p><b>An Overview of Bakery Industry</b>            Current Status And Growth Of bakery industry India. Baking–principles, process. Layout and organization a bakery unit. Equipment And tools used in baking and confectionery. Bakery sanitation and personal hygiene.</p>	10
UNIT II	<p><b>Ingredients in Bakery and Confectionery</b>            Ingredients - Flour, Sugar, Shortenings, Egg, Leavening agents-yeast, baking soda, baking powder, chocolate cocoa powder. Other Ingredients- salt, milk and milk derivatives, malt products, dough improver, oxidizing agents, flavours and colors, nuts, spices and condiments, preserved and candied fruit peels.</p>	10
UNIT III	<p><b>Breads and Cakes</b>  <b>Bread</b>-ingredients, type of breads, faults and its prevention.  <b>Cakes</b>–ingredients, types of cakes, <b>cake judging</b>, faults and remedies.  <b>Modified baked goods</b> – using alternative healthy ingredients for special dietary needs. Different types and techniques of cake decoration -icings and fillings.</p>	15
UNIT IV	<p><b>Pastries, Cookies and Biscuits</b>  <b>Pastries</b>- types of pastries- puff pastry, short crust, phyllo pastry, flaky pastry, choux pastry. <b>Cookies Biscuits</b>–ingredients, types and processing.</p>	10
UNIT V	<p><b>Confectionery and Marketing of Baked Products</b>            Chocolates- production, types, chocolate decoration Sugarbased confectionery–fudge, fondant, sugar candies. <b>Marketing And Sales Promotion-costing</b>, packaging and labeling.</p>	10

Title of the Course		FOUNDATION OF BAKING AND CONFECTIONERY - PRACTICAL								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC VIII	IV			Y		5	5	25	75	100

S.NO	PRACTICAL:	
1.	Preparation Of Buns,rolls, soup sticks,rusk and pizza base.	20
2.	Preparation of angel food cake,butter cake,spongecake, chocolate cake,cupcake, fruitcake and icing on the cake.	
3.	Modified Baked Products-high fiber,low/alternate sugar,low fat,gluten free, and millet based bakery products for special nutritional requirements.	
4.	Preparation Of Biscuits,cookies.	
5.	Preparation Of Pastries - Shortcrust Pastry,flaky pastry,puff pastry,choux pastry.	
6.	Preparation Of Plain chocolate,fudge,fondant and candies.	
	<b>TOTAL</b>	<b>75</b>

## **COURSE OUT COMES**

**After successful completion of the course the student will be able**

**TO CO1.** Understand the principles and process of baking and confectionery.

**CO2.** Acquire knowledge on role of various ingredients used in baking and confectionery.

**CO3.** Develop skills to design baked goods using alternative healthy ingredients to cater special dietary needs.

**CO4.** Acquire skill to bake pastries, cookies and biscuits.

**CO5.** Enhance entrepreneurial skills in bakery and confectionery to establish a bakery unit.

## **REFERENCES**

1. John Kingslee (2006) A Professional Text book to Bakery and Confectionery. New Age International Pvt Limited Publisher, New Delhi
2. Uttam K Singh (2011). Theory of Bakery and Confectionery - An Operational Approach. Kanishka Publishers and Distributors, New Delhi.
3. Yogambal Ashokkumar (2012) Theory of Bakery and Confectionery, Phi Publication. New Delhi.
4. Nicoletto, I. and Foote, R (2000). Complete Confectionery Techniques. Hodder and Stoughton, London.
5. Bakers Hand Book on practical Baking (2000) Published by U.S. Wheat Associates New Delhi.
6. Dubey, S.C (2002) Basic Baking. 4<sup>th</sup> Edition. Published by the Society of Indian Bakers, New Delhi.
7. Sarah R. Levensky, Priscilla et al., (2004) Textbook of Baking and Pastry Fundamentals, third edition, Pearson Education Ltd.
8. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, John Wiley & Sons, Inc New Jersey. 2009.

## **E- LEARNING RESOURCES**

<https://www.youtube.com/watch?v=dfvklBBO2g>

<https://www.lifestyleasia.com/ind/food-drink/dining/bookmark-the-best-baking>

[-youtube- channels-to-bake-like-a-pro/Ø](#) [www.bakels.in](http://www.bakels.in)

### Mapping with Program Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10
CO1	S	S	S	S	M	S	M	M	M	S
CO2	S	S	S	S	M	M	S	M	M	S
CO3	S	S	S	S	S	S	S	M	S	S
CO4	S	S	S	M	M	M	L	L	M	S
CO5	S	S	S	S	S	M	S	S	S	S

### Mapping with Program Specific Outcome

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weighted percentage	15	15	15	15	15
(rounded) of course contribution to pos	3	3	3	3	3

### SKILL ENHANCEMENT-VI

Title of the Course		PRE-SCHOOL AND CRECHE MANAGEMENT								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC - 6	IV	Y		Y		2	2	25	75	100

Learning Objectives
To enable the students to:
To familiarize the students with the Significance of managing the crèche and preschool
Understand the elements involved in organization and management of creche and Preschool.
Create awareness of functions of various authorities dealing with crèche and preschool.

UNIT	CONTENT	HOURS
UNIT I	<b>Concept and organization of Creche and Preschool</b> Crèche and preschool -Meaning, types of preschools, need, importance of organization, Elements of organization and administration. Difference between crèche and preschool, Preschool Programme - Principles of preschool programme, Framing of preschool curriculum – types of curriculum, planning activities for children, audio- visual aids for children and its importance, Activities for children: Audio- visual aid for children and its importance.	8
	<b>Practical</b> - Planning the layout of Creche and Preschool, Planning cyclic menu for a preschool and crèche	2
UNIT II	<b>Resource Management</b> Location, site and building, Types of rooms, Storage facilities, arrangement of room (activity centres), ventilation, lighting and safety, Provision of safe drinking water and sanitary facilities, Playground and safety aspects – indoor and outdoor games, Play equipment – types, criteria for selection, Maintenance of building- store, furniture, equipment Suggestive Low-Cost Educational Material- Teaching Aids.	8
	<b>Practical</b> - Analysing the availability and suitability of play materials Preparation of First Aid Box.	2

<b>UNIT III</b>	<b>Records and registers</b> Need, importance and maintenance of records and registers. Types of records (Important records)– Admission, Progress, Financial, Equipment, Correspondence, Health - sickness of child and immunization. Types of register - Attendance (Staff, children), Accounts, Stock, Staff Profile, services for children and daily diary. Methods of maintaining record of children– Cumulative and Anecdotal.	<b>12</b>
	<b>Practical-</b> Case study of a child- Socio- economic profile, Demographic details, Maintaining an activity dairy, Diet-meal pattern, health status Preparation and maintaining a health record file.	
<b>UNIT IV</b>	<b>Planning of Pre- school Education Activities :</b> Skills & qualities of preschool children Introductory Games/activities for Rapport Building with Children. <b>Physical &amp; Motor Development</b> -Gross Motor &Fine Motor Skills Essentials of Optimum Physical Development Activities / Games for Gross and Fine Motor Skills <b>Cognitive Development</b> - Essentials for Cognitive Development. Development of Basic Skills – Activities for Sensory Development, Mental Skills and Concept Development <b>Language Development</b> – Essentials for Language Development Games/ Exercises for Language Development Activities for Language Development - Listening Skills, Reading Skills and Writing Skills. <b>Development of Science Experience &amp; Creative Expression</b> -Areas of Creative Expression Science Experience Activities <b>Social &amp; Emotional Development</b> Essentials for Social & Emotional Development Activities and games for Social-Emotional Development Games for Socio-Emotional Development.	<b>15</b>
	<b>Practical-</b> Planning activities for children based on the curriculum of the preschool and crèche	<b>2</b>
<b>UNIT V</b>	<b>Personnel Management</b> Role and qualities of teacher and care - taker and other staff involved in welfare and care of children, Teacher- child ratio, Need for and importance of in- service training	<b>4</b>
	<b>Practical</b> - Organization chart for Creche and Preschool, Collection of different records and registers to be maintained in a preschool and crèche	<b>2</b>
	<b>TOTAL</b>	<b>60</b>

## **COURSE OUTCOME**

**After successful completion of the course the student will be able to**

**CO1.** Describe key Concept and organization of Creche and Preschool

**CO2.** Explain Resource Management for creche and preschools

**CO3.** Understand the criteria for Records and registers maintenance

**CO4.** Identify importance and Planning of Preschool Education Activities

**CO5.** Introduction to Personnel Management required for creche and preschools

## **Reference**

1. Ax line, V.M. (1964). Dibs in search of self. New York: Ballantine Books 754
2. Clarke, P. (2001). Teaching & learning: the culture of pedagogy. New York: Sage
3. Thomson, C.L., Holmberg, M.C., Baer, D.M., Hodges, W. L., and Moore, S. G. (1978). An Experimental Analysis of Some Procedures to Teach Priming and Reinforcement Skills Preschool Teachers. Monographs of the Society for Research in Child Development. 43 (4), pp 1-86.
4. Jaya, N., & Jayapoorani. N. (2004). Participation in a nursery school – Laboratory manual for students. Coimbatore: Sarada Laya.
5. Tileston, D. W. (2005). Training Manual for Every Teacher, Chennai: Sage.
6. TN Forces and IAPE, (2000). Pre- school Curriculum, Activity based developmentally appropriate curriculum for preschoolers. Chennai

### **e. Learning Resources**

- [https://ddceutkal.ac.in/Syllabus/MA\\_Education/Paper\\_19.pdf](https://ddceutkal.ac.in/Syllabus/MA_Education/Paper_19.pdf)
- [https://wcd.nic.in/sites/default/files/national\\_ece\\_curr\\_framework\\_final\\_03022014%20%282%29.pdf](https://wcd.nic.in/sites/default/files/national_ece_curr_framework_final_03022014%20%282%29.pdf)
- <https://scert.kerala.gov.in/wp-content/uploads/2020/06/07-creche%20and%20preschool.pdf>

### Mapping with Programme Outcomes

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	M	S	M	S	S	M	S
<b>CO2</b>	S	S	S	M	S	M	S	S	M	S
<b>CO3</b>	S	S	S	M	S	M	S	S	M	S
<b>CO4</b>	S	S	S	M	S	M	S	S	S	S
<b>CO5</b>	S	S	S	M	S	M	S	S	S	S

### Mapping with Programme Specific Outcomes

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage (rounded of) of Course Contribution to Pos</b>	3	3	3	3	3

## SKILL ENHANCEMENT-VII

Title Of the Course		COMPUTER APPLICATION IN HOME SCIENCE									
Category	Year	II	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem	IV							CIA	External	Total
Skill Enhancement Course SEC-7	IV		Y		Y		2	2	25	75	100

### Learning Objectives

To enable the students to:

Understand the application computer in various disciplines HomeScience.

Know the features of Autocad software used in Textiles & Interior Design.

Explore the benefits of computer applications in the field of research.

UNIT	CONTENT	HOURS
UNIT I	<b>General Commands-</b> Creating and opening a file,Steps in creating a folder and saving a file in the destined folder. <b>MS Office Package-</b> Software in MS Office package, creating a document using MS Word, preparing slide presentations using MS PowerPoint. Making Graphs and Charts using MS office.	5
UNIT II	<b>Computer Application in Space planning</b> - AutoCAD in Interior Design - Need, Purpose and merits. Application – Preparing Plan, Elevation and section drawings for interiors and exteriors. Need for rendered views in design.Creating 3D models and 3D views using Google Sketchup.Advantages Of Software In Design Field.	8
UNIT III	<b>Computer Application in Nutrition</b> - Software package in nutrition education and diet counseling- Patient’s health record, Nutritive value of food items, Nutritional analysis, Meal planning and recipes, Types of nutrition Software – Nutrium, Nutrition maker, Nutritionist pro, Nutritics, Coreplus. Benefits of Nutrition Software’s to Nutritionists and Clients.	5
UNIT IV	<b>Computer Application in Textiles</b> - AutoCAD in Textile Designing – Definition, Concept, Application of CAD–Sketching, Pattern making, grading patterns, Making markers, Apparel production.Types of Textile CAD software Woven Textiles, Knitted Fabrics, Printed fabrics, Sketch Pad system, Texture mapping, Embroidery system, Apparel industry and computer. Advantages of Textile CAD.	7
UNIT V	<b>Computer Application in Research-</b> Data collection– creating online form using Google forms, Data entry in MS Excel and data analysis using SPSS – Frequency analysis, Cross Tabulation, Chi-Square, T – test, ANOVA and Correlation Co-efficient. Export and saving results in Word document. Creating Tables.	5
	<b>Total</b>	<b>30</b>

## COURSE OUTCOMES

**After Successful Completion of the course the Student will be able to:**

**CO1:**Recall the features of MS Office package.

**CO2:** Understand the application of AutoCAD for design.

**CO3:**Explain computer applications in the field of Nutrition.

**CO4:**Create textile design patterns using TextileCAD

**CO5:**Analyze research data using appropriate software and interpret results.

**REFERENCES:**

1. AutoCAD2018 for Novices(LearnByDoing),CADSoftTechnologies.
2. CAD Practical Skills in Textile Technology and Design (TTD),PatienceChitura,2020.
3. Microsoft Office365 for Beginners2022:[8 in1]TheMost UpdatedAll-in-One Guide from Beginner to Advanced | Including Excel, Word, PowerPoint, OneNote, One Drive, Outlook, Teams and Access,James Holler.
4. SPSS Statistics for Data Analysis and Visualization, Jesus Salcedo, Wiley Publishers,2017.

**E-LEARNING RESOURCES:**

- <https://www.tutorialspoint.com/word/index.htm>
- <https://www.vmaker.com/tutorial-video-hub/microsoft-tutorial-videos/microsoft-office-tutorial/>
- <https://www.thesourcecad.com/autocad-tutorials/>
- <https://nutrium.com/blog/why-should-you-choose-a-nutrition-software-over-an-excel-word/>

**Mapping with Program Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	M	S	M	L	S	S	S	M	M	S
<b>CO2</b>	S	S	S	S	M	S	L	M	M	S
<b>CO3</b>	S	M	S	S	M	S	M	S	M	S
<b>CO4</b>	S	M	S	S	M	S	S	S	S	S
<b>CO5</b>	S	S	S	S	S	S	M	S	S	S

**Mapping with Program Specific Outcomes**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	2	3	3	2
<b>CO4</b>	3	3	3	3	2
<b>CO5</b>	3	3	3	3	2
<b>Weightage</b>	15	14	15	15	12
<b>Weighted Percentage(rounded of) ofCourseContributiontoPos</b>	3	3	3	3	2

