BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI - 620 024.

B.Sc. HOME SCIENCE , NUTRITION AND DIETETICS

CHOICE BASED CREDIT SYSTEM –

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(Applicable to the candidates admitted from the academic year 2025-26 onwards)

Sem.	Part	Course	Title	Ins. Hrs.	Credit	Exam Hours	Marks		Total
							Int.	Ext.	
I	I	Language Course – I Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - I		6	3	3	25	75	100
	III	Core Course – I (CC)	Food Science	5	5	3	25	75	100
		Core Practical – I (CP)	Food Science	4	4	3	40	60	100
		First Allied Course – I (AC)	Human Physiology	4	4	3	25	75	100
		First Allied Practical (AP)	Human Physiology and Food Chemistry	3	-	-	-	-	-
	IV	Value Education		2	2	3	25	75	100
	TOTAL			**30**	**21**	**-**	**-**	**-**	**600**
II	I	Language Course - II Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - II		6	3	3	25	75	100
	III	Core Course – II (CC)	Principles of Nutrition	5	5	3	25	75	100
		Core Practical – II (CP)	Principles of Nutrition	4	4	3	40	60	100
		First Allied Practical (AP)	Human Physiology and Food Chemistry	3	2	3	40	60	100
		First Allied Course – II (AC)	Food Chemistry	4	4	3	25	75	100
		Add on Course – I ##	Professional English – I	6*	4	3	25	75	100
	IV	Environmental Studies		2	2	3	25	75	100
	TOTAL			**30+6***	**27**	**-**	**-**	**-**	**800**

III	I	Language Course – III Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - III		6	3	3	25	75	100
	III	Core Course – III (CC)	Nutrition Through life cycle	5	5	3	25	75	100
		Core Practical - III (CP)	Nutrition Through life cycle	4	4	3	40	60	100
		Second Allied Course – I (AC)	Food Microbiology	4	4	3	25	75	100
		Second Allied Practical (AP)	Food Microbiology and Nutritional Biochemistry	3	-	-	-	-	-
		Add on Course – II ##	Professional English - II	6*	4	3	25	75	100
	IV	Non-Major Elective I @ - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level **or** b) Special Tamil if Tamil language was studied upto 10th & 12th std.	Food Product Development	2	2	3	25	75	100
	TOTAL			**30+6***	**25**	**-**	**-**	**-**	**700**
IV	I	Language Course –IV Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course – IV		6	3	3	25	75	100
	III	Core Course - IV (CC)	Dietetics	5	5	3	25	75	100
		Core Practical - IV (CP)	Dietetics & Dietary Internship	4	4	3	40	60	100
		Second Allied Practical – I (AP)	Food Microbiology and Nutritional Biochemistry	3	2	3	40	60	100
		Second Allied Course – II (AC)	Nutritional Biochemistry	4	4	3	25	75	100
	IV	Non-Major Elective II @ - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either Basic Tamil if Tamil language was not studied in school level **or** Special Tamil if Tamil language was studied upto 10th & 12th std.	Consumer Education	2	2	3	25	75	100
	TOTAL			**30**	**23**	**-**	**-**	**-**	**700**

V	III	Core Course - V (CC)	Food Processing and Preservation	5	5	3	25	75	100
		Core Course – VI (CC)	Food Service Management	5	5	3	25	75	100
		Core Course – VII (CC)	Textiles and Clothing	5	5	3	25	75	100
		Core Practical -V (CP)	Food Service Management and Food Preservation and Processing	4	4	3	40	60	100
		Major Based Elective – I (Any one)	1.Community Nutrition 2.Home Science Extension and Communication	5	4	3	25	75	100
	IV	Skill Based Elective I	Basics in Research and Computer Applications in Home Science	4	2	3	25	75	100
		Soft Skills Development		2	2	3	25	75	100
	TOTAL			**30**	**27**	**-**	**-**	**-**	**700**
VI	III	Core Course - VIII (CC)	Human Development	6	5	3	25	75	100
		Core Course - IX (CC)	Principles of Resource Management and Interior Design	6	5	3	25	75	100
		Core Practical – VI (CP)	Principles of Resource Management and Interior Design	4	4	3	40	60	100
		Major Based Elective – II (Any one)	1. Food Safety and Quality Control 2.Bakery and Confectionery	5	4	3	25	75	100
		Project	Project	4	3	-	20	80	100
	IV	Skill Based Elective – II	Fundamentals of Entrepreneurship Development	4	2	3	25	75	100
	V	Gender Studies		1	1	3	25	75	100
		Extension Activities **		-	1	-	-	-	-
		TOTAL		**30**	**25**	**-**	**-**	**-**	**700**
GRAND TOTAL				**180+12***	**148**	**-**	**-**	**-**	**4200**

$ For those who studied Tamil upto 10th +2 (Regular Stream).

+ Syllabus for other Languages should be on par with Tamil at degree level.

Those who studied Tamil upto 10th +2 but opt for other languages in degree level under Part- I should study special Tamil in Part – IV.

The Professional English – Four Streams Course is offered in the 2nd and 3rd Semester (only for 2022-2023 Batch) in all UG Courses. It will be taught apart from the Existing hours of teaching / additional hours of teaching (1 hour /day) as a 4 credit paper as an add on course on par with Major Paper and completion of the paper is must to continue his / her studies further. (As per G.O. No. 76, Higher Education (K2) Department dated: 18.07.2020).

* The Extra 6 hrs / cycle as per the G.O. 76/2020 will be utilized for the Add on Professional English Course.

@ NCC Course is one of the Choices in Non-Major Elective Course. Only the NCC cadets are eligible to choose this course. However, NCC Course is not a Compulsory Course for the NCC Cadets.

** Extension Activities shall be outside instruction hours.

SUMMARY OF CURRICULUM STRUCTURE OF UG PROGRAMMES

Sl. No.	Part	Types of the Courses	No. of Courses	No. of Credits	Marks
1.	I	Language Courses	4	12	400
2.	II	English Courses	4	12	400
3.	III	Core Courses	9	45	800
4.		Core Practical	6	24	700
5.		Allied Courses I & II	4	16	400
6.		Allied Practical	2	4	200
7.		Major Based Elective Courses	2	8	200
8.		Add on Courses	2	8	200
9.		Project	1	3	100
10.	IV	Non-Major Elective Courses (Practical)	2	4	200
11.		Skill Based Elective Courses	2	4	200
12.		Soft Skills Development	1	2	100
13.		Value Education	1	2	100
14.		Environmental Studies	1	2	100
15.	V	Gender Studies	1	1	100
16.		Extension Activities	1	1	--
	Total		**43**	**148**	**4200**

PROGRAMME OUTCOMES:

1. Display skills, promote and apply scientific knowledge in the various fields of Home Science ensuring progressive development of the individual and able to find sustainable solution to solve the issues pertaining to the community/Industry.
2. Identify, analyze and formulate novel ideas to enhance holistic development with multidimensional perspectives of Home Science utilizing the principles and its applications.
3. Demonstrate advanced comprehensive knowledge with distinct technical attributes relating to the key concepts and principles of scientific phenomenon and their applications in day-to-day life upholding professional code of ethics and values.
4. Create citizens with problem solving, decision making and communication skills to effectively interact with all stakeholders ensuring individual progress and career advancement at the National and Global levels.
5. Acquire real time experience through demonstrations, internship and project for further career prospects.
6. Enrich ethnicity and cultural practices through the conceived concepts and flourish as women entrepreneurs and leaders.

7. Design solutions for complex problems and design components or processes that meet the specific needs with appropriate consideration for public health and safety, societal and environmental conditions
8. Creating genuine concern for society and environment that culminates in purposeful extension and outreach activities to inculcate social citizenship.

PROGRAMME SPECIFIC OUTCOMES:

1. Display professional skills and competencies in fields of Home Science matching industrial requirements for enhancing employability.
2. Address the issues and challenges prevailing in the society by the application of principles, concepts conceived by adopting and applying the best practices related to health and wellbeing.
3. Develop core competency skills to design and devise strategies to promote social, cultural, economic, ecological and gender equity. Develop effective communication and foster support extending to the community for sustainable livelihood.
4. Acquire proficiency in the perspectives of Home Science and engage in professions upholding moral principles, values and ethics.
5. Appraise and distinguish situations that demand immediate care and guidance in identification of developmental delays in children and exhibit professional competency in service and rehabilitation.
6. Transfer knowledge on ecofriendly technologies and means of diligent management of household resources to the community.
7. Acquire critical thinking, decision making attributes and aesthetic skills to enhance professional competency by updating and applying emerging trends and technologies.
8. Foster entrepreneurial skills enable pursuit of higher education, research and career in all the spheres of Home Science causing meaningful societal impact.

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First Year	CORE COURSE I FOOD SCIENCE	Semester: I
Code:	(Theory)	Credit: 5

COURSE 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.

UNIT - I INTRODUCTION TO FOOD SCIENCE AND COOKING METHODS:

Definitions - Food Science, Food, Nutrients, Nutritional Status, Mal-nutrition- Under – nutrition, over nutrition, Balanced diet, Hunger- Hollow Hunger, Hidden Hunger, Health, Meal, Menu. Food Groups - Basic five, My Plate, Nutritional classification of foods – Energy yielding, Body building and Protective foods. Cooking - Objectives, cooking methods- Moist and Dry heat methods of cooking, merits and demerits. Microwave cooking and solar cooking.

UNIT – II CEREALS AND PULSES:

Cereals and Cereal products - Structure and Nutritive value of rice and wheat, Nutritional importance of millets– maize, jowar, ragi, bajra; Milling of rice and wheat; Parboiling of rice, Products of wheat and rice, Enrichment and fortification of cereals and flours, Batters and doughs; Malting of cereals. Pulses - Nutritive value, factors affecting cooking quality of pulses, germination – process, advantages. Nuts - Composition and nutritive value-toxins in nuts and oilseeds

UNIT – III VEGETABLES, FRUITS AND MILK:

Vegetables - Classification, Nutritive value; Pigments- fat soluble, water soluble; selection of vegetables, cooking of vegetables- changes during cooking, nutrient loss, effect of cooking on the pigments. Fruits - Classification, Nutritive value; Changes during ripening of fruits, enzymatic browning and prevention, storage. Milk and Milk Products - Composition and Nutritive value, Different types of milk, effect of heat, acid and enzymes on milk.

UNIT – IV EGG AND FLESH FOODS:

Egg - Structure, Composition and Nutritive value. Factors affecting coagulation and foam formation, testing freshness in egg- candling. Meat- structure, composition, a list of different types of meat, cuts of meat, post mortem changes in meat, and tenderness of meat. Poultry- composition and classification. Fish- structure, composition, nutritive value, selection of fish.

UNIT - V FATS, SUGARS AND SPICES:

Fats and oils- composition, processing and refining of fats, refined oils, plasticity, hydrogenation, winterization. Smoking point, factors that lower smoking point, absorption of fat during cooking. Sugar- nutritive value, sugar related products, stages of sugar cookery, crystallization, factors affecting crystallization. Spices and condiments- types and uses in Indian cookery, medicinal value.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Browse material related to effect of cooking on the nutritive value of different foods. Food Sample Booklet (Millets, pulses, spices). Develop games on food and nutrients

REFERENCES:

1. Srilakshmi, B., (2010), Food Science, 6th edition New Age International (P) Limited, New Delhi.
2. Sunetra, R., (2007), Food Science and Nutrition, Oxford University Press, India.
3. Chandrasekhar, U.,(2002),Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi.
4. Potter, N., and Hotchkiss, J.H., (1995), Food Science, 5th edition, Chapman & Hall, New York.
5. Shakuntala, M. and Shadaksharaswamy. M., (2000), 2nd Edition, Foods, Facts and Principles, New Age International Pvt. Ltd., Publishers, New Delhi.
6. Brow, A., (2000), Understanding Food, Thomson Learning Publications,
7. Parker, R. (2000), Introduction to food Science, Delmer, Thomson Learning Co., Delma.
8. Mehas, K.Y. and Rodgers, S.L. Food Science and You, Mc Millan Mc Graw Company, New York, 2000.
9. https://www.pdfdrive.com/food-science-books.html
10. https://archive.org/details/textbookoffoodsc0000khad
11. https://himitepa.lk.ipb.ac.id/e-book/
12. www.fao.org
13. www.wfp.org

COURSE OUTCOMES:

- Identify the foods and classify them based on the basic V food group system
- Define the foods and describe its structure
- Demonstrate their ability in selecting the good food and reject those with low quality
- Analyse the different nutrients present in a food
- Compare the nutrients present in the different types of food and suggest the nutrient rich foods.

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First Year	CORE PRACTICAL I FOOD SCIENCE	Semester I
Code:	(Practical)	Credit: 4

GENERAL:

- Different types of cereals, pulses, vegetables, fruits and nuts and oil seeds – Observation
- Guidelines to be followed in laboratory.
- Method of Measuring Ingredients.
- Demonstration of Cooking Methods.
- Estimate the percentage of edible portion of foods.

PRACTICALS:

1. Cereals – Preparation of rice by steaming, absorption method, Straining and Pressure cooking. Preparation of Batters and dough. Preparation of idli, millet upma, chapathi, poori, fried rice, briyani, bisibelabath string hoppers, puttu, and Millet based variety rice.
2. Pulses – Factors affecting the cooking quality of pulses. Preparation of sambar, sundal, bholi, mysore-pak, vada, channa masala, thuvaiyal, green gram payasam, sprouted salad and koottu.
3. Vegetables – Selecting, cleaning, coring, pitting and chopping of fruits and vegetables. Avial, porriyal, pugath, stew, kuruma, podimas, pachadi, stuffed chapathi, cauliflower manchurian, vegetable kofta, stuffed capsicum, baked vegetables.
4. Fruits – Fritters, halwa, salad, stuffed items, payasam, panchamirtham
5. Milk – Cottage Cheese, paneer, phirnee, payasam, ice cream, kova, buttermilk curry, basanthi and jamun, sweet lassi, shrikand.
6. Egg – Boiled, scrambled, poached, curry, masala, omelette.
7. Fats and oils - Preparation- shallow fry- vegetable cutlet and deep fry; banana chips, vadai, diamond cuts.
8. Stages of sugar cookery.
9. Score card preparation and sensory evaluation.

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First Year | **FIRST ALLIED COURSE I** | **Semester : I**

HUMAN PHYSIOLOGY

Code: | **(Theory)** | **Credit: 4**

COURSE OBJECTIVES: To enable the students to

- Understand the structure and functions of various organs of the body
- Obtain a better understanding of the principles of nutrition through the study of physiology
- To gain knowledge on the importance of hormonal and nervous regulation of the body.

UNIT – I TISSUE AND BLOOD:

Cell and tissues - Structure of Cell and functions of different organelles. Classification, structure and functions of tissues. Blood - Constituents of blood- RBC, WBC and Platelets and its functions. Erythropoiesis, Blood clotting, Different Blood groups. Haemoglobin – Structure and functions; erthropoiesis, Blood coagulation, Reticulo- Endothelial System – Definition and functions, Lymphatic System.

UNIT - II CARDIO VASCULAR AND RESPIRATORY SYSTEM:

Heart and Circulation - Structure of heart and blood vessels; Properties of cardiac muscle, cardiac cycle, origin and conduction of heart beat; measurement of arterial blood pressure. Respiratory System - Structure of Respiratory organs; Sub – divisions of lung air; Mechanism of respiration.

UNIT - III DIGESTIVE AND EXCRETORY SYSTEM:

Digestive System - General Anatomy; Digestion in the mouth, stomach and intestines. Movements of the intestine;Role of Liver and Pancreas – Structure and Functions. Excretory system - Physiology of the Urinary System- Structure of kidney and nephron; Formation of urine, micturition. Skin – Structure and function of skin.

UNIT - IV ENDOCRINE AND REPRODUCTIVE SYSTEM:

Endocrine System - Structure and functions of thyroid, pituitary, parathyroid, adrenals, islets of langerhans of pancreas. Reproductive System - Anatomy of the male and female reproductive organs; menstrual cycle, Development of Embryo; Pregnancy and parturition.

UNIT - V NERVOUS SYSTEM AND SENSE ORGANS:

Nervous System - General classification of nervous system , Structure of nerve cell and Spinal cord; Basic Knowledge of different parts of the brain – anatomy and functions of cerebrum, cerebellum and medulla oblongata. Sense Organs - Structure and function of eye, ear, physiology of taste and smell.

UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Write an assignment on Artificial respiration and ECG. Develop E content on Structure and physiological functions of any one organ.

REFERENCES:

1. Sembulingam, K. (2000). Essentials of Medical Physiology. Jaypee Brothers Medical Publishers (P) Ltd., New Delhi
2. Saradhasubrahmanyam and MadhavanKutty, (2020).Text book of Human Physiology. S.Chand Publication.
3. Chatterjee C.C (2004). Human Physiology. Volume I. Medical Allied Agency. Kolkata
4. Chatterjee C.C (2004). Human Physiology/ Volume II.Medical Allied Agency. Kolkata
5. Gillian Pocock, Christopher D. Richards, David A. Richards (2018). Human Physiology. oxford University Press.(5th ed)
6. Lauralee Sherwood (2015). Human Physiology: Cells to systems. Cengage Learning
7. H S Ravi Kumar Patil, H. K. Makari, H. Gurumurthy, S. V. Sowmya, (2009). A text book of Human Physiology. I.K. International Publishing House Pvt. Limited.
8. Guyton and Hall (2000). Textbook of Medical Physiology. Saunders. States of America.
9. Wilson, Ross (2014). Anatomy and Physiology in Health and Illness. Reed Elsevier India Private Limited. NewDelhi.
10. Murugesh.N(2011). Anatomy and Physiology. Sathya Publishers. Madurai
11. Chaudhri, K. (1993). Concise Medical Physiology, New Central Book Agency Ltd., Calcutta.
12. https://egyankosh.ac.in/handle/123456789/81726
13. https://tripurauniv.ac.in/
14. https://nwtc.libguides.com/
15. https://palmbeachstate.libguides.com/

COURSE OUTCOMES:

- Outline composition and functions of blood
- Interpret anatomy and physiology of circulatory and respiratory system
- Discuss regulation of digestive and excretory system
- Relate structure and functions of endocrine and reproduction system
- Explain the structure, functions of nervous system and sense organs

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First Year **FIRST ALLIED PRACTICAL I** **Semester : I & II**

HUMAN PHYSIOLOGY AND FOOD CHEMISTRY

Code: **(Practical)** **Credit: 2**

COURSE OBJECTIVES: To enable the students to

- To acquire knowledge on cellular arrangements and blood components.
- To learn methods to be adopted for the measurement of various blood parameters

PRACTICALS:

1. Histology of Tissues – Columnar, cubical, ciliated, squamous, stratified squamous.
2. Microscopic structure of organs – lungs, artery, vein, stomach, ovary, testis, uterus, pancreas.
3. Histology of muscles – cardiac, striated, non –striated
4. Estimation of Haemoglobin, Bleeding time, Clotting time
5. Measurement of Blood pressure using Sphygmomanometer.
6. Determination of Pulse rate using Pulsoximeter.
7. Blood smear preparation and staining procedure
8. Determination of Bloodgroup and Rh factor.
9. Enumeration of Red blood cells.
10. Enumeration of White blood cells.
11. Demonstration of differential count of leucocyte.

REFERENCES:

1. G.K.Pal and Parvati Pal (2016). Textbook of practical physiology. Universities press. (India) private limited.
2. Sembulingam, K. (2000). Essentials of Medical Physiology. Jaypee Brothers Medical Publishers (P) Ltd. New Delhi.
3. Chatterjee C.C (2004). Human Physiology Volume I. Medical Allied Agency. Kolkata
4. Saradha Subrahmanyam and K. Madhavan kutty (2020). Text book of Human Physiology. S.Chand Publication.
5. Gillian Pocock, Christopher D. Richards, David A. Richards (2018). Human Physiology. (5th ed) Oxford University Press Lauralee Sherwood (2015). Human Physiology: Cells to systems. Cengage Learning.

COURSE OUTCOMES:

- Identify cells present in the body
- Describe cellular arrangement in tissues and organs
- Articulate the methods to be adapted for the measurement of various blood parameters
- Explain cellular arrangement in tissues and organs
- Appraise number of cells present in blood.

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First Year	CORE COURSE II PRINCIPLES OF NUTRITION	Semester : II
Code:	(Theory)	Credit: 5

COURSE OBJECTIVES: To enable the students to

- Understand role of macro and micro nutrient relevant to human health.
- Introduce composition of various food groups.
- Gain knowledge on physiological role, requirement and deficiency conditions of macro and micro nutrient.
- Learn to calculate energy expenditure of humans.
- Know the importance of water to maintain homeostasis of human body.

UNIT - I INTRODUCTION TO NUTRITION:

Definition of nutrition, health, nutritional status and malnutrition. Inter-relationship between health and nutrition.
RDA– Definition, factors affecting RDA, general principles of deriving RDA, Determination of RDA of different nutrients.

UNIT - II CARBOHYDRATES AND ENERGY:

Carbohydrates – Definition, nutritional classification, functions, RDA, sources and deficiency and excess effects. Dietary Fibre – definition, Classification, components of dietary fibre, physiological and metabolic effect, role of fibre in prevention of diseases, RDA and sources.

Energy –Forms of energy, units of measurement, determination of energy value of food, total energy requirement, energy requirements during work, thermic effect of food. Basal Metabolic Rate – Factors affecting Basal metabolic rate,

UNIT - III PROTEINS AND LIPIDS:

Proteins – Definition, nutritional classification of proteins and amino acids, functions of proteins and amino acids, RDA, sources, and deficiency and excess. Evaluation of protein quality.(PER, BV, NEU, CS)

Lipids – Definition, nutritional classification of lipids, functions, RDA, sources. Essential fatty acids – Definition, functions, sources, deficiency and excess effects, omega fatty acids- functions and food sources.

UNIT - IV MICRONUTRIENTS:

Vitamins - Fat Soluble Vitamins (A, D, E &K) - Functions, RDA, sources, deficiency and excess. Water Soluble Vitamins (B&C) - Functions, RDA, sources, deficiency and excess.

Minerals - Macro Minerals (Calcium, Phosphorus, Potassium, Sodium) - Functions, RDA, sources, deficiency and excess effects.
Micro Minerals (Iron, Iodine, Fluorine) - Functions, RDA, sources, deficiency and excess effects.

UNIT – V WATER AND NUTRIENT INTERRELATIONSHIP:

Definition, distribution of water, function, requirements, sources, water balance, maintenance of water balance, distribution of electrolytes, maintenance of electrolyte balance. Macronutrients and vitamin interrelationship

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Determine energy requirements of any five individuals by factorial approach method. Record clinical symptoms of any one vitamin deficiency among the community.

REFERENCES:

1. Raheena Begum M (2009). Textbook of Foods. Nutrition and Dietetics Sterling Publishers, New Delhi
2. Mahtab S. Bamji (2017). Textbook of Human Nutrition. Oxford & IBH Publishing Co Pvt Ltd
3. Bogert, J.G.V. Briggs, D.H. Calloway (1985). Nutrition and physical fitness. (11th ed) W.B. Saunders Co., Philadelphia. London. Toranto
4. Wardlaw, G.M. Insel, P.H. (1990) Perspectives in Nutrition. Times Mirror / Mosby College Publishing Co. St. Louis. Toronto. Boston.
5. William, S.R. (1985). Nutrition and Diet Therapy. (5th ed) Mosbey Co. St. Louis.
6. M. Swaminathan (1993). Principles of Nutrition and Dietetics. Bappco 88. Mysore Road. Bangalore.
7. Maurice E. Shils, James A. Olson, Moshe Shike (1994). Modern Nutrition in health and disease.Vol. I & II (8th ed) febiger Philadelphia. A waverly Company.
8. Martin Eastwood (2013). Principles of Human Nutrition Wiley Publishing
9. Raheena Begum M (2009). Textbook of Foods. Nutrition and Dietetics Sterling Publishers, New Delhi
10. Mahtab S. Bamji (2017). Textbook of Human Nutrition. Oxford & IBH Publishing Co Pvt Ltd.
11. Mahan Kathleen L, Sylvia Escott Stump (2001). Krause's, Food nutrition and Therapy, W.B. Saunders Co.
12. https://www.anme.com.mx/libros/Principles%20of%20Human%20Nutrition.pdf
13. https://egyankosh.ac.in/bitstream/123456789/333
14. https://www.anme.com.mx/libros/Principles%20of%20Human%20Nutrition.pdf
15. https://open.umn.edu/opentextbooks/textbooks/622

COURSE OUTCOMES:

- Illustrate sources, requirements, role and deficiency of macro and micro nutrient
- Explain beneficial effects of macro and micro nutrient on human health.
- Analyze quality of nutrients present in food.
- Describe basal metabolism rate and energy expenditure of humans.
- Relate water and electrolyte balance in human body and the interrelationship of nutrients.

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First Year	CORE PRACTICAL II PRINCIPLES OF NUTRITION	Semester : I & II
Code:	(Practical)	Credit: 4

COURSE OBJECTIVES: To enable the students to

PRINCIPLES OF NUTRITION PRACTICALS:

1. Plan, prepare and calculate the nutrients of macro nutrient rich dishes of one serving
a. Energy – High Calorie and Low Calorie
b. Carbohydrate – High Carbohydrate and Low Carbohydrate
c. Protein – High Protein and Low Protein
d. Fat – High Fat and Low Fat
e. Dietary Fibre – High Fibre and Low Fibre.

2. Plan, prepare and calculate the nutrients of micro nutrient rich dishes of one serving - Vitamins:
   Vitamin A, Vitamin C, Thiamine, Riboflavin, Niacin, Pyridoxine, Folic Acid and Cyanocobalamine.

3. Plan, prepare and calculate the nutrients of micro nutrient rich dishes of one serving - Minerals:
   Calcium, Iron, Zinc, Phosphours, Sodium and Potassium.

4. Demonstration on estimation of nitrogen in food using Kjeldahl method.

5. Demonstration on estimation of total fat in food using Soxhlet method

REFERENCES:

Gopalan.C, Rama Sastri.V.B and Balasuramanian.S.C (2016). Nutritive Value of Indian

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FIRST YEAR **FIRST ALLIED COURSE –I** **Semester : I & II**

HUMAN PHYSIOLOGY AND FOOD CHEMISTRY

Code: **(Practical)** **Credit:4**

OBJECTIVES: To enable the students to

PRACTICAL:

1. Chemistry of Starch and Sugars
    a) Gelatinization of Starch, Microscopic Examination of uncooked and gelatinized Starch.
    b) Retrogradation and Syneresis
    c) Stages of Sugar Cookery, Preparation of Fondant, Fudge, and Toffee, Scum formation in milk.
2. Chemistry of Proteins
    a) Gluten Formation
    b) Effect of Soaking, germination and fermentation of Pulses
    c) Coagulation of egg white and egg yolk
    d) Boiled Egg, Poached Egg, Omlettes, Custardsand Mayonnaise
    e) Coagulation and precipitation of milk proteins.
    f) Changes observed in Cooking Meat, Fish and Poultry, Testing the Tenderness of meat.
3. Chemistry of Fats and Oils
    a) Smoking Temperature of Different Fats
    b) Factors Affecting Absorption of Fats

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FIRST YEAR **FIRST ALLIED COURSE –II** **Semester : IV**

FOOD CHEMISTRY

Code: **(Theory)** **Credit:4**

COURSE OBJECTIVES:To enable the students to

- Gain insight into the chemistry of foods
- Understand the scientific principles involved in food preparation
- Understand the physicochemical changes and various properties exhibited by foods

UNIT – I PHYSICOCHEMICAL PROPERTIES OF FOOD:

Definition and history of food chemistry. Role of food chemist in food industry; Physicochemical properties of foods - physical properties of water and ice; types of water, Water Activity in Foods and stability, packaging, sorption phenomenon, temperature dependence, Determination of Moisture Content in Foods; True Solutions, Dispersions, Sols, Gels, Foams, Colloids and Emulsions.

UNIT – II CHEMISTRY OF STARCH AND SUGARS:

Structure of important polysaccharides (starch, glycogen, cellulose, pectin, hemicellulose, gums) Modified celluloses and starches- Components of Starch, Swelling of Starch Granules, Gel Formation, Retrogradation, Syneresis; Effect of Sugar, Acid, Alkali, Fat and Surface-Active Agents on Starch; Stages of Sugar Cookery, Crystallization and factors affecting it. Chemistry of Milk Sugar, Non-Enzymatic Browning.

UNIT – III CHEMISTRY OF PROTEINS:

Nature of Food Proteins (Plant and Animal), Structure and Classification of Protein, Properties of Protein-Electrophorosis, Sedimentation, Amphoterism and Denaturation, Solubility, Viscosity, Binding, Gelation, Texturization, Emulsification And Foaming; Functional Properties of Protein Rich Foods.

UNIT – IV CHEMISTRY OF FATS AND OILS:

Classification and Characteristics of lipids. Physical properties- melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point, Chemical properties- Reichertmeissel value, Polenske value, iodine value, peroxide value, saponification value; Effect of frying on fats, Changes in fats and oils- rancidity, lipolysis, flavor reversion, Technology of edible fats and oils- Refining, Winterization, Plasticity, Hydrogenation and Interesterification, Shortening Power of Fats, Changes in Fats and Oils during Heating, Factors Affecting Fat Absorption in Foods.

UNIT – V ENZYMES, PIGMENTS AND FLAVOURS ENZYMES:

Enzymes:Introduction, classification General characteristics, Enzymes in food processing, Industrial Uses of Enzymes, Immobilized enzymes. Pigments: Types of Plant Pigments- Water Soluble and Fat Soluble, Effect of Acid, Alkaline and Heat on Pigments. Flavors: Definition and basic tastes, Chemical structure and taste, Description of food flavors, Flavor enhancers.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Prepare e-content for stages of sugar cookery. Visit to Oil mills and prepare a report for processing of fat.

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1. Chandrasekhar, U. 2002. Food Science and applications in Indian Cookery, Phoenix Publishing House, New Delhi.
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4. Shakuntala Manay, Shadaksharaswamy, M. 2000. Foods, Facts and Principles, 2nd Edition New Age International Pvt Ltd Publishers.
5. Srilakshmi,B. 2016. Food Science, New Age International Publishers, New Delhi.
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7. Yadav, Seema, 2006. Food Chemistry, Anmol Publications (P) Ltd, New Delhi.
8. Chopra H.K, Panesar, P.S, 2010. Food Chemistry, Narosa Publishing House, New Delhi.
9. Meyer, L.H, 2004. Food Chemistry, 4th edition, CBS Publishers and Distributors.
10. Paul, P.C. and Palmer, H.H. 2000. Food Theory and Applications, Revised Edition, John Wiley and Sons, New York.
11. Satarkar, Archana, 2008. Food Science and Nutrition ABD Publishers, Jaipur.
12. Shubhangini, A.Joshi, 2010. Nutrition and Dietetics with Indian case studies, Mc Graw Hill Education(India), Pvt., Ltd, New Delhi.
13. https://libraryguides.mcgill.ca/
14. https://ipa-pasca.unpak.ac.id/
15. http://ecoursesonline.iasri.res.in/
16. https://link.springer.com/

COURSE OUTCOMES:

- Infer the chemistry of underlying properties and reactions of water and basics of food chemistry
- Relate the chemistry of starch and sugars and know the major chemical reactions that limit shelf life of foods using sugars.
- Apprehend the chemistry of protein, their functional properties in food.
- Select the appropriate fats to be used in cooking and their storage and functional uses.
- Appraise the role of enzymes and flavours in Indian cookery

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Second Year	CORE COURSE III NUTRITION THROUGH LIFE CYCLE	Semester : III
Code:	(Theory)	Credit: 5

OBJECTIVES: To enable the students to

- Understand the importance of nutrition and health.
- Comprehend the basic aspects of meal planning.
- Obtain knowledge on the nutritional needs pertaining to different stages of life.
- Plan diet for various age groups.

UNIT – I MEAL PLANNING AND NUTRITION IN ADULTHOOD:

Acceptable Dietary Intake, Use of ICMR RDA in planning balanced diet, Basic principles of meal planning, RDA, food allowance for different age groups, factors influencing nutritional requirements for all age groups. Nutrition in adulthood – reference man and reference women, nutritional and food requirements of an adult man and women, body composition, nutrition and health issues, meal planning to suit different income levels.

UNIT – II NUTRITION IN PREGNANCY AND LACTATION:

Nutrition during pregnancy – stages of pregnancy, physiological changes, weight gain in pregnancy, complications, factors influencing the outcome of pregnancy, nutritional requirements and meal planning for pregnant women. Nutrition for lactating women – Physiology and psychology of lactation, hormonal control, colostrum – composition, composition of breast milk, factors affecting the volume and composition of breast milk, nutritional requirements of a nursing mother, meal planning, factors responsible for lactation failure.

UNIT – III NUTRITION IN INFANCY:

Nutrition in infancy – birth weight of infants, rate of growth, milestones in development (only stages), immunization schedule, nutritional requirements, process of breast feeding, superiority of breast milk, advantages of breast feeding, comparison of human milk with cow's milk, artificial feeding, weaning and supplementary foods, weaning problems and complications. Characteristics of low-birth weight infant, small for date babies, pre-term babies-Feeding of preterm infants.

UNIT – IV NUTRITION IN THE PRESCHOOLERS AND SCHOOL AGE CHILDREN:

Nutrition in preschool age – Growth and development, nutritional requirements, factors affecting nutritional status, food requirement, low cost supplementary foods, nutrition related problems in childhood, meal planning for the preschool child. Nutrition in the school age children – Growth pattern in school children, nutritional and food requirement, packed lunch – factors to be considered, sample menu, nutritional problems, meal plan for the school children.

UNIT – V NUTRITION IN ADOLESCENCE AND ELDERLY:

Nutrition in adolescence - growth and development, body composition, puberty, secondary sexual characteristics, psychological changes, nutritional requirements, nutritional problems, malnutrition due to early marriage, food habits and meal plan. Eating disorders-Binge eating, anorexia nervosa, bulimia nervosa. Nutrition in elderly – definition of

geriatrics, changes in body composition, physiological changes, psychological and socio- economic factors in relation to food intake, nutritional requirement, food modification in old age. Nutrition related problems.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Dissemination of nutrition knowledge for chosen target groups during. National Nutrition Month. Sensitising the nursing mothers on the importance of breast feeding during World Breast Feeding Day.

REFERENCES:

1. Mahtab, S., Bamji, Krishnasamy, K., Brahmam, G.N.V., (2012) Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
2. Srilakshmi, B., (2013), Dietetics, New Age International (P) Ltd., New Delhi.
3. Swaminathan, M., (2012), Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.
4. Shubhangini, A., Joshi (2002): Nutrition and Dietetics, 2nd edition, Tata McGraw-
5. Hill Publishing Company Limited, New Delhi.
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14. https://ocw.ui.ac.id/pluginfile.php/12209/mod_resource/content/1/Nutrition%20Through%20the%20Life%20Cycle%20by%20Judith%20E.%20Brown%20%28z-lib.org%29.pdf
15. http://www.freebookcentre.net/medical_text_books_journals/nutrition_ebooks_online_texts_download.html
16. https://vdoc.pub/documents/nutrition-through-the-life-cycle-3rd-edition-6krnmbdqjeq0

COURSE OUTCOMES:

- Relate the different stages of growth and nutrient requirements in the human life cycle.
- Compare the Recommended Dietary Allowance for different age groups based on gender and activity.

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Second Year	CORE PRACTICAL III NUTRITION THROUGH LIFE CYCLE	Semester : III
Code:	(Practical)	Credit: 4

PRACTICALS:

- Illustrate the food and nutritional requirements for specific groups of people based on their age and food habits.
- Explain the nutrition related problems common in different stages of life cycle and its impact on health.
- Recommend specific nutrients and foods for various age groups quantitatively and qualitatively.

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Planning, nutritive value calculation and preparing one servingmeal for:

1. Adult man belonging to low socio-economic group.
2. Adult man belonging to middle socio-economic group.
3. Adult man belonging to low socio-economic group.
4. Adult woman.
5. Pregnant woman.
6. Lactating woman.
1. Liquid supplementary food.
2. Semisolid supplementary food.
3. Solid supplementary food.
4. Preschool child.
5. School going child.
6. Adolescent boy.
7. Adolescent girl.
8. Elderly.
9. Demonstration of Diet Software

REFERENCE:

1. Seth, V. and Singh, K., (2013), Diet Planning through the Life.

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Second Year: II	**SECOND ALLIED COURSE-I FOOD MICROBIOLOGY**	**Semester : III**
Code:	**(Theory)**	**Credit: 4**

CO

URSE OBJECTIVES: To enable the students to

- Understand the basics of food microbiology and understand the important genera of microorganisms associated with food and their characteristics.
- Identify and recognize the methods of isolation and cultivation of microbes
- Comprehend and differentiate the sources of Microorganisms in foods.
- understand the role of microbes in disease progression of food borne illness
- Learn, Solve and apply the simple preservation methods

UNIT – I INTRODUCTION TO FOOD MICROBIOLOGY:

Introduction of microbiology - History and Development of Food Microbiology. Definition and Scope of food microbiology; General characteristics of bacteria, fungi, virus, protozoa, and algae.

UNIT – II CULTIVATION OF MICRO-ORGANISMS:

Methods of isolation and cultivation, Serial dilution method, Pure culture technique; Microbial Growth in Food: Bacterial growth curve and microbial growth in food. Factors affecting the growth of microorganisms in food, effect of environmental factors in growth of microorganism - pH, water activity, oxygen availability, temperature and others.

UNIT – III MICROBIAL FOOD SPOILAGE:

Sources of Microorganisms in foods. Some important food spoilage microorganisms. Spoilage of specific food groups –cereal, milk, egg, fish, meat and poultry; fruits and vegetables and canned & baked products.

UNIT – IV FOOD BORNE DISEASES:

Microbial intoxication and infections: Sources of contamination of food, Types of food borne infections, food borne intoxications, symptoms and method of control. Toxins in foods – bacterial and mycotoxin- Health effects

UNIT – V WATER BORNE DISEASES:

Sources of contamination of water, Microbiology of fresh water and wastewater, Types – water borne infections – cholera amoebiasis, giardiasis, Pathophysiology symptoms Prevention treatment and method of control.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Visiting a food microbiology analytical lab & Observation in college canteen to record the route of contamination. Preparation of any common and recent examples of Food borne out breaks- News paper clips.

REFERENCES:

1. MO Moss & MR Adams Food Microbiology (2008) New Age Publishers
2. Ramesh Singh Food Microbiology (2021) MJP Publishers
3. FOSTER W.M Food Microbiology (2020) CBS Publisher
4. Frazier William C and Westhoff, Dennis C. Food Microbiology, McGraw Hill Education; Fifth edition 2017 ISBN 9781259062513
5. Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
6. Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997.
7. Banwartt: Food Microbiology
8. Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993.
9. https://www.frontiersin.org/journals/microbiology/sections/food-microbiology
10. https://microbiologysociety.org/publication/past-issues/food-microbiology.html
11. https://www.longdom.org/foodmicrobiology-safety-hygiene.html

COURSE OUTCOME:

- Understand different terminology related to microorganism
- Relate the different factors responsible for the microbial growth
- Analyze and describe the characteristics of important microbial pathogens and spoilage in food
- Acquire, discover and understand the food borne diseases and importance of hygienic and sanitary practices
- Apply simple preservation methods to increase the shelf life of foods

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Second Year	**SECOND ALLIED PRACTICAL FOOD MICROBIOLOGY AND NUTRITIONAL BIOCHEMISTRY (Practical)**	**Semester : III & IV**
Code:		**Credit: 2**

COURSE OBJECTIVES: To enable the students to

- To acquire knowledge on microorganisms responsible food spoilage
- To learn methods to be adopted the sterilization techniques and culture preparation

FOOD MICROBIOLOGY – PRACTICAL:

1. Introduction to the Basic Microbiology Laboratory Practices and Equipment
2. Microbial slides - Gram positive cocci: staphylococcus, streptococcus, Gram Positive cocci: Neisseria; Gram Positive Bacilli: Corynebacterium, Bacillus, Clostridium Gram Negative Bacilli: Enterobacteriaceae, Pseudomonas Mycobacterium: Mycobacterium tuberculosis, Mycobacterium leprae; Spirochetes; Mycoplasma
3. Cleaning, sterilization techniques, sterilization - equipment glassware
4. Preparation and sterilization of nutrient broth
5. Preparation of slant, stab and plates using nutrient agar
6. Preparation of bacterial smear & Gram staining.
7. Culture techniques -Pour, spread & streak
8. Hanging drop method for testing motility of bacteria.
9. Methylene Blue Reductase test on Milk
10. Antibiotic assay and Disc sensitivity on microbes - Demonstration
11. Effect of temperature on the growth of microbes - Demonstration

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Second Year **NON MAJOR ELECTIVE I** **Semester III**

FOOD PRODUCT DEVELOPMENT

Code: **(Theory)** **Credit: 2**

Course Objectives :

To enable the students to :
Understand the steps involved in new food product development.
Learn about consumer preferences and market trends.

UNIT I Introduction to New Food Product development

Food products, definition, Classification, Characterization Reasons for new food product Development Factors shaping new product development-Social concerns, healthconcerns impact of technology and marketplace influence. Utilizing traditional foods, unconventional sources, functional, nutraceuticals foods for new product development. Market Survey to identify the new product.

UNIT II Product Development:

a) New Product Development Team
b) Sources of New Product ideas
c) Designing new product
d) Stages of product development
e) Causes of product failure/ success in product development

UNIT III Product Evaluation and Quality Control

Quality attributes – physical, chemical, nutritional, microbial, and sensory indicators Principles and types of assessment of quality. Subjective and objective methods of evaluation of product quality. Role of sensory evaluation in consumer product acceptance; requirements for sensory analysis - Sensory panel Evaluation of New Product Nutritional evaluation (estimation of relevant parameters) Evaluation of shelf-life of the product (testing for appropriate quality parameters- physical, chemical, microbiological and nutrient content, acceptability studies)
Food safety standards and regulations: Domestic regulations FSSAI, AGMARK, BIS Quality management systems in India; (ISO9001, ISO22000); Global Food safety Initiative; International food standards Various national and international organizations dealing with inspection, traceability and authentication, certification, and quality assurance.

UNIT IV Packaging and labeling

Packaging Material-types; factors affecting type of packaging material used; Aseptic packaging, modified atmosphere packaging, Controlled Atmosphere Packaging and active packaging. Packaging and Labelling of the product – Packaging design, graphics and labelling – FSSAI regulations for food labelling.

UNIT V Marketing the product

Product life cycle Costing the product and determining the sales price Advertising and test marketing the product

COURSE OUTCOMES

Define the basic concepts in food product development, packaging, costingadvertising and marketing.
Explain the need, characteristics and factors influencing the new product;testmarketing, packaging and quality attributes.
Illustrate the quality attributes, food safety, packaging and labellingregulations,and marketing tools for a food product.
Analyse the significance of packaging, labelling, advertising, costing and quality concepts for the new food product
Develop a new food product and evaluate its quality and acceptability.

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Second Year	CORE COURSE IV DIETETICS	Semester: IV
Code	(Theory)	Credit: 5

COURSE OBJECTIVES: To enable the students to

- Provide comprehensive knowledge on principles and planning of therapeutic diets.
- Acquire knowledge on nutritional needs of normal and sick persons.
- Assess the nutritional/ disease condition and effectively manage the nutritional needs of target people.
- Develop capacity and aptitude for taking up dietetics as a profession.

UNIT – I CONCEPT OF DIET THERAPY:

Purpose and principle of therapeutic diets, modification of normal diet, classification of therapeutic diets; Special feeding techniques – enteral and parenteral feeding. ; Role of dieticians in nutritional care. Diet counselling, Indian Dietetic Association (IDA)

UNIT – II DIETARY MANAGEMENT OF FEVER AND DEFICIENCY DISEASES:

Aetiology, symptoms and principles of dietary management:-Protein energy Malnutrition; Vitamin A deficiency; Anaemia & Iodine deficiency; Febrile conditions – Acute & Chronic-Typhoid, influenza, malaria, tuberculosis.

UNIT – III DIETARY MANAGEMENT OF GI TRACT & LIVER:

Aetiology, symptoms and principles of dietary management: - Diarrhoea, dysentery and constipation; Peptic ulcer, Irritable bowel syndrome; Disease of liver & Gall bladder-Hepatitis, cirrhosis, cholelithiasis

UNIT – IV LIFE STYLE DISORDERS/DISEASES:

Aetiology, symptoms, complications and principles of dietary management: -Obesity, Diabetes mellitus; Cardio vascular diseases – hypertension, atherosclerosis; Cancer.

UNIT – V DIETARY MANAGEMENT OF RENAL DISEASES & SPECIAL CONDITIONS:

Aetiology, symptoms and principles of dietary management. Nephritis, nephrosis, urolithiasis, renal failure – acute and chronic and Dialysis – types; Nutrition for children with special needs - Autism & Cerebral palsy

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Visit to the Dietary Department of Hospital. Preparation of diet charts & diet prescription/ready reckoner with reference to a specific health ailment

REFERENCES:

1. Srilakshmi B, Dietetics (2017), New Age International Publishing Ltd.
2. Antia F. P. Clinical Dietetics and Nutrition,2002 4th edition, Oxford university press.
3. Indian Dietetic Association, (2018) Clinical Dietetics Manual Elite Publishing House Pvt. Ltd
4. Meenakshi Bajaj (2019) Diet Metrics: Hand Book of Food Exchanges, Notion Press Media Pvt Ltd,
5. Shubhangini A Joshi (2021) Nutrition and Dietetics, McGraw Hill
6. Sheila John, Jasmine Devaselvam (2016) Essentials of Nutrition and Dietetics for Nursing, Wolters Kluwer India Pvt. Ltd
7. Davidson and Passmore, Human Nutrition and Dietetics, Churchill Livingstone publication.
8. Sue Rodwell Williams, Basic Nutrition and Diet Theraphy, 2000 Mosby publication.
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11. Mohan K. L, Krause M.V (2002), Food , nutrition and Diet Therapy, W.B.Saunders Co, Philadelphia.
12. Robinson C.H., Lawler M.R, Cheweth W.L; and Gaswick A.E, Normal and Therapeutic Nutrition ,17 th edition, Mac Milan Publishers.
13. https://www.cdc.gov/nutrition/index.html
14. https://archive.nptel.ac.in/courses/126/104/126104004/
15. https://www.pdfdrive.com/nutrition-and-dietetics-text-books-online-e6071568.html
16. https://www.infobooks.org/free-pdf-books/medical/nutrition/

COURSE OUTCOMES:

- Understand and critically modify the normal diet to suit various therapeutic conditions and develop the knowledge, skills and attributes required to meet entry level competency required for a dietician
- Recognize and identify the deficiency disorders and plan a diet
- Apply the knowledge of nutrition and dietetics to manage therapeutic intervention.
- Evaluate, investigate and formulate diet for Life style disorders
- Analyse, apply, and plan a Diet of GI Tract & excretory diseases.

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Second Year	**CORE PRACTICAL-IV**	**Semester: IV**
	DIETETICS AND DIETARY INTERNSHIP	
Code:	**(Practical)**	**Credit: 4**

Practical :

Planning, Nutritive value Calculation and preparation of diets for one serving for the following deficiencies/ diseases/disorders/ conditions:

1. Routine hospital diets – full fluid, clear fluid, soft
2. PEM and Anaemia
3. Constipation, Diarrhoea
4. Peptic ulcer
5. Hepatitis and Cirrhosis
6. Fever – Typhoid
7. Obesity
8. Diabetes Mellitus
9. Hypertension& Atherosclerosis
10. Nephritis
11. Nephrosis
12. Autism

DIETARY INTERNSHIP

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Second Year **SECOND ALLIED PRACTICAL- I** **Semester : III & IV**

FOOD MICROBIOLOGY AND NUTRITIONAL BIOCHEMISTRY

Code: **(Practical)** **Credit:2**

Course : To enable the students to

PRACTICALS:

1. Qualitative analysis of Urine for Sugar , Protein, Bile salts & Bile pigments
2. Estimation of Urine Glucose (Benedict's Method)
3. Estimation of Urine Urea (DAM Method)
4. Estimation of Blood Glucose (Benedict's Method)
5. Estimation of Blood Urea (DAM Method)
6. Estimation of serum cholesterol (Zak's Method)

REFERENCES:

1. Practical Biochemistry(Laboratory manual) for pharmacy students,Ritu Mahajan,Vayu education of India, New Delhi, First Edition,2009.
2. Biochemistry & Clinical pathology (Theory & Practical),K.K.Pillai&J.S.Qadry,CBS Publishers& Distributors, New Delhi, First edition(Reprint)(2008) .
3. Varley's Practical Biochemistry, Alan H Gowenlock, CBS Publishers& Distributors, New Delhi, Sixth edition(2008) .

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Second Year	SECOND ALLIED COURSE II NUTRITIONAL BIOCHEMISTRY	Semester: IV
Code:	(Theory)	Credit: 4

COURSE OBJECTIVES: To enable the students to

1. Understand the mechanisms adopted by the human body for the regulation of metabolic pathways
2. Get an insight into interrelations between various metabolic pathways.
3. Become proficient for specialization in nutrition.

UNIT-I Carbohydrate metabolism

Carbohydrate – Classification**.** Metabolism of Carbohydrate - Glycolysis, Glycogenesis, glycogenolysis, Tricarboxylic acid Cycle (TCA cycle), Hexose Monophosphate Shunt, Gluconeogenesis. **Disorder of carbohydrate metabolism**-Diabetes Mellitus-Types and metabolic changes of Diabetes Mellitus. Role of liver in Carbohydrates Metabolism

UNIT-II Protein metabolism

Protein - Classification. Metabolism of Protein - General pathway of Protein metabolism. **Metabolism of amino acid** - Deamination, Transamination, Decarboxylation, Urea Cycle, Fate of deaminated amino acids. Disorder of Protein metabolism.

UNIT-III Lipid metabolism

Metabolism of Lipid-Beta Oxidation of Fatty acid, Synthesis of Triglycerides, Fatty acids and Cholesterol. Role of fat in Lipid metabolism. **Plasma Lipoproteins**: Functions and metabolism of Lipoprotein. **Disorder of Lipoproteins**- Hyperlipoproteinemias and Hypolipoproteinemias.

UNIT-IV Liver and Kidney function test

Formation of Bile acid-Formation and functions of Bile acids and bile salts - bile pigments. Jaundice. **Liver Function Test-** Test for bile pigment and bile salts in blood and urine-Van den Bergh reaction, Serum alkaline phosphatase estimation, Fouchet's test, Hay's test. Test for Urobilinogen-Schlesinger's test. Test for altered protein fraction production- Cephalin – cholesterol flocculation test and Thymol turbidity test. **Renal Function Tests**: Inulin clearance test, Urea Clearance test, Endogenous creatinine Clearance, Concentration test, Addis test, Mosenthal test, Urea concentration Text and Dye test.

UNIT-V Inborn error of carbohydrates, protein and Lipid metabolism

Inborn errors of Carbohydrates metabolism-Essential pentosuria,Fructosuria,Galactosemia. **Inborn errors of aminoacid metabolism**- Albinism, Phenylketonuria, Hurtnup Disease, Cystinuria, Homoystinuria,, histidinuria and Maple syrup disease. I**nborn errors of fat metabolism**-Wolman's disease, Gaucher's disease and Niemann- pick Disease.

TEXT BOOKS

1. Ambika Shanmugam, Fundamentals of Biochemistry for Medical Students, Seventh Edition, New Age Publishing Pvt.Ltd, New Delhi (1986).
2. A.C. Deb, Fundamentals of Bio chemistry, Fifth Edition , New Central Book Agency(P)td., (1992).
3. U. Sathyanarayana and U. Chakrapani, Textbook of Biochemistry, Third Edition, Books and Allied (P) Ltd, Kolkata (2010).
4. E.S. WestTodd, W.R. Mason and J.T. Van Bruggen, Text book of Biochemistry, Fourth Edition, Amerind Publishing Co Pvt Ltd., (1974).
5. T.M. Devlin, Text Book of Biochemistry (with Clinical corrections), Second Edition, John Wiley and sons (1986).
6. Ramakrishnan, K.G. Prassanan and R. Rajan, Text book of Medical Biochemistry, Second Edition, Orient Longman limited (1989).

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Second Year	NON MAJOR ELECTIVE II CONSUMER EDUCATION	Semester IV
Code	(THEORY)	Credit: 2

Course objectives

1. Familiar with the problems in buying and consumer legistelations
2. Aware of marketing conditions and means for the problem redressal
3. Create awareness on various consumer buying problems

Unit – I

Consumerism and consumer buying problem - 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.

Unit- II

Human wants, Demand and Supply - 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. **Types of income -** Real, money, psychic, relationship of GNP, national income, personal income, disposable income.

UNIT – III

Markets and marketing - Basic Concept, Classification and functionsof Markets, Types of Market. Channels of Distribution: Meaning, types and their advantages and disadvantages. **Consumer in the market -** Consumer buying habits, buying motives and buying problems. **Consumer Aids** a. Brand – Different types and its importance. Labels – Importance, Merits and demerits.Importance of Packaging and Advertising.

UNIT-IV

Quality Assessment of Products - Definition – Standards and standardization and its Importance. Quality Seal – BIS, ISI,AGMARK, ISO, HALL MARK, BEELABEL and FPO.

UNIT-V

Consumer decision making process - Types of consumer decisions, process of decision making, factors determining and influencing consumer behavior, guidelines for wise buying practices. **Consumer Protective Services -** Consumer Protection Act, Food Adulteration Act – FSSAI. Quality control and inspection Act**.** Consumer Rights and consumer responsibilities.

COURSE OUTCOME

1. Identify the major influences on consumer behavior.
2. Analyze the implications of demand and supply.
3. Implement wise buying practices.
4. Explain consumer protection legislations and standards.
5. Assess the quality of a product based on the knowledge gained.

References

1. Gupta, C.B. and Nair, R.N (2004). Marketing Management: Sultan Chandand Sons,
2. Juliana, M (2011). Green consumerism, United States: SAGE Publishers.
3. Kathiresan, S. Radha, V (2004), Marketing: Chennai, Prasanna Publisher.
4. Kumar, N., (1999), Consumer Protection in India, Delhi, Himalaya Publishing House.
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.

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Third Year **CORE COURSE V** **Semester: V**

FOOD PROCESSING AND PRESERVATIC

Code: **(Theory)** **Credit: 5**

COURSE OBJECTIVES: To enable the students to

- To acquire knowledge of food preservation and preservation technique.
- To know the importance and basic principles of food preservation
- To understand the principles behind the various methods of food preservation.
- To know how to use these principles to preserve different types of foods.
- To study the method of action of different preservatives.

NIT -I PROCESSING AND PRESERVATION OF CEREALS & PULSES

Definition of Cereal Processing and Importance of Preservation

Processing of Cereals (Rice, Wheat & Millets) - Pre-processing, Milling, Cooking, Fermentation, Extrusion.

Processing of Pulseproducts-Pre-processing, De hulling, cooking, Fermentation, Sprouting. Fumigation of Pulses.

Preservation Techniques- Drying, Canning, Freezing, Vacuum packing. Fortification of Cereals and Pulses.

UNIT- II PROCESSING AND PRESERVATION OF MEAT AND POULTRY

Meat: Quality standardization of meat of processing. Processed meat products- sausages, burger patties, cutlets.

Poultry: Quality standardization of fresh produce. Steps involved in Slaughtering, Poultry products.

Sanitation & hygiene practices followed in Slaughter houses.

Egg: Quality standardization of raw materials. Processed products- pickled eggs and egg based sauces.

Fish: Quality standardization of raw materials. Fish processing methods, Processed fish product-canned fish.

UNIT III PROCESSING AND PRESERVATION OF FRUITS & VEGETABLES

Quality standards for raw materials used in processing. - Standardization of raw material, primary processing-grading, sorting, cleaning, washing, peeling, slicing and blanching.

Preservation of fruits and vegetables – Canning, Food Irradiation.

Types of drying and dryers utilized- Tray dryers, Freeze dryers, Spray dryers. General principles and manufacturing processes of preserves, candied fruits, glazed
fruits, crystallized fruits.

UNIT IV PROCESSING AND STORAGE OF SPICES AND OILSEEDS

Types of Spices grown in India. Pre and Post-harvest problems during processing, properties, drying, storage. Health and culinary benefits.

Manufacturing process of Indian spice powder and pastes- processing, quality standard, storage.

Quality standards and Pre Processing of oilseeds for oil extraction.

Types of oil extraction: Mechanical and Solvent extraction methods. Steps followed in Oil refining, Hydrogenation, Utilization of de-oiled cake, Quality Control and Testing of oils.

UNIT V PACKAGING SOLUTIONS FOR PROCESSED & PRESERVED FOODS

Definition: Understanding the role of packaging in food processing and marketing. Functions: Key functions of packaging – sustainability, protection, containment, and convenience. Modified Atmospheric Packaging.

Materials: Overview of different packaging materials, such as plastic, paper, and glass, and their specific applications in perishable products.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

1. In your region / community, list the foods that are preserved at home and identify the method and preservatives used forpreservation.
2. Identify the processed food made using artificial sweeteners thatare available in your area.

REFERENCES:

1. Manay, N.S. Shadaksharaswamy, M. (2004), "Foods- Facts and Principles", New age international publishers, NewDelhi.
2. Srilakshmi, B. (2003), "Food Science", New Age International Publishers, New Delhi.
3. Subalakshmi, G and Udipi, S.A. (2001), "Food processing and preservation". New Age International Publishers, NewDelhi.
4. ShafiurRahmanM.: Hand Book of Food Preservation, Marcel Dekker Inc,New York.
5. PrakashTriveni : Food Preservation, Aadi Publication, DeSivasankar Food Processing and Preservation, Prentice Hall India Learning Private Limited (1 January 2002)
6. Gopala Rao, Chandra. "Essentials of Food Process Engineering". B.S. Publications, 2006.
7. Desrosier N. W. The Technology Of Food Preservation;BS Publishers & Distributors Pvt Ltd, India; 4th edition (1 January 2004)
8. Gould, G. W. (2012), "New Methods of food preservation", Springer Science & Business Media.
9. Ramaswamy H and Marcott M. Food Processing Principles and Applications. CRC Press, 2005
10. Norman N Potter and Joseph H. Food Science by Hotchkiss, CBS Publishers and Distributors.
11. Barbosa-Canovas, Tapia & Cano Novel Food Processing Technologies by CRC Press, 2004.
12. McWillims and Paine : Modern Food Preservation, Surjeet Publication

13. Zeuthen, Peter and Bogh-Sarensen, Leif. “Food Preservation Techniques”. CRC / Wood Head Publishing, 2003.
14. National Center for Home Food Preservation. http://nchfp.uga.edu/
15. Ministry of Food Processing Industries. http://mofpi.nic.in/

COURSE OUTCOMES:

- Apply the principles and methods involved in the processing of different foods
- Discuss and Compare various food processing technology
- Differentiate the mechanisms used in the various methods of preservation
- Identify novel technologies in the processing of food
- Identify high end techniques in food processing and preservation.

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Third Year	CORE COURSE VI FOOD SERVICE MANAGEMENT	Semester: V
Code:	(Theory)	Credit: 5

OBJECTIVES: Students will be able to

- Know the functioning of different types of food service institutions.
- Understand the types of kitchen and kitchen layout
- Comprehend the space allocation and arrangement of food service units.
- Develop skills on the concept of quantity food cookery
- Utilize resources effectively in food service industry.

UNIT – I FOOD SERVICE INDUSTRY:

Types of Food Service Institutions -Commercial and Non-commercial
Definition, objectives and functions of Hotel, Motel, Restaurant, Cafeteria and chain hotels.

Welfare – Hospital, School lunch, Residential establishment and Industrial catering.

Transport – Air, Rail, Sea and Space, Miscellaneous – Contract and outdoor.

UNIT – II FOOD PRODUCTION AND SERVICE:

Food Production: Importance, Principles of Menu Planning in Food Service Institutions, Type of Menu, Techniques of Menu Writing. Standardization of Recipe, Portion Control, Utilization of left over foods in food service institutions.
Food cost control. Book of accounts

Food Service: Formal and Informal types, Styles of Food Services, Centralized and Decentralized System of Service

UNIT – III FOOD SERVICE MANAGEMENT:

Management: Principles, Functions and Tools of Management Resource management -
Money, Time, Energy, Computer applications in menu planning.

Personnel Management: Recruitment, Selection, Induction, Training, Motivation and Leadership, Wages and other welfare benefits for personnel Laws Governing Food Service Establishment pertaining to employees –Labour laws.

UNIT – IV PHYSICAL PLANT, EQUIPMENT AND FOOD PURCHASE:

Layout of kitchens, types of kitchens – Planning, Receiving and storage space of foods, table setting, Dishwashing.

Equipment - Classification, factors involved in selection, use and care of major equipments

Food Purchase- Procedures and Factors involved in the selection of food

UNIT – V HYGIENE, SANITATION AND SAFETY IN FOOD SERVICE INSTITUTIONS:

Definition, importance of personnel hygiene, importance of pest and rodent control in food services. Safety in disposal of food waste. Accidents in food service and safety procedure, legal responsibilities of food service manager FSSAI (Food safety standard authority of

India), Procedures to apply for FSSAI in Tamil Nadu. Entrepreneurship in catering.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Application of principles of sanitation in college laboratory and hostel. Visit to catering institutions to know about organization pattern and personnel Management. Cost comparison of different types of fuel. Explore the different traditional and modern equipments used in food service. Eco kitchen / green kitchen concepts

REFERENCES:

1. West, B.B. and Wood, L. 1979. Food Service in Institutions, John Wiley, New York.
2. Kinton.R And Ceserani,V. 1992.The Theory of Catering . ELBS Publishers.
3. T.Ramaswamy. Principles of Management Himalaya Publication.
4. Subba Rao, P. 2014 Management Theory and Practice, Himalaya publication
5. Swaminathan, M.1979, Food Service and Experimental Foods, Ganesh & Co., Madras
2. Mohini Sethi and Surjeet Malhan, "Catering Management – an integrated approach", 2nd edition, Wiley Eastern Limited, New Delhi, Reprint 2007.
3. Suganthi, V and Premakumari, C. (2017). Food Service Management. Chennai: Dipti Press (OPC) Pvt.LTD.
4. Mary, B. Gregoire, Marian, C. Spears. (2007). Food Service Organizations. United States : Pearson Prentice Hall.
5. Jyoti,S.Sharma. (2006). Food Service Modern Technique and Practices. New Delhi :Akansha Publishing House.
6. Roday, S. (2017). Food Hygiene and Sanitation. (2nd ed.). India: McGraw-Hill Education (India) Pvt Limited.
7. https://www.ccohs.ca/oshanswers/hsprograms
8. https://www.eatrightpro.org/practice/practice-resources
9. https://www.ers.usda.gov/topics/food-markets-prices/food-service-industry.aspx
10. https://theicn.org/
11. www.fssai.gov.in

COURSE OUTCOMES:

- Elucidate the origin and categorization of food service sectors.
- Develop skills in volume food production, various styles of services
- Employ the basic principles and tools of management for efficaciously handling an establishment and utilize the expertise obtained for managing human resources.
- Understand the concepts of layout, equipment in cooking and service area and the food purchase
- Explore the importance of hygiene and safety in the food service units and comprehend the procedures for registration of the units.

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	CORE COURSE VII	**Semester : V**
Third Year	**TEXTILES AND CLOTHING**	
Code:	**(THEORY)**	**Credit: 5**

COURSE OBJECTIVES: Students will be able to

- Obtain a broad understanding of textiles and technical terms involved in textiles.
- Get acquainted with the properties and uses of various textile fibers.
- Develop the skills for identification of fibers and fabrics(yarns, weaves and finishes)
- Develop skills in making wise selection of textiles and acquire knowledge on laundry and stain removal.
- Learn the methods of dyeing, printing, and finishing of fabrics.

UNIT – I INTRODUCTION TO TEXTILES:

Definition of textile fibers, classification of textile fibers, basic unit and polymer bonds in textile fiber, physical and chemical properties of fibers. Fibers: Natural fibers(morphology and polymer system, production, properties); Cellulosic (Cotton, Jute); Protein (Silk, Wool); Man-made fibers (manufacturing process, chemical spinning, properties). Viscose Rayon: Acetate Rayon, nylon, polyester, acrylic, elastomeric.

UNIT – II YARN AND FABRIC YARNS:

Classification of yarns: simple, ply and cord; types of yarn: textured and novelty; twist in yarn: "s" and "z", number of twist; properties of yarn: strength, extension, fineness, length, diameter, composition; woven fabrics: looms and its part. Classification of basic weaves: plain, twill, satin; novelty weaves: pile, Leno-Gauze, honeycomb; Knitted fabrics: types: hand knitting, machine knitting and nonwoven fabrics.

UNIT – III COLORATION, FINISHING OF TEXTILES DYES AND CARE OF TEXTILES:

Dyes: classification, components of dyeing and its relation to dye material - auxiliaries, temperature and dye bath: Printing: styles of printing; modern methods of printing; pre-preparation for printing (printing paste, printing table); Finishing: basic finishes- singeing, scouring, bleaching, sizing, weighting, degumming, mercerizing, sanforizing and calendaring; special finishes. Laundry, Storage and Care of Textiles: Introduction, types of water, soaps, detergents methods and care during laundering of different textiles. Traditional textiles of India.

UNIT – IV INTRODUCTION TO CLOTHING CONSTRUCTION:

Anthropometric Measurements: Introduction and importance; instruments used for anthropometric measurements; Standardization and size charts: importance and use of size charts; size charts of child, woman and man; factors affecting selection of fabrics- social factors, economic factors, physiological factors and environmental factors. Design Components - Elements and principles of design- Introduction, basic elements of design, basic principles of design, relation between elements and principles of design to the clothing and fashion; color, line and texture in relation to: age, season, occasion, figure and complexion.

UNIT – V SEWING MACHINES:

Types of sewing machines - Mechanical sewing machine, electronic sewing machine, computerized or automated sewing machine and embroidery machine; parts of sewing machine. Tools and equipment used for clothing construction- measuring tool, drafting tool, marking tool, cutting tool, stitching tool, pressing tool, needles, threads and their relation to fabric; types of needles for hand and machine sewing; selection of right thread, needle for the fabric to be sewn.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Blended fabric, Natural dyes – scrap book.

REFERENCES:

1. Corbman, B. P and Potter, M. D. (1983) Textiles fiber to fabric, International Edition, Mc Graw hill book Co, New York.
2. Dantyagi, S. (1996).Fundamentals of Textiles and their Care. India: Orient Black swan Private Limited.
3. Deepali Rastogi and Sheetal Chopra (2017) Textiles Science, Direct Black swan private ltd, Hyderabad.
4. Practical Clothing Construction – Part I and II, Mary Mathews, Cosmic Press, Chennai (1986)
5. Holman, Gillian. (1997), Pattern Cutting Made Easy, BSP.
6. Booth, J.E. (1996). Principles of Textile Testing. New Delhi: CBS Publishers & Distributors Pvt. Ltd.
7. Hollen, R. N., Saddler, J., & Langford, A. (1979).Textiles. Macmillan Publishers.
8. Joseph, M. (1992), Introductory Textile Science. Sixth edition, California: Harcourt College, Publishers.
9. Madhulika, P. (2013). Weaving. New Delhi: Random Publishing.
10. Needles, L.H. (1986). Textile Fibers, Dyes, Finishes, and Processes. USA, New Jersey: Noyes publications.
11. Rastogi, D., & Chopra, S. (2017). Textile Science. India: Orient Blackswan Private Limited.
12. Sekhri, S. (2011).Textbook of Fabric Science: Fundamentals to Finishing. India: PHI Learning Pvt. Ltd.

13. Tyagi, A. (2016).Handbook of Fashion and Textile Design. New Delhi: Sonali publication.
14. Cream, Penelope, (1996), The Complete Book of Sewing - A Practical Step by Step Guide to Sewing Techniques, DK Publishing Book, New York.
15. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=8x0nJkh/R0vHkX1U70Z/CQ==
16. https://www.gutenberg.org/ebooks/21534
17. https://textilestudycenter.com/textile-books-free-donwload/

COURSE OUTCOMES:

- Develop an understanding of concepts and basics of textiles and define the key textile terms.
- Develop critical understanding of the techniques of yarn and fabric manufacture.
- Identify the fibres, yarn and fabrics for its appropriate use.
- Able to construct garments
- Explain sewing machine and skilled to use

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Year : III **CORE PRACTICAL- V** **Semester : V**

FOOD SERVICE MANAGEMENT AND FOOD PRESERVATION AND PROCESSING

Code: **(Practical)** **Credit: 5**

COURSE OBJECTIVE : To enable the students

FOOD SERVICE MANAGEMENT

PRACTICAL

1. Plan menu for different types of food service institutions-commercial and non- commercial food service institution
2. Preparation of menus for different types of events.
3. Preparation and standardisation of dishes of different cuisines(one portion).
4. Quantity production and service of meals - stepping up of recipeto 50 portions.
5. Table Setting – Cover- A la carte and Table d' hote covers.
6. Napkin folding.
7. Visit to food service units – commercial and non- commercial.
8. Organise food sales.

FOOD PROCESSING & PRESERVATION

COURSE OBJECTIVES: To enable the students to

- To gain knowledge about the preparation of some basic food products
- To use the processes studied in food Processing and preservation course
- To prepare different food products
- To understand how these can be utilized to start a small-scale processing Module.
- It helps the students to gain not only theoretical but also practical knowledge

PRACTICALS

1. Preparation of jam, jelly, marmalades, preserves, candies, Tutti fruity, Glazed, Crystallized fruits, Toffees
2. Preparation of squash, fruit juice concentrate and Ready To Serve (RTS) foods
3. Preparation of Tomato sauce, Tomato ketchup.
4. Preparation of pickles (oil, vinegar and salt based)
5. Preparation of salted, dehydrated, vegetables preserves (vathals)
6. Preparation of dehydrated cereal products (vadams) -Rice, Sago, Rice flakes.
7. Preparation and preservation of any product using chemical preservation
8. Vegetable based dehydrated powders
9. Spice based dehydrated powders
10. Fermented pickle

REFERENCE:

1. Niir Board(2012), Modern Technology on Food Preservation, Asia Pacific Business Press, New Delhi.

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Third Year **MAJOR BASED ELECTIVE I** **Semester: V**

1) COMMUNITY NUTRITION

Code: **(Theory)** **Credit: 3**

COURSE OBJECTIVES: To enable the students

- Gain insight into the national nutritional problems and their implications
- Gain knowledge about methods of nutritional assessment and modes of extending nutrition knowledge to community.
- Appreciate the national and international contribution towards nutrition improvement.
- Develop skills in organizing and evaluating nutrition projects in the community

UNIT – I NUTRITIONAL DEFICIENCY DISEASES IN INDIA:

Definition – Health, Nutrition, Malnutrition- Undernutrition and Overnutrition, Effect of malnutrition on human development Prevalence of Macronutrient deficiency diseases - PEM, Micronutrient deficiency diseases- Vitamin A deficiency diseases, anaemia, fluorosis ,Goiter in India. Causes of malnutrition in India: i) Socio-economic factors - poverty, population explosion, unemployment and under employment, illiteracy, family planning, food production, food insecurity, Public Distribution System (ii) Cultural factors – food habits, attitudes, taboos; food fads and fallacies.

UNIT – II ASSESSMENT OF NUTRITIONAL STATUS:

Importance and objectives of assessing nutritional status of a community. Methods - Direct assessment- Nutritional anthropometry - Height, weight- Indices used to measure malnutrition; MUAC, Chest circumference, Head circumference, skinfold thickness, Waist and hip circumference and waist hip ratio ii) Clinical examination iii) Biochemical methods
iv) Diet Survey Indirect assessment-Vital statistics – IMR, MMR, PNMR, NNMR

UNIT – III NATIONAL AND INTERNATIONAL NUTRITIONAL ORGANISATIONS:

National organisations – Objectives and functions of ICMR, NNMB, NIN, NFI, NSI, FNB. National Nutrition Policy – Aim, Direct - short term nutrition intervention, Indirect -long term nutrition intervention. International organizations - Objectives and functions of WHO, FAO, UNICEF, World Bank; Contribution towards national development.

UNIT – IV NUTRITION INTERVENTION PROGRAMMES:

Integrated Child Development Services – Objectives, beneficiaries, components and challenges in providing services. Chief Minister's Nutritious Noon Meal Programme - Objectives, beneficiaries, components and challenges in providing services. National Prophylaxis Programmes - Objectives, Beneficiaries and Components of National Anaemia Prophylaxis Programme- Long term and short term strategies; National Goiter Prophylaxis Programme; National Vitamin A Deficiency Diseases Prophylaxis Programme - Long term and short term strategies.

UNIT – V NUTRITION EDUCATION:

Definition, Need, Objectives, Implementation, Importance of Nutrition Education for the Community. Methods of Nutrition Education- Audio Visual Aids – Projected and non-

projected. Nutrition Education Programme - planning, execution and evaluation. Concepts and purpose of KAP study; Use of computers to impart nutrition education – power point presentation, preparation of e-learning module.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Prepare different types of visual aid for the nutrition education. Nutritional status assessment for self and peers. Spot study - ICDS and Noon meal functioning.

REFERENCES:

1. Swaminathan, M., (2007), Essentials of Food and Nutrition, An Advanced Textbook Vol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore.
2. Srilakshmi, B., (2008), Nutrition Science, New Age International publishers (P), Ltd, Chennai.
3. Joshi, S.A., (2007), Nutrition and Dietetics, II Edition, Tata McGraw-Hill Publishing Company Ltd., India.
4. Reddy, R.S., (1997), Nutrition and Health Education, Commonwealth publishers, New Delhi.
5. Mishra, R.C.,(2005), Health and Nutrition Education, A.P.H Publishing Corporation, New Delhi.
6. Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab,L., M.J., (2005), Public Health, Nutrition, Blackwell Publishing Company, UK.
7. https://www.academia.edu/43641174/Community_nutrition_a_handbook_for_health_and_development_workers
8. https://ujlink.uj.ac.za/
9. www.worldcat.org
10. www.nal.usda.gov/legacy/fnic/life-stage-nutrition
11. https://www.medicosrepublic.com/community-nutrition-pdf-free-download/

COURSE OUTCOMES:

- List the nutritional problems and their implications in national development.
- Discuss the methods of nutritional assessment and modes of extending nutrition knowledge to community.
- Relate the objectives and functions of national and international agencies in alleviating the nutrition and health problems.
- Compare the components and beneficiaries of nutrition intervention programmes in India
- Plan and develop skills in organizing and evaluating nutrition education programmes in the community

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Third Year	MAJOR BASED ELECTIVE I 2) HOME SCIENCE EXTENSION AND COMMUNICATION	Semester: V
Code:	(Theory)	Credit: 3

OBJECTIVES: To enable the students to

- Understand the concept of Communication and its role in exchange of information
- Examine the models and barriers to communication
- Learn about the concept of extension, extension approaches and models
- Enhance the students in the selection and use of media in different socio-cultural environment

UNIT – I CONCEPT OF EXTENSION EDUCATION:

Meaning, objectives and principles of Extension Education and Home Science Extension Education; Role of home science in developing a community. Historical review of extension education in India and abroad; Role and qualities of an Extension worker; Role and Functions of Extension Educator; Qualities of extension educator; Role of Home Science in National Development.

UNIT – II COMMUNICATION CONCEPT AND MODELS:

Meaning, definition, nature, scope and importance of communication Functions of communication – information function, command or instructive function, influence or persuasive function and integrative function. Elements of communication - three elements-source, message, receiver; four elements-encoding, decoding, sender and receiver; five elements- communicator, communicate, message, channel and feedback. Means of communication- oral, written, sign/signal, action, object; types of communication - formal and informal communication; pattern - one way, two way, circular; communication media-print and electronic media; advantages and disadvantages of communication media. Models of communication- Aristotle model, Shanon-Weaver mode, Berlo model and Scharmm model.

UNIT - III EFFECTIVE COMMUNICATION:

Characteristics of effective communication- clear, correct, complete and precise message, reliability, consideration of the recipient; skills- observance, clarity and brevity, listening and understanding, self-efficacy and self confidence; significance- team work, team building, problem solving and decision making skills, facilitate creativity and reduces misunderstanding; concepts relating to communication- perception, fidelity, communication gap, empathy, homophily and heterophily. Barriers to communication- semantic, psychological, organizational and personal.

UNIT - IV COMMUNICATION AND EXTENSION:

Communication and Extension - concept, need, functions, principles and scope of extension; steps in extension teaching; elements of extension communication system; communication methods in extension- group method, mass method and individual method; pros and cons of communication and extension.

UNIT – V EXTENSION MODELS AND APPROACHES:

Models- Innovation transfer model, Social education model, Indigenization model, Social action/Conscientation models, Empowerment participation model, Combination models; approaches- general extension, commodity specialized, training and visit, agricultural, extension participatory, project, farming systems development, cost sharing and Educational Institution approach.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only): Learning

Current Government programs for families in urban or rural area

REFERENCES:

1. Dahama, O.P. and Bhatnagar, O.P. (1987). Education and Communication for Development. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Gupta, D. (2007). Development Communication in Rural Sector. New Delhi: Mukhopadhyay, Abhijeet Publication.
3. Nisha, M. (2006). Understanding Extension Education. New Delhi: Kalpay Publications.
4. Reddy, A. (2010). Extension Education. Sree Lakshmi Press, Bapatla.
5. Joshi Uma (1997). Text Book of Mass Communication and Media. Anmol Publications: New Delhi.
6. Ray, G.L. (2013). Extension communication and Management , Kalyani Publications, India
7. Rogers Everett, M. (2003). Diffusion of Innovations, 5th Ed. New York: The Free Press
8. Singh, U.K and Nayak, A.K. (2007). Extension Education. New Delhi: Common Wealth, Publishers.
9. Wilson, M.C., and Gallup, G. (1955). Extension Teaching Methods. Washington: US Department of Agriculture.
10. Nair, R.(1993). Perspective in Development communication, Sage Publications, New Delhi.
11. Pankajam, G (2000). Extension- Third Dimension of Education, Gyan Publishing House, New Delhi.
12. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=8x0nJkh/R0vHkX1U70Z/CQ==
13. https://onlinecourses.swayam2.ac.in/cec19_mg32/preview
14. http://ecoursesonline.iasri.res.in/course/view.php?id=243

COURSE OUTCOMES:

- Describe the association between Home Science and Extension
- Gain knowledge on the need and importance of communication and its significance in exchange of information
- Able to communicate effectively with the community
- Analyse the models of Communication and role of media in societal development and perceive the importance of extension education.
- Acquire knowledge on the extension models and approaches

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Year: III **SKILL BASED ELECTIVE I** **Semester: V**

BASICS IN RESEARCH AND COMPUTER APPLICATIONS IN HOME SCIENCE

Code: **(THEORY)** **Credit: 2**

COURSE OBJECTIVES: Students will be able to

- Know the basics of computers.
- Create awareness of the ways in which information technology is used in practical and work-related situations.
- Explore computer applications in health education, practice, administration and research.

Unit –I Fundamentals of Research:

Definition, objectives, importance and characteristics of research. Steps in research process. Research problem – Definition, selection, Necessity of defining the Problem, Technique Involved in Defining a Problem.
Types of research- Descriptive, Analytical, Applied, Fundamental, Quantitative, Qualitative, Conceptual and Empirical research. Research Design .

Unit-II Sampling and Scaling Technique

Sampling Methods-Probability and non probability sampling methods.
sample size and Sampling errors.
Scaling Techniques: Comparative (Rank Order, Paired Comparison and qsort) and Non-comparative (Likert Scale, Thurston Scale, Semantic Differential Scale)

Unit- III Data Collection and Research writing:

Primary data collection methods - preparation of schedules and questionnaires. Interview method of enquiry, training of interviewers. Secondary data collection method- Reliability of data, suitability of data, adequacy of data. Processing of data – Editing, Coding, Classification and Tabulation.
Research Writing:
Research report writing and Research Ethics Components or layout of a thesis - Introduction, review of literature, methodology, results and discussion, summary and conclusion, bibliography, footnotes and appendix.

UNIT – IV MS OFFICE

MS-Word : Creating and formatting a document, Table creation and operation. Processing of data – Tabulation& Graphical representation of data, guidelines for writing references and bibliographical citation. Plagiarism-code of ethics and Application of plagiarism software (in brief).

MS EXCEL AND DATA ANALYSIS: Starting excel Work sheet, cell, inserting data into rows or columns Sorting data, auto sum. Generating graphs, Integrating charts with WORD. Data Analysis using MS Excel.
MS POWERPOINT: Starting MS – PowerPoint. Auto Wizard, creating a presentation using auto content wizard. Blank presentation, creating,Adding ,Editing a slide and saving a presentation. Animation and transition slide. Printing presentation documents .

UNIT - V COMPUTER AND MOBILE APPLICATIONS IN THE FIELD OF HOME SCIENCE:

Learning the application of softwares and mobile apps in the field of Home science. Websites related to all fields of Home Science: PubMed & Medscape, Literature search strategies. Uses of computer applications within hospitals and the healthcare system, Design of interiors, Design of clothing , Google forms and add ons in Google apps.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Preparation of MS PowerPoint with animation effects on any related topics of home science. Installation of Google apps and create a Google form on any topic of home science. Create different types of chart and graphical representation.

REFERENCES:

1. Best, JW and Kahn, JV (1992) Research in Education.6th ed. New Delhi, Prentice Hall of India Pvt. Ltd,.
2. Kothari, CR (2004) Research Methodology, Methods & Techniques, 2nd ed. New Age International Publishers.
3. Goode, WJ and Hatt, PK (1981) Methods in Social Research, McGraw Hill International Editions, Sociology Series.
3. Kerlinger, FN (1983) Foundations of Educational Research. 2nd ed.
4. Marjory L. Joseph, William D Joseph (1996) Research Fundamentals in Home Economics / Human Ecology. Plycon Press. WHO (2001) Health Research Methodology – A Guide for Training in Research Methods.
5. Subramanian, S., (1999), Introduction to Computers, S. Chand Publishers.
6. Norton, P., (2017), Introduction to computer, Tata Mc Graw Hill Publishing Co Ltd., New Delhi.
7. Nagpal, D. P, (2000), Mastering Microsoft Office 2000, Wheeler Publishing, New Delhi.
8. Saxena. S, (2000), MS Office 2000 for Everyone, Vikas Publishing House; First Edition.
9. Ahilya. R, (2016), Computer, Lucent Publications; VIII Edition.

COURSE OUTCOMES:

- Use internet for learning in the field of home science.
- Proper way to document the data collected
- Choose right way of charts and graphs to improve the presentation of reports
- Explore the different mode of preparation of powerpoint presentation using objects
- Widen the knowledge on apt websites and apps to be used for practice.

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Third Year	CORE COURSE VIII Human Development	Semester: VI
Code	(Theory)	Credit: 5

COURSE OBJECTIVES: To enable students to

1. Understand the concepts, scope, dimensions and interrelations of human development
2. Aware about the social and cross-cultural contexts in human development.
3. Intervene the field of human development.

UNIT-I **15 hours**

Child development and Maternal prenatal health

Principles and Stages – Continuous development – Development is sequential – Stages of growth and development – Maturation and learning – Direction of growth.

Prenatal development –signs of pregnancy, conception, periods of prenatal development, test tube baby, management of normal pregnancy – hygiene, diet and medical supervision and hazards during pregnancy.

UNIT-II **15 hours**

Labour and Neonate

Labour- signs of labour, stages of labour, types of birth, multiple pregnancy, prevention of gynecological problems.

Neonate - Adjustment of the newborn to temperature, breathing, feeding and elimination.

UNIT-III **15 hours**

Infancy

Infancy (birth to 2 years) – Development – physiological and motor, social, emotional cognitive and language, minor ailments.

Effect of stimulation – care of infants, feeding, toilet training, bathing, clothing, sleep, immunization, prevention of accidents-importance of psychological needs.

UNIT-IV **15 hours**

Early and late childhood

Early childhood (preschool stage 2-6 years) – physiological and motor development, emotional, social, cognitive and language development, creativity, importance of play, importance of family relationship, #behavior problems – causes and treatment#.

Importance of preschool education. **Late childhood (elementary school period 6-12 years)** developments – physiological, social, emotional, cognitive and language. **Children with special needs** – identification and rehabilitation.

UNIT-V

Adolescence (12 – 18 years) – physiological, emotional, intellectual and motor development, personal adjustment and maladjustment. Juvenile Delinquency – causes, prevention and rehabilitation. Drug addiction and alcoholism – rehabilitation. Sex education. **Adulthood (18-60 years)** – characteristics and development tasks. All aspects of development and vocational development.

Old age (60 years and above) – physiological and psychological changes, problems of the aged,

family attitude towards the aged, place of the aged in Indian society.

REFERENCE BOOKS

1. Sushila srivastava and K. Sudha Rani, Text Book of Human development A life span developmental approach, First Edition, S. Chand & company pvt (2014).
2. A.C.Harris, Child development. St. Paul: West Pub. (1986)
3. R.M. Lerner, and F. Hultsch, Human development: A life-span perspective (pp.247-253), New York: McGraw Hill Book Co. unit VI, Unit VII (1983).
4. P. Mussen, J.J. Conger, J.Kagan, and A.C. Huston, Child Development and Personality. New York: Harper and Row. Unit I pp 12-18 (1990).
5. Sushila srivastava and K. Sudha Rani, Text Book of Human development A life span developmental approach, First Edition, S. Chand & company pvt (2014).

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Third Year **CORE COURSE IX** **Semester: VI**

PRINCIPLES OF RESOURCE MANAGEMENT AND INTERIOR DESIGN

Code: **(THEORY)** **Credit: 5**

COURSE OBJECTIVE :

1. To enable the students to understand concepts and principles and functions of management.
2. To recognise the importance of wise use of resources to achieve ones goal.
3. To acquire the knowledge of various elements and principles of art in interior.
4. To learn skills in using the basic principles of art at home in commercial situations and other occasions.
5. To apply theoretical knowledge of interior decoration to practical situations

UNIT-I Resource Management:

Understanding, meaning, classification and characteristics of resources, factors affecting utilization of resources. Maximizing use of resources and resource conservation. Availability and management of specific resources by an individual / family –money, time, energy, space Functions of management: Decision making, planning, supervising, controlling, organising.

UNIT-II Design and good taste:

Objectives of aesthetic planning, beauty, expressiveness, functionalism. Concept of design, purpose of design, elements of design, types of design, structural design, and decorative design. Colour: Sources of colour- dimension of colour (hue, value, intensity / chroma). The prang colour system (primary, secondary, intermediate hue, tertiary and quaternary colour) Procedure for making a colour scheme for a room: factors affecting the use of colour scheme for room (the room, mood, style, fashion, personality, possessions). Application of art principle in the use of colours for a room (balance, proportion, harmony, rhythm, emphasis).

UNIT-III

Lighting: Sources of light (natural, artificial light). Types of Lighting: General / ambient lighting, task lighting, accent lighting. Requirements of an Ideal Lighting Installation- Steadiness of the source of light, elimination of glare, avoidance of shadows, sufficient illumination to suit the nature of the visual task, nonproduction of excessive heat, minimum consumption of oxygen from the air.

UNIT-IV

Furniture: Requirement and arrangement in the home, materials used in furnishing items. Furnishing: Different types of furnishing, factors considered in the selection of furnishing. Floor Coverings: Factors for selecting floor coverings, salient features of carpet, types, use and care of floor coverings.

UNIT-V

Accessories: Selection, types ,use and care of accessories,. Traditional and Modern: Art objects, pictures Flower Arrangement: Principles, types and steps in preparing flower arrangement.

Reference :

1. Graig. H.T., And Rush, C.H. “Homes with Character”, D.C. Health and Company, Boston, 1965.
2. Alexander, M.J., “Designing Interior Environment”, Har court Brace Jauaroui Inc., New York. 1972.
3. Sherwood, R.F. “Homes Today and Tomorrow”: Chart Bannet, Co., Inc., PEORIC, Illinois, 1972
4. Premavathy Seetharaman and Parveen banu “Interior Design and Decoration” CBS Publishers, New Delhi, 2007.
5. Nickell.P. and Dorsey. J.M. – “Management in Family Living”, John Wiley and Sons, Inc, New York, 1960.
6. Goldstein. H and Goldstein. V. “Art in Everyday Life”, Macmillan and Company, New York, 1966.
3. Rutt, A.H., “Home Furnishings”, John Wiley and Sons, New York, 1961
7. Roy Day, “All about Decorating Your Home” Hamlyn, London”, 1976

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Third Year **CORE PRACTICAL VI** **Semester: VI**

PRINCIPLES OF RESOURCE MANAGEMENT AND INTERIOR DESIGN

Code **(Practical)** **Credit: 4**

PRACTICALS:

1. Know the use of various elements and principles in the design
2. Identify drawing tools and mediums used and their respective functions
3. Use various accessories to decorate the room
4. Develop an art of flower arrangement style
5. Develop skill in layout design for Interiors
6. List of Practical
7. Design – Harmony, Emphasis, Proportion, Balance, Rhythm
8. Colour- Prang Colour System
9. Accessories- types and care of accessories
10. Flower arrangement- types
11. Floor covering for different rooms

Reference :

1. Rendering with Pencil and Ink|| by Gill Robert W., Published by Thomos and Hudson, New Delhi
2. Interior Design|| by Ahmed A. Kasu , Published by Sunrise Publisher, New Delhi
3. Architectural Aesthetics|| by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh
4. Learning Curves|| by Klara Sjolen and Allan Mcdonalds by Perfect Paperback Publishers.
5. The Complete Book of Drawing|| by Barrington Barber by Perfect Paperback Publishers.

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Year: III **MAJOR BASED ELECTIVE II** **Semester: VI**

1) FOOD SAFETY AND QUALITY CONTROL

Code **(Theory)** **Credit: 4**

UNIT I : Introduction to Food Safety

Definition- Food safety, Risks and hazards: Food hazards – Physical, Chemical and Microbial.
Food Hygiene and Handling – Definition, Basic aspects of Personal Hygiene, Education of food handler in handling and serving food, Importance of personal hygiene of the food handler.

UNIT II National Food Authorities

Food Safety and Standards Act & FSSAI– structure and organizational chart, responsibilities of the food business operator, licensing and registration of food business.
Food Safety Officer and their roles. Food Analysist and their roles.
Laws relating to food processing industries in India – AGMARK, Essential Commodities Act, BIS, ISO 22000 and APEDA.

UNIT III Universal Food Authorities

World Trade Organization- functioning and responsibilities. Codex alimentarius- history, operations & responsibilities.
WHO– history, operations and responsibilities. ICGFI, FDA,
MMPO– Role and functions

UNIT Quality Control Measures

Introduction, Subjective and Objectives of food evaluation
Food adulteration: common adulterants, simple tests for detection of adulteration. Food additives-classification, functional role and safety issues, types of adulteration and recent trends in food adulteration.
Food Hazard Control Measures – FSMS, HACCP, GMP, CGMP, GHP and GAP

UNIT V Food packaging and labelling regulations

Introduction to food packaging, importance, types, regulations and specification, testing and quality control of packaging materials and packaging laws.
Introduction to food labeling. Importance of food labeling and nutritional labeling. Labels-regulations and specifications and labelling laws.

Text Book (s):

1. Ali, A. A., & Joshi, S. Food Safety and Quality Management: A Comprehensive Approach. CRC Press.(2018).
2. Potter, N.N., Food Science, CBS Publishers, ND.2007 Sethi, Mohini, Food Science, CBS Publishers,ND. 2001

3. Mahendru, S.N.Food Additives, Tata McGraw Hills,ND.2009 Manay, N.S. Foods: Facts & Principles, Wiley Eastern Ltd.,ND.2005

CO Statement

Defining the food safety, hazards and hygiene

Relating the national systems and organizations involved in food safety

Examine the regulating international authorities for food safety

Categorizing the quality control measures

Defending the food packaging and food labeling regulations

Third Year	**MAJOR BASED ELECTIVE II 2) BAKERY AND CONFECTIONERY**	**Semester: VI**
Code:	**(Theory)**	**Credit: 4**

UNIT I INTRODUCTION TO BAKERY :

Bakery- Definition, aims , principles, objectives and classification of baking products. Personal hygiene and bakery hygiene required for bakery personnel.Bakery equipment and tools. Identification and handling of raw materials. Permutation formula - °C to°F and °F to°C .Oven at different baking temperatures.

UNIT II ROLE OF MAJOR AND MINOR INGREDIENTS IN BAKING :

Role of Major Ingredients : Flour -Types, Flour test and Grading. Millet based flour - types and uses of flour incorporated items biscuits,cookies ,bread ,cake and pastry.Role of yeast, fat and egg in baking. Shortenings - Definition, types and characteristics of good shortenings. Sweetening agent - Definition, types, role and uses of cane sugar, palm jaggery, jaggery and honey. Raising agent - Definition, types of raising agent and role of raising agents. Leavening agents- Definition, types (physical, biological and chemical) and role in baking. Role of minor ingredients: Milk, water, salt, flavours, baking powder and natural colours.

UNIT III RODUCT DEVELOPMENT IN BAKERY

Bread - Definition, types, methods, faults and improvers. Prevention of bread spoilage. Cake - Definition, types, methods, icing and cake decorations. Biscuits and Cookies - Definition, types and methods, general procedure of biscuits and cookies making .

UNIT IV INTRODUCTION TO CONFECTIONERY:

Confectionery - Definition, aims, principles, objectives and classification of confectionery products. Chocolate - Definition, Types, Different forms in which coco and chocolate are available. Process of chocolate tempering. Chocolate designs, garnish and presentations. Ice Creams - Definition, Various types and methods of ice creams and chocolate bombs. Icing - Definition, Types of Icing (Butter icing, Royal icing, Marzipan icing, Fudge icing, Glaze icing, chocolate icing). Casting molds - Gum paste mold, Fruit strapes mold. Storage of confectionery products.

UNIT V PACKAGING OF BAKERY AND CONFECTIONERY PRODUCTS:

Introduction, packaging materials used for bakery and confectionery products. Techniques for packaging of bakery and confectionery products - Flexible packaging, Wrapping styles and Endfold wrappin . Packaging for odd sized biscuits, Modified atmosphere packaging (MAP). Eco-friendly packaging for bakery and confectionery products - Biodegradable Materials, plant-based materials. Eco - labeling and certifications (compostable and biodegradable).

Text Book(s):

1. John Kingslee,"A Professional text to Bakery and Confectionery". New age international (p) Limited , publishers, New Delhi,(2006).
2. Yogambal Ashok Kumar ," Theory of Bakery and Confectionery", PHI Learning private Limited,New Delhi,(2009).
3. Richard W. Hartel "Confectionery science and Technology " (2010)
4. Bhuvaneswari.D and Kavitha.V, "Easy to Bake" Divakar Publications, Trichy(2017).
5. Shri.Anand Yadav , Bakery and Confectionery , Yahwantrao Chavan Maharashtra open University, Nashik (2018).
6. Yogambal Sivalingam, "Textbook of Bakery and Confectionery , Third edition , PHI Learning private Limited (2023).
7. Sanjay singh , Prof. Kavitha gupta,"Introduction to Bakery and Confectionery ",ISBN-13978-8119295395, Tarun publication (2023).
8. K.Arora," Theory of Cookery " Frank Brothers (2008).

COURSE OUTCOMES

Highlighting the basic concepts of bakery and confectionery

Categorize the raw materials used in bakery

Paraphrasing the bakery products development

Presenting of various confectionery products

Defending the various types and technology of packaging

Third Year **Semester: VI**

PROJECT

Code:
Credit: 3

COURSE OBJECTIVES: Students will be able to

- Carry out their own topic of interest in the field of home science
- Acquire experience on the topic chosen
- Familiar with the process of documentation

PROJECT TITLES:

Specific themes can be selected in the broad areas suggested below

Food Science and
Nutrition Food Service
Management Human
development Interior
Decoration
Textiles and clothing
Home Science
Extension

INSTRUCTIONS

- The topic of the project and the supervisor under which the student has to complete the project shall be decide by Lottery Draw method in the beginning of the final year.
- Project components should be decided uniformly for all the students by the respective Heads
- The supervisor is advised to check for the documentation, progress, formatting of the data, conducts mock presentation. Regular review of the progress to be monitored by the supervisor.
- The student shall submit two copies of the report along with soft copies to the University through the Head of the Department on or before the date fixed by the University.
- The last date of submission would be before final semester examination.
- The Project will be evaluated by an internal and an external examiner nominated by the University. The candidate concerned will have to defend his/her Project through a Viva-voce.

ASSESSMENT/EVALUATION/VIVA VOCE:

1. PROJECT REPORT EVALUATION (Both Internal & External)

I. Plan of the Project - 2 marks

II. Execution of the Plan/collection of Data / Organisation of Materials / Hypothesis, Testing etc. and presentation of the report. - 45 marks

III. Individual initiative - 15 marks

2. Viva-Voce / Internal & External - 20 marks

TOTAL - 100 marks

PASSING MINIMUM:

	Vivo-Voce 20 Marks	**Dissertation 80 Marks**
Project	40% out of 20 Marks (i.e. 8 Marks)	40% out of 80 marks (i.e. 32 marks)

A candidate who gets less than 40% in the Project must resubmit the Project Report. Such candidates need to defend the resubmitted Project at the Viva-voce within a month. A maximum of 2 chances will be given to the candidate.

Project Report Description:

- Page Limit Cover to Cover - 30 Pages
- Font size12, Times New Roman, 1.5 spacing
- Inclusive of Plates, graphs and limit to 10 each
- Bibliography APA style
- Soft Binding and duly attested by guide and certified by Head of the Department

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Year: III **SKILL BASED ELECTIVE II** **Semester: IV**

FUNDAMENTALS OF ENTREPRENEURSHIP DEVELOPMENT

Code: **(Theory)** **Credit: 2**

COURSE OBJECTIVES: To enable the students to

- Develop entrepreneurial skill and encourage the students to become entrepreneurs.
- Gain knowledge in developing a project proposal
- Know the various procedures and practices for starting a small scale unit of production.

UNIT – I INTRODUCTION TO ENTREPRENEURSHIP:

Meaning, definition of entrepreneur, types of entrepreneur - based on the type of business, based on the use of technology, based on ownership, based on gender, based on the size of enterprise - functions of entrepreneur.

UNIT – II PROJECT IDENTIFICATION:

Idea generation and selection- sources of ideas- idea processing and selection - criteria for selecting a particular project.

UNIT – III PROJECT FORMULATION:

Feasibility report of the project and its scope - project life cycle - pre-investment stage, construction stage and normalization stage.

UNIT – IV PROJECT REPORT:

Meaning, contents of project report - general information, project description, market potential, capital costs and sources of finance, working capital requirements and financial considerations.

UNIT – V FINANCIAL ASSISTANCE TO SMALL ENTERPRISES:

Institutions providing financial assistance to small enterprises - national small industries corporation (NSIC) - district industries centre (DIC) - small scale industries development corporation (SSIDC).

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Preparation of model loan application form. Writing a project proposal

REFERENCES:

1. Saravananvel P, (1991): Enterpreneurial Development – Principles, Polices
2. and Programmes, Ess Pee Kay Publishing House, Madras.
3. Gupta & Srinivasan, (2002) Enterpreneurial Development, S. Chand
4. Publications, New Delhi
5. Khanka S.S., (2007): Enterpreneurial Development, S. Chand & Co., New
6. Delhi.
7. Gordon, E. & Natarajan, K., (2017), Entrepreneurship Development, Himalaya Publishing House, Mumbai.
8. Khanka, S.S., (2007), Entrepreneurial Development, S Chand and Company Limited, New Delhi.
9. http://www.freebookcentre.net/business-books-download/Entrepreneurial Development.html
10. https://www.pdfdrive.com/entrepreneurship-development-books.html
11. https://depintegraluniversity.in/userfiles/Entrepreneurship%20Development.df
12. https://www.studynama.com/community/threads/entrepreneurship-development-ebook-notes-book-for-bcom-free-pdf-download.3211/

COURSE OUTCOMES:

- List the types of entrepreneur
- Apply and develop projects based on ideation
- Select a business plan
- Explain the different types of funding agencies suitable for each business venture
- Assess the issues associated with financial resources
- Develop entrepreneurship as career

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