B.P.S. Mahila Vishwavidyalaya, Khanpur Kalan, Sonipat-131305

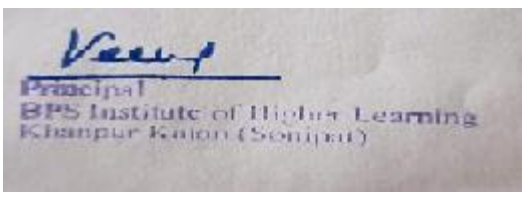
DEPARTMENT OF FOOD AND NUTRITION

COURSE CURRICULUM & SCHEME OF EXAMINATIONS

w.e.f. July,2022-23

MSc. FOOD AND NUTRITION

Programme Code-037



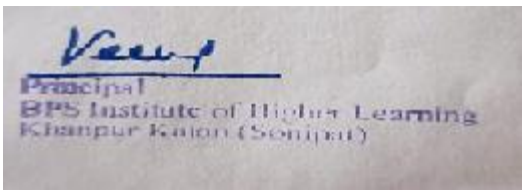
MSc. FOOD AND NUTRITION
Programme Code-037

Programme Outcomes(POs)

- **PO** 1To become proficient in specification of nutrition and able to join as dietician
- **PO 2** Understand the function of all systems and the grounding of science in physiology and health so able to join as Programm officer and CDPOS in villages
- **PO 3** develop knowledge based in institutional food administration and able to develop different food products to run any Hotel, Motel or cafeteria

Programme Specific outcomes (PSOs)

- **PSO1** To make students more specific to join bakery production units, dietetics clinics and confectionary units etc
- **PSO2** To make students more specific to therapeutic diet in hospitals and clinics according to diagnose
- **PSO3** To understand data analysis, editing, coding, classification, tabulation, analysis, graphical presentation of data and interpretation of result for the welfare of public.
- **PSO1** to make students more specific about value added food products with reference to entrepreneurship



B.P.S. Mahila Vishwavidyalaya, Khanpur Kalan

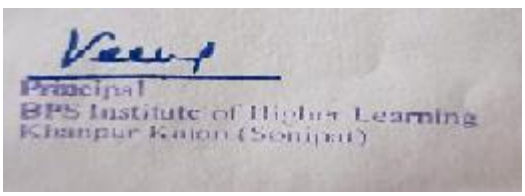
COURSE CURRICULUM & SCHEME OF EXAMINATIONS w.e.f. July,2022-23

MSc Food and Nutrition

Programme Code-037

Semester I

S. No.	Code	Course Title	Hours per Week			Total Credits	Max Marks		
							Internal Marks	External Marks	Total Marks
			L	T	P				
		Theory Courses							
1	MFN 2101	Introduction to Food Science	3	0		3	20	80	100
2	MFN 2103	Biochemistry-1	3	0		3	20	80	100
3	MFN 2105	Diet Therapy	3	0		3	20	80	100
4	MFN 2107	Computer Application	3	0		3	20	80	100
5	MFN 2109	Human Physiology	3	0		3	20	80	100
		Practical/Lab Courses:							
6	MFP 2101	Introduction to Food Science			3	1.5	10	40	50
7	MFP 2103	Biochemistry-1			3	1.5	10	40	50
8	MFP 2105	Diet Therapy			3	1.5	10	40	50
9	MFP 2107	Computer Application			3	1.5	10	40	50
		TOTAL	**15**	**0**	**12**	**21**	**140**	**560**	**700**



Note:-

Passing marks are 50% in internal and external papers separately.

B.P.S. Mahila Vishwavidyalaya, Khanpur Kalan

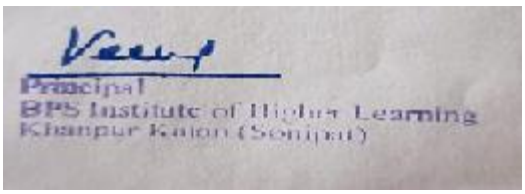
COURSE CURRICULUM & SCHEME OF EXAMINATIONS w.e.f. July,2022-23

MSc Food and Nutrition

Programme Code-037

Semester II

S. No.	Code	Course Title	Hours per Week			Total Credits	Max Marks		
							Internal Marks	External Marks	Total Marks
			L	T	P				
		Theory Courses							
1	MFN 2102	Advanced Food Science	3	0		3	20	80	100
2	MFN 2104	Human Nutrition I	3	0		3	20	80	100
3	MFN 2106	Food Microbiology	3	0		3	20	80	100
4	MFN 2108	Bio Chemistry II	3	0		3	20	80	100
		Practical/Lab Courses:							
6	MFP 2102	Advanced Food Science			6	3	10	40	50
7	MFP 2106	Food Microbiology			3	1.5	10	40	50
8	MFP 2108	Bio Chemistry II			3	1.5	10	40	50
		TOTAL	**12**	**0**	**12**	**18**	**110**	**440**	**550**



Note:-

Passing marks are 50% in internal and external papers separately.

B.P.S. Mahila Vishwavidyalaya, Khanpur Kalan

COURSE CURRICULUM & SCHEME OF EXAMINATIONS w.e.f. July,2022-23

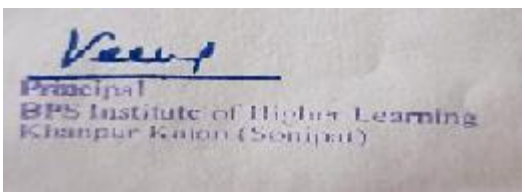
MSc Food and Nutrition

Programme Code-037

Semester III

S. No.	Code	Course Title	Hours per Week			Total Credits	Max Marks		
							Internal Marks	External Marks	Total Marks
			L	T	P				
		Theory Courses							
1	MFN 2201	Community Nutrition I	3	0		3	20	80	100
2	MFN 2203	Human Nutrition II	3	0		3	20	80	100
3	MFN 2205	Research methods and statistics	3	0		3	20	80	100
4	MFN 2207	Institutional Food Administration	3	0		3	20	80	100
		Practical/Lab Courses:							
6	MFN 2201	Community Nutrition I			6	3	10	40	50
7	MFN 2207	Institutional Food Administration			6	3	10	40	50
		TOTAL	**13**	**0**	**12**	**18**	**100**	**400**	**500**

Note:-



The students who will secure more than 70% marks in sem I and II in aggregate would be allowed to pursue theses in a specialized area of students choice after which she will submit a dissertation. Research project will commence from third semester. The evaluation of the theses will be done on the basis of oral presentation, Dissertation and viva-voce. Rest of the students will undertake a course work along with the relevant product development project.

B.P.S. Mahila Vishwavidyalaya, Khanpur Kalan

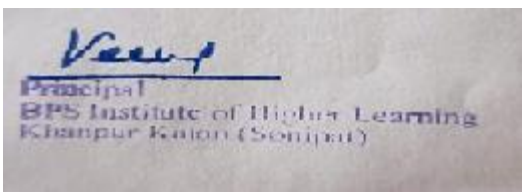
COURSE CURRICULUM & SCHEME OF EXAMINATIONS w.e.f. July,2022-23

MSc Food and Nutrition

Programme Code-037

Semester IV

S. No.	Code	Course Title	Hours per Week			Total Credits	Max Marks		
							Internal Marks	External Marks	Total Marks
			L	T	P				
		Theory Courses :							
1	MFN 2202	Nutition for health and physical fitness	3	0		3	20	80	100
2	MFN 2204	Community Nutrition II	3	0		3	20	80	100
3	MFN 2206	Nutrition in Special Condition	3	0		3	20	80	100
4	MFN 2208 or MFN 2210	Food Product Development or Thesis*	3 4	0 0		3 4	20 30	80 120	100 150
		Practical/Lab Courses:							
6	MFP 2204	Community Nutrition II			6	3	10	40	50
7	MFP 2206	Nutrition in Special Condition			3	1.5	10	40	50



8	MFP 2208	Food Product Development			3	1.5	10	40	50
		TOTAL	**12**	**0**	**12**	**18**	**110**	**440**	**550**

Note:-

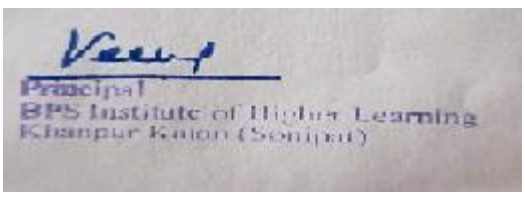
***The students who will secure more than 70% marks in sem I and II in aggregate would be allowed to pursue theses in a specialized area of students choice after which she will submit a dissertation. Research project will commence from third semester. The evaluation of the theses will be done on the basis of oral presentation, Dissertation and viva-voce. Rest of the students will undertake a course work along with the relevant product development project.**

B.P.S. Mahila Vishwavidyalaya, Khanpur Kalan

COURSE CURRICULUM & SCHEME OF EXAMINATIONSw.e.f. July,2022-23

MSc Food and Nutrition

Consolidated Programme Details					
S.No.	Semester	Total Credits	External	Internal	Total Marks
1	I	21	560	140	700
2	II	18	440	110	550
3	III	18	400	100	500
4	IV	18	440	110	550
Total Credits/Marks		**75**	**1840**	**460**	**2300**



INTRODUCTION TO FOOD SCIENCE **SEM. I**
Credits: T 3 P 1
Periods/ week: 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course Objectives:

- The aim of this course is to enable the students to use the knowledge of composition of various food stuffs at home and commercial processing.

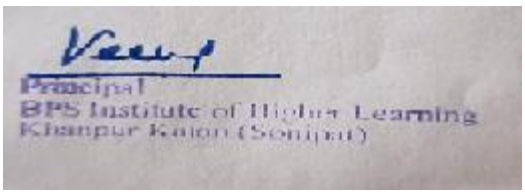
UNIT I

Carbohydrates in food

Sugar: Manufacturing process of sugar, stages of sugar cookery, sugar products.

Polysaccharides:

Starch: Structure, gelatinization, retrogradation, syneresis, gelation, modified food starches, dextrinization.



Non-starch Polysaccharides:Cellulose, hemicellulose and pectins- sources, characteristics in foods.
Cereals- Structure and composition of wheat and rice.

UNIT II

Protein in food.

Plant food – pulses, nuts and oilseeds, composition, antinutritional factors. Fermentation and germination in legumes, cooking quality of legumes.

Animal food-

Milk- composition , spoilage and care, Physical and chemical properties.
Meat, fish and poultry- structure and composition, evaluation of egg quality and grading, use of egg in cookery, Postmortem changes in meat.

UNIT III

Fruits and Vegetable- Classification and composition. Effect of heat on vegetable. Preservation of vegetable and fruits. Fruit Pigments. Browning Reactions

Fats and oils: Physical and chemical properties, Rancidity changes, fat substitutes, Antioxidants and Changes during frying and storage.

Relation of cookery to colloidal chemistry.

Definition of colloidal system altering degree of dispersion, Hydrophilic and hydrophobic colloids, stablization of colloidal system properties i.e. surface chemistry tension, adsorption, foam formation, rheology, gel formation and emulsion.

UNIT IV

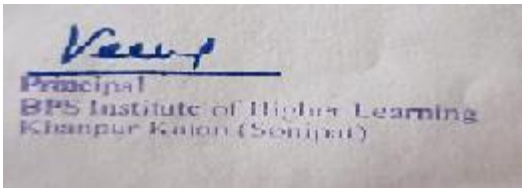
Food processing method: Soaking, sprouting, grinding, cutting, fermentation, boiling, steaming, roasting, broiling, braising, barbecuing, frying, baking, effecting composition and nutritive value of food.
Solar cooker, pressure cooker, microwave ovens, sensory evaluation of product.
Food additives: Definition, importance, classification and uses.
Leavening agents: Importance, classification, nature and use.

Course outcomes: students will be able to:

- To understand the changes occurring in various food stuffs as a result of processing and cooking
- Enable the students to use the knowledge in various application and food preparation

PRACTICAL

1. Weighing and measuring of food items–flours, cereals, pulses, sugar, oils and other liquid foods
2. Standardisation of recipes



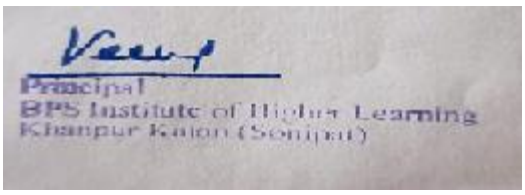
3. Sensory evaluation of recipes
4. Gelatinosation properties of starches
5. Browning of fruits and vegetables
6. Effect of heat on fruits and vegetables
7. Effect of heat and acids on protein of milk
8. Effect of cooking on whole and split pulses and legumes
9. Effect of deep frying on batter from different flours
10. Determination of smoking point of fats and oils
11. Development of gluten in fermented dough

Course outcome

- **To understand the changes occurring in various food stuffs as a result of processing and cooking**
- **Enable the students to use the knowledge in various application and food preparation.**

REFERENCES

1. Experimental Cookery- Low Bells.
2. Food Selection AND preparation- Sweetman, M.D.
3. Handbook of Food Preparation- A.N.Hime Ec. Asso.
4. Our Food – Swaminathan, M, and Bhagiam, R.K.
5. Experimental Foods – Swaminathan.
6. Food Science and Application- L Paul, C, Panling.
7. Food science- Mudambi, S.R. and Rao, S.M. 1994, Wiley Eastern Ltd. New Delhi.
8. Food Facts and Principles- Maney N.S. and Shudarshan Swamy M. 1996. New Age Interational Pub. Delhi.



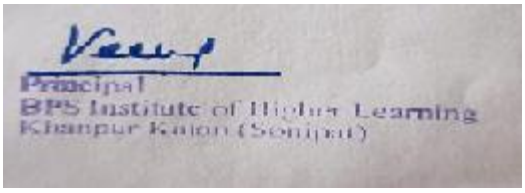
BIOCHEMISTRY I **SEM.I**

Credits: T 3 P 1
Periods/week: 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require toattempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objectives:
To understand the mechanism adopted by human body for regulation of metabolic Pathway



UNIT I

Carbohydrates: Sources, classification, chemistry and function. Dietary fiber and its function. Simple chemical reaction of carbohydrates.

Lipids: Sources, classification, chemistry and function. Saponification and iodine number of fat, Rancidity of fats.

UNIT II

Minerals: Sources, absorption, transport, utilization and function of magnesium, calcium, phosphorus, iron, iodine, copper and zinc.

Proteins: Amino acid as the structural monomer for proteins, Chemical reactions of amino acids, level of structural organization of protein.

Protein classification and biological functions, plasma protein and their function.

UNIT III

Enzymes: Historical perspective, enzyme as biological catalyst, introductory account of IUB system of enzyme classification, concept of active site, specific activity, turnover number, unit of enzyme activity. Effect of substrate concentration on velocity of single substrate enzyme catalyzed reaction. Michaelis constant (km) and Maximal velocity (Vmax). Graphic method of km evaluation: line weaver burk plot. Effect of pH and temperature on enzyme catalysed reaction, various type of enzyme inhibition, isoenzymes

Biological oxidation: Enzyme of biological oxidation, Redox potential, respiratory chain, Oxidation phosphorylation, Mitchell's chemiosmotic hypothesis inhibitors of respiratory chain and Oxidative phosphorylation.

UNIT IV

Nucleic acid: Component of nucleic acid, structure of nucleic acids, and significance of DNA as a genetic material

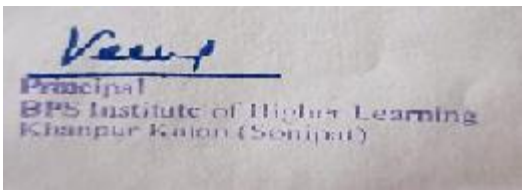
Vitamins: Sources, absorbtion and biochemical role of vitamin A, D, E, K, Thiamin, Riboflavin, Niacin, Pyridoxin, Folic acid, Cynocobalamin and Ascorbic acid.

Course outcomes: students will be able to:

- Get an insight into interrelationship between various metabolic pathways
- To provide an insight of advanced knowledge of functions of nutrients

PRACTICAL

1. Preparation of standard solution.
2. Standardization of a method of blood glucose estimation



3. Estimation of blood glucose of a normal and diabetic person by the method of standardization.
4. Titrametric estimation of vitamin C in lemon juice or any other fresh food stuff
5. Standardization of methods for serum total protein and serum albumin.
6. Estimation of total protein and albumin by the method standardized for a well nourished and protein malnourished person.
7. Formal titration of amino acids
8. Standardization of a method for the determination of reducing sugar.

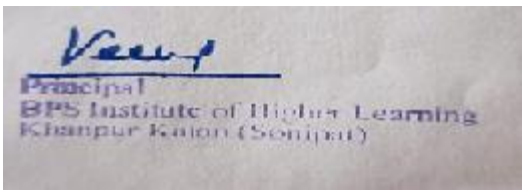
REFERENCES

1. Harpers Biochemistry- Robert K. Murthy
2. Textbook of biochemistry- West and Todd
3. Biochemical aspect of nutrition- S.X.C. Okoyo
4. Food chemistry- O.R. Fennama
5. Principles of Biochemistry- A.l.Lehninger
6. Outlines of biochemistry- E.E. Conn
7. Biochemistry- Voet and Voet

DIET THERAPY **SEM.I**
Credits: T 3 P 1
Periods/week: 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*



- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course Objectives:

- **To understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient's needs**

UNIT I

Metabolic changes, clinical manifestations, complications, dietary management and counselling for:
Obesity,
Underweight,
Diabetes,

UNIT II

Cardiovascular disorders
Metabolic changes, clinical manifestations, complications, dietary management and counselling for the disorders of :
Gastro-intestinal tract-constipation, diarrhoea, malabsorption syndrome

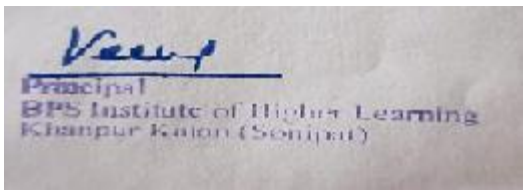
UNIT III

Liver- jaundice, hepatitis, cirrhosis
Gall bladder- cholelithiasis, cystic fibrosis

UNIT IV

Kidney-glomerulonephritis, nephrotic syndrome, renal failure
Fevers, burns and cancer
Nutrition in surgical conditions

- **Course outcomes: students will be able to:**
- Be able to recommend and provide care for prevention and treatment of various diseases.
- To understand the effect of various diseases on nutrition status and dietary requirements



PRACTICAL

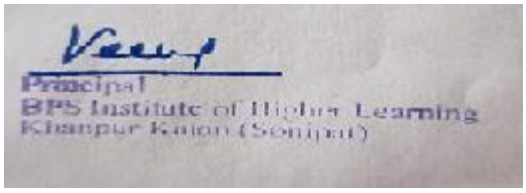
Planning, preparation and serving of diets for common disorders; Using food exchanges in diet planning.

REFERENCES:

1. Mal-Nutrition and the Eyes Donala Sterari Mclaren Academic Press, New York and London.
2. Diabetes Mellitus – Williames and Wikins Co, USA
3. Nutrition andphysical fineness Bogert, L.I
4. Human Nutrition Mc Durtt Maxine
5. Applied Nutrition – Rajalakshini ,R.
6. hand book of diet therapy –Dorothea , Turner.
7. Human Nutrition and dieteties – Davidson .S. Passmore, R. Brock – J.F.andTURSWELL
8. Clinical Dietetices andNutrition –Antia F.P.
9. Food Science andTechnology ,pyke, Macnns.
10. .Modern Nutrition in Health and disease by Goodhearth R.S. Shills.
11. Food and Nutrition - Krause 1972, Saunder

COMPUTER APPLICATIONS **SEM-I**

Credits: T 3 P 1
Periods/week: 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10



Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*
- **Course objectives:** The aim of this course to Familiarize operating systems, computer programming languages, peripheral devices, networking, multimedia, internet, social media and information technology.
-

UNIT I

General awareness of computers and its applications

UNIT II

Introduction to various input and output devices like key board, printers, CD ROM, Mouse, pen drive, floppy, monitors.

UNIT III

Introduction to DOS, MS-DOS, MS-Windows,
MS-Excel use of statistics and preparation of programs

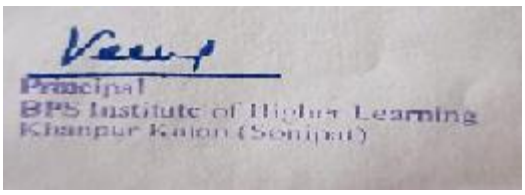
UNIT IV

MS-Word- basic functions, word art, word pad, note pad

MS Power point
Internet- searching for review of literature, Mail, Browsers, Search engines

Course outcomes: students will be able to:

- Bridge the fundamental concepts of computers, applications of computer with the present level of knowledge of the students.



- To understand binary, octal, decimal, hexadecimal number systems and their arithmetic.

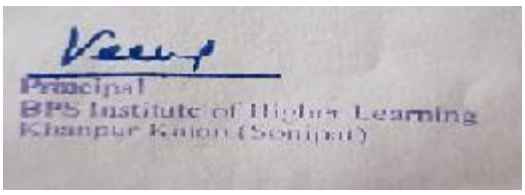
PRACTICAL:

1. Performing statistical calculations using excel programme like determination of measures of centeral tendency, dispersion and t- test.
2. Graphical presentation (using data onquantitative variables like height, weight, Haemoglobin level etc.), make at least five types of graphs,
3. Computer aided nutrition, Computer aided physical fitness, Body Mass analysis with computer.
4. Use of CD and pen drive for data transfer (students will submit a soft copy and a hard copy of power presentation and graphs)
5. Use of internet for data searching
6. Using paper setting activities and the use of printers
7. Maintain a practical file containing print outs of all the above functions.

REFERENCES

1. Gill Nasib Singh : essentials of computer and network technology , khanna books publishing co. new delhi
2. Donald sanders: computer today, McGraw –hill publishers
3. Davis : introduction to computer, McGraw –hill publishers
4. P.K Sinha and Priti Sinha; computer fundamentals

HUMAN PHYSIOLOGY **SEM. I**



Credits: T 3 P 0
Periods/ week: 4
Total Marks**: 100**
External –80
Internal-- 20

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*
-

Course objectives: The aim of this course is to understand the alteration of structure and function in various organ and system in diseases condition.

UNIT I

Digestive system- digestive juices: mechanism of formation and functions, digestion of various foodstuffs and their absorption; liver structure and functions.

UNIT II

Respiratory system–respiration, oxygen and carbon-dioxide carriage by blood, role of respiration in blood, pH and acid-base equilibrium; regulation of body temperature and energy metabolism;

Circulatory system: structure of heart, general circulation of blood; blood composition and functions;

UNIT III

Structure of excretory system-excretion, role of kidney in acid-base equilibrium, stone formation and water exchange.

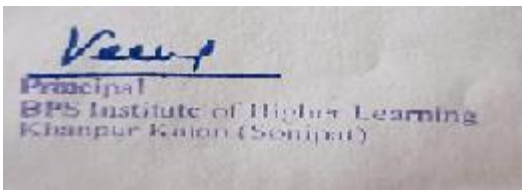
UNIT IV

Reproductive system-sex hormones, menstruation ovulation, physiological changes during pregnancy.

General study of nervous system.

Course outcomes:

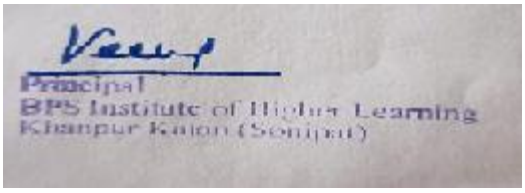
Enable the students to understand the function of all systems and the grounding of science in



physiology

REFERENCES

1. Human Physiology- A.J. Vander.
2. Principle of Anatomy and Physiology- Anagna Stakes.
3. Text book of Physiology Pattern
4. Bloom W. and Fabcott D.W.A. – Text book of Histology W.D.Saunders and Company



ADVANCED FOOD SCIENCE **SEM. II**
Credits: T 3 P 2
Periods/week: 10
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objectives: The aim of this course is too understand the chemical reaction and physical changes which occur during production, processing and storage of foods and their applications.

UNIT I

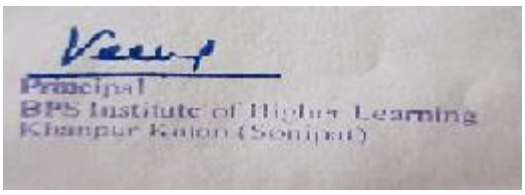
Processing technology of food:

Cereals: Wheat milling process, baking technology, production of bread. Barely malting Rice processing, parboiling of rice.

Pulses: Processing and milling in general, elimination of toxic factors.

UNIT II

Oilseeds: Pressing, solvent extraction, purification (degumming, refining, bleaching, deodorization), hydrogenation, and plasticising.



Fruits & Vegetables*:* Changes during ripening, canning.

UNIT III

Milk & Milk Products: Milk processing, separation and standardization, pasteurization, homogenisation.

Milk products: Fortified milk, skim milk, butter and cheese.

UNIT IV

Meat and Fish Products: - Ageing, tenderizing, curing, smoking, salting, pickling.

Fortification Technology: - Objectives, nutritional signification, selection of vehicle, fortification of salt, cereal products and dairy products.

Extruded Food: - An introduction to extrusion technology : its merits and demerits.

Course outcomes: The students will be able:

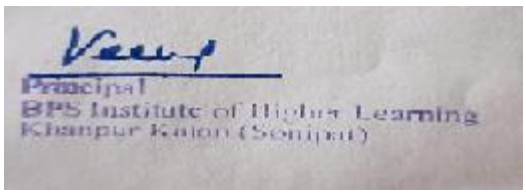
- To gain knowledge regarding the physical and chemical properties of food constituents.
- Be familiar with effect of reaction on quality and safety of foods.

PRACTICAL

1. To study the time, temperature and water required for sprouting whole pulses and vvvfflegumes.
2. To prepare Amylase Rich Foods (ARF) from cereals and to develop energy dense food products from it.
3. To demonstrate the method of preparing peanut butter.
4. To prepare simple extruded food products.
5. To undertake processing of legumes to remove the antinutrients and to develop food products from them.
6. Effect of fermentation on various types of milk proteins.
7. To test the acceptability of texssturized food as an alternative to meat.

REFERENCES:

1. Experimental Cookery- Low Bells.



2. Food Selection AND preparation- Sweetman, M.D.
3. Handbook of Food Preparation- A.N.Hime Ec. Asso.
4. Our Food – Swaminathan, M, and Bhagiam, R.K.
5. Experimental Foods – Swaminathan.
6. Food Science and Application- L Paul, C, Panling.
7. Food science- Mudambi, S.R. and Rao, S.M. 1994, Wiley Eastern Ltd. New Delhi.
8. Food Facts and Principles- Maney N.S. and Shudarshan Swamy M. 1996. New Age Interational Pub. . Delhi.

HUMAN NUTRITION I **SEM. II**
Credits: T 3 P 0
Periods/week: 4
Total Marks:100
External –80
Internal---20
Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

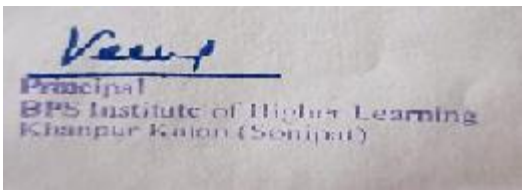
Course objectives:

To understand the concept of body composition and body energetics

UNIT I

Body composition: concept of body composition, biochemical composition, body water, extra cellular fluid, measurement and calculation of body density using Archimedes principle and hydrometry. Calculation of percent body water and body fat from body density. Dilution techniques and calculation of indices of body composition. Lean body weight and fat free body weight. Concept of body cell mass. Application of body composition data.

UNIT II



Energy: concept of energy expenditures and their application. Non respiratory quotient. And its conversion to quantity of carbohydrate and fat (in grams) metabolized. Basal metabolism, BMR and its measurement. Calculation of surface area and monogram, SDA of food and its interpretation.

UNIT III

Carbohydrates: Glysemic index of foods. Sweeteners- nutritive and non-nutritive. Role of carbohydrates in health and disease.

Protein:- Protein quality, method of evaluating protein quality. Therapeutic application of specific amino acids. Branched chain , glutamine arginine, homocysteine, cysteine, taurine.

UNIT IV

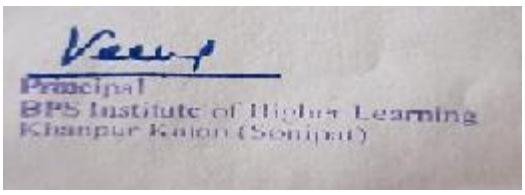
Lipids:- Functions of EFA. Role of n-3,n-6 fatty acids in health and disease. Requirements of total fat and fatty acids. Trans fatty acids. Prostaglandings

Course outcomes: the students will be able to:

- Familiarize students with recent advances in nutrition
- Provide the depth knowledge of physiological and metabolic role of various nutrients and their interaction in human nutrition

REFERENCES:

1. Modern Nutrition in Health & disease - Goodhearty , R.S.
2. Recommended dietary allowance for indian - I.C.M.R.1980
3. Nutrition & Development -Winick 1973, Univ. of Calombia.
4. Biology of Nutrition - Eclames 1972, Palaniuma press
5. Food & Nutrition - Krause 1972, Saunders.
6. Proteins &Human Food 1970, Lowrie, Avi. Pub.Co.
7. Nut.&Physical , fitnees - Bogert L.J.
8. Principles of Nut - Wilson , L.D. & FISHER . K.H.
9. Standerdised diets for Hospital - National Nut. Advisory committee
10. Nutrition in Health &Disease - Cooper ,L. Barher ,L. Mitehell ,Hand Rynherea



FOOD MICROBIOLOGY **SEM. II**
Credits: T 3 P 1
Periods/week: 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

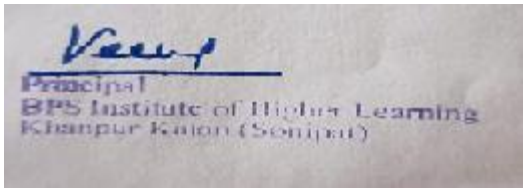
Course objectives: To understand role of microorganism in human and environment

UNIT I

Introduction to microbiology: Important micro flora of air, water and soil.
Microbial growth and factor affecting the microbial growth in food
Nutritional requirement, nutrition types, culture media, and its types, physical condition during cultivation.

UNIT II

Role of microorganism in fermented food.
Genetically modified food
Bacterial food poisoning: characteristics of bacteria, sources of infection, sign and symptoms
Salmonella, Staphylocoocal, Clostridium botulinum



UNIT III

Elementary knowledge of food borne infection
Bacillary dysentery,
Enteric fever,
Cholera,
Diarrhoea.
Sources, food commonly involved preventive measures of above infections.

Food spoilage and preservation: Sources of contamination and microbial spoilage of different food products:

UNIT IV

Milk and milk products
Egg and poultry
Fish and other seafoods
Cereal and cereal products

Course outcomes: The students will be able to:

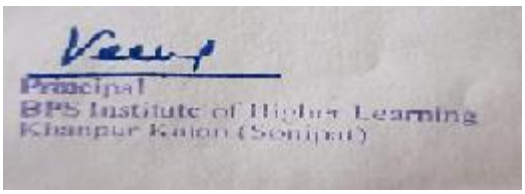
To understand the latest procedures adopted in various food operation to prevent food borne diseases, disorder and other aspects involved in these areas

PRACTICAL

- Cleaning and sterilization procedure of glassware
- To study construction, working and principal of autoclave
- Elementary knowledge of oven and incubator
- Preparation of common laboratory media
- Study of growth of microorganism
- Techniques of culturing on liquid and solid media
- Isolation of bacteria in pure culture
- Growth characteristics of bacteria
- Determination of microbial number
- Plate and slide count
- Bacteriological analysis of water and milk.

REFERENCES

1. Food microbiology- frazier and West Hoff



2. General microbiology- Pawar and Pawar
3. Food microbiology- Adam
4. An introduction to microbiology- P. Tauro
5. Food microbiology- James M. H. Jay
6. Food microbiology- Prescott, Harley, Klein
7. General microbiology- Stanier

BIOCHESTRY II **SEM. II**

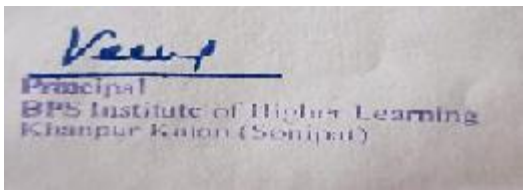
Credits : T 3 P 1
Periods/week : 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*
-

Course objectives:
To understand the mechanism adopted by human body for regulation of metabolic pathway

UNIT I
Comparative study of Glycolysis, alcoholic fermentation as a variant of glycolytic pathway. Direct oxidation (HMP shunt) pathway of glucose metabolism.



Gluconeogensis. All aspect of regulation of blood glucose level. TCA (kreb's) cycle and its significance as amphibiotic pathway.
Comparative study of oxidation pathway of fatty acid catabolism.

UNIT II

Role of carnitine in oxidation of fatty acids.

An overview of protein catabolism in relation to protein nutrition. General reaction of protein metabolism

Biosynthesis of urea - urea cycle (kreb's Hanslet cycle). Biosynthesis of protein. Metabolism of uric acid and its nutritional importance.

UNIT III

Metabolism of ketone bodies metabolism of cholesterol. Lipoprotein metabolism in brief and its relationship with lipid transport and atherosclerosis.

Basic concept of clinical biochemistry and its scope in diagnosis of diseases. Collection and preservation of biological fluids.pattern of functional and non functional enzymes of blood plasma in health and diseases with specific mention to serum lipase, amylase, cholinesterase, alkaline and acid phosphotases, serum transminases, lactate dehydrogenase (CDH) and creatine phosphotase.

UNIT IV

Introduction to functional biochemistry of liver- A brief description of liver functional tests.

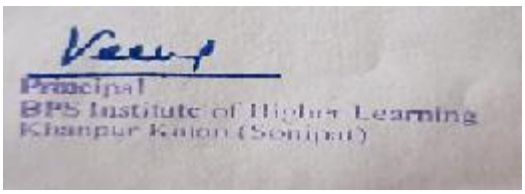
Course outcomes:

To become proficient in specification of nutrition

Get an insight into interrelationship between various metabolic pathways

PRACTICAL

2. Estimation of total, free and conjugated, bilirubin in blood serum
3. Estimation of total and lipoprotein cholesterol in blood serum
4. Estimation of tri glycerides in blood serum
5. Assay of alkaline phosphatase activity in serum
6. Assay of activity of transminases (SGOT, SGPT) in serum
7. Assay of trypsin activity inhibitor by some legume anti nutritional factors
8. Separation of amino acids by paper chromatography



9. Effect of pH conc, time temperature of incubation on enzyme activity.
10. Isolation and estimation of casein from milk. Quantitative estimation of protein by Kjeldahl's. Biuret and lowery's method.

REFERENCES

1. Harpers Biochemistry- Robert K. Murthy
2. Textbook of biochemistry- West and Todd
3. Biochemical aspect of nutrition- S.X.C. Okoyo
4. Food chemistry- O.R. Fennama
5. Principles of Biochemistry- A.l.Lehninger
6. Outlines of biochemistry- E.E. Conn
7. Biochemistry- Voet and Voet

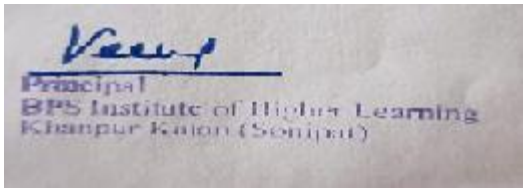
COMMUNITY NUTRITION **SEM III**
Credits : T 3 P 2
Periods/week :10
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objectives:

To understand prevalence, etiology, biochemical and clinical manifestation, therapeutic



measures of prevention of nutrition deficiencies diseases and to understand the problem of community nutrition at different levels

UNIT I

Introduction to concept of community, rural and urban communities, community health, healthcare, community nutritional and its future projections.

Geriatric nutrition: Rising needs of geriatric nutrition in India, metabolic changes during old age and nutrient needs.

UNIT II

Prevalence, etiology, biochemical and clinical manifestation, prevention of therapeutic measures for:

Protein Energy malnutrition

Vitamin A deficiency

Vitamin D deficiency

UNIT III

Prevalence, etiology, biochemical and clinical manifestation, prevention of therapeutic measures for:

Iodine deficiency

Flourosis

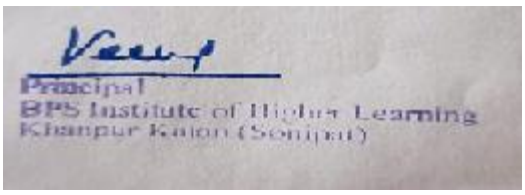
Scurvey

UNIT IV

Beri beri, Pellegra
Identification of target group for nutrition intervention
Programmes for improving nutritional status

Course outcomes: The students will be able:

- To familiarize with the multifaceted aspect of aging and make them competent for nutritional and health care of the elderly
- To familiar with various programmes which can be undertaken to prevent and control nutritional problems at regional and national level



PRACTICAL

Development of low cost recipes for various nutrient deprived patients

Development of low cost recipes for above based on substitute food of better quality

REFERENCES:

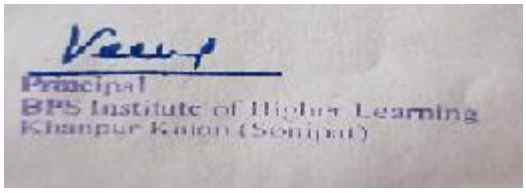
1. Human nutrition –MC Durff , Maxine
2. Applied Nutrition- Rajalakshmi R.
3. Nutrition in India : V.N.
4. Biology of nutrition- Elements 1972 Platinum Press
5. Text book of Human Nutrition : Bamji M.S., Pralhad Rao, N and Vinodini Reddy (Ed) Oxford and IBH publishing Co. Pvt. Ltd. New Delhi.
6. *Mal-Nutrition & the Eyes Donala Sterari Mclaren Academic Press, New York & London.*
7. Hand book of diet therapy –Dorothea , Turner.
8. Human Nutrition & dieteties – Davidson .S. Passmore, R. Brock – J.F.&TURSWELL.
9. Clinical Dietetices &Nutrition –Antia, F.P.
10. Modern Nutrition in Health & disease by Goodhearth R.S. Shills.
11. Recommended dietary allowance for indian - I.C.M.R.1980
12. Nutrition & Development -Winick 1973, Univ. of Calombia.

HUMAN NUTRITION II **SEM. III**

Credits: T3 P 0
Periods/week: 4
Total Marks:100
External –80
Internal---20

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*



- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objectives:

Provide in depth knowledge of physiological and metabolic role of various nutrient and their interaction in human nutrition

UNIT I

Vitamin: Food sources, function, Physiological pharmacological and theraputic effects, toxicity and deficiency with respect to the following:-

Fat soluble: Vitamins A, D, E&K.

Water soluble: Thiamine, riboflavin, niacin, biotin, pyridoxine, folic acid, pantothenic acid, ascorbic acids, cyanocobalamin, choline, inositol.

UNIT II

Minerals: Sources, bioavailability, function requirements, RDI/ESADDI, deficiency and toxicity, interactions with other nutrients.

Macro minerals: calcium, phosphorus, magnesium, sodium, potassium and chloride.

Micro minerals: Iron, copper, zinc, manganese, iodine, fluoride.

Regulation of food intake: Hunger and appetite, gastro intestinal factors in the regulation. Role of hypothalamus, glucose utilization in the body and fat stored in the body as regulators of food intake, regulation of body weight.

UNIT III

Nutrition interrelationship: Concept of nutritional interrelationship, protein-energy, carbohydrates-fat. Niacin- tryptophan pyriodoxine relationship, effect of carbohydrates, fats and protein on vitamin requirements, effect of protein quality and quantity on protein utilization.

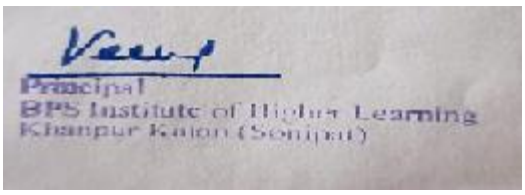
Dietery supplements

UNIT IV

Non-nutritive food components: Polyphenols, tannins, phytates, phytoestrogenes.

A brief overview of nutrition and mental development.

Nutrition and stress:- Stress types, Body'response (endocrine and metabolic) to short term and long term stress. Role of nutrition in stress coping.



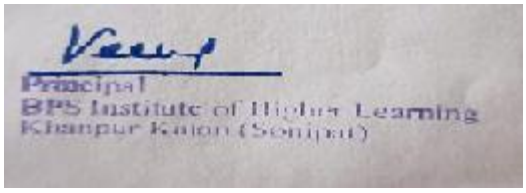
Course outcomes: students will be able:

- To understand the basis of human nutritional requirement and recommendation through the life cycle
- **To** Familiarize with recent advances in nutrition

REFERENCES:

1. Modern Nutrition in Health & disease - Goodhearty , R.S.
2. Recommended dietary allowance for indian - I.C.M.R.1980
3. Nutrition & Development -Winick 1973, Univ. of Calombia.
4. Biology of Nutrition - Eclames 1972, Palaniuma press
5. Food & Nutrition - Krause 1972, Saunders.
6. Proteins &Human Food 1970, Lowrie, Avi. Pub.Co.
7. Nut.&Physical , fitnees - Bogert L.J.
8. Principles of Nut - Wilson , L.D. & FISHER . K.H.
9. Standerdised diets for Hospital - National Nut. Advisory committee

RESEARCH METHODS AND STATISTICS **SEM III**
Credits: T 3 P 0
Periods/week: 4
Total Marks**: 100**
External –80
Internal---20



Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require toattempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objectives:

To understand the significance of research methodology in home science research
To understand the types, tools and method of research

UNIT I

Research Methodology – Meaning, objectives and types of research. Research approaches, Significance of research, Research and scientific methods, Research process and Criteria of good research.

Definition and Identification of a Research Problem – Selection of Research problem, Justification, Theory, Hypothesis, Basic assumptions, Limitations and delimitations of the problem.

Design strategies in research- Descriptive Studies

Brief overview of types of descriptive studies

Correlation studies

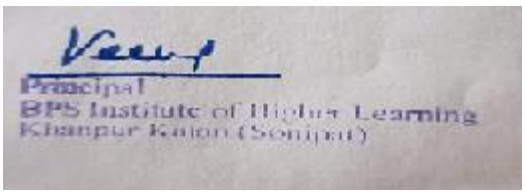
Cross sectional surveys

UNIT II

Research Design – Meaning and needs, Features of a good design; important concepts relating to research design, Variables, Experimental and Control groups, Different research designs– exploratory, descriptive and diagnostic, Hypothesis testing research.

Hypothesis formulation
Descriptive studies
Observational studies

Case control studies



UNIT III

Sampling Design– Population and Sample, Steps in sampling design, Criteria for selecting a sampling procedure, Different types of sampling techniques–Probability sampling and Non-probability sampling. Methods of Data collection–Schedules and Questionnaires, Interview, Case study, Home visits, Scaling methods, Reliability and Validity of measuring instruments.

Methods of data collection:

Interview, Observation and Questionnaire method.

Reliability and validity of measuring instruments: Concept and methods

Report writing

UNIT IV

Meaning and objectives of statistics. Measures of centeral tendency and variability

Normal distribution: Importance and properties, Skewness and kurtosis,

Test of goodness of fit (X^2 test), t-test

Analysis of variance: one way (simple)

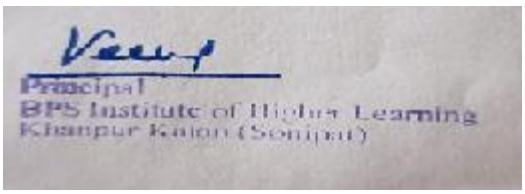
Correlation: Meaning and significance, Product Moment, Rank Difference

Course outcomes: The students will be able:

To understand and apply the appropriate statistical techniques for the measurement scale and design

REFERENCES:

1. Gupta, S.P. Statistical Methods, Sultan Chand & Sons, 1972.
2. George A.Forguson,Statistical Analysis in Psychology and Education, MeGraw Hill Book Co.1965.
3. Scrimshaw, N.S. and Gleason, G.R. (1992) Rapid Assessment Procedures. Qualitative Methodologies for Planning and Evaluation of Health- related Programmes. International Nutrition Foundation for Developing Countries, Boston.
4. Cook T.D. and Relchardt, C.S. (1979): Qualitative and Quantitative Methods in Evaluation Research Sage Publications. London.
5. Patton , M.Q. (1980): Qualitative Evaluation Method. Sage Publications.
6. Morgan, D. (1993): Sucessful Focus Groups.Sage Publications.
7. Mienert, C.L.(1986) Clinical Trials: Designs, Conduct and Analysis. Oxford, New York.



INSTITUTIONAL FOOD ADMINISTRATION **SEM III**
Credits: T 3 P 2
Periods/week: 10
Total Marks**: 100+50**
External—80+20
Internal--- 40+10
Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objective:

- To develop knowledge based in institutional food administration
- To provide practical field level experience in institutional food administration

UNIT I

Food service management:

Principles, functions and tools of effective food service management

Characteristics of various types of food services

Types of service: Table service and dining room management.

UNIT II

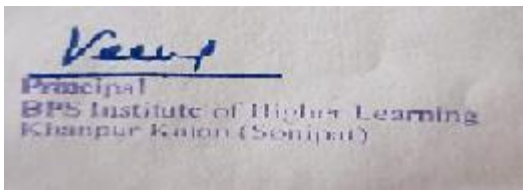
Personnel and financial management
Recruitment, induction, training, motivation and performance appraisal
Food cost analysis
Books, record and record keeping.

Menu planning
Principals involved in menu planning
Techniques of writing menus
Types of menus

UNIT III

Organization of different spaces:

Kitchen spaces



Storage spaces
Service areas

UNIT IV

Equipments planning

Determining Equipment
Selection and placement
Maintenance of equipments

Course outcomes – The students will be able:

- To start their own food service unit leading to entrepreneurship
- To enable students to expertise function as food service management

PRACTICAL

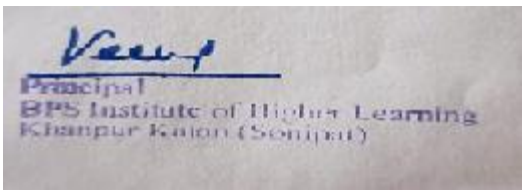
Organizing, preparation and serving of snacks and meals for 50 people, visits to food service institutions.

Planning menus for quantity

Banquet
Packed meals
Restaurant

REFERENCES

1. Food Service in Institution- Wood.
2. Food Service in Institution- West, Bessie, Brooks.
3. Hand book of Food Preparation- A.M. Home Economics Association.
4. Food Selection and Preparations-Sweetman, M.D. 4, Mackellar.
5. School Lunch Room Service- Oliver B. Watson.
6. Food Service Planning Layout Equipment- Lender B. Ketshevar and Margret E. Terrell.
7. Human Nutrition and Dietetics – Davidson and Passmore.



NUTRITION FOR HEALTH & PHYSICAL FITNESS **SEM IV**
Credits : T 3 P 0
Periods/week : 4
Marks : 100
External –80
Internal---20

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course **objectives:** To understand the component of health and fitness and role of nutrition in these areas

UNIT I

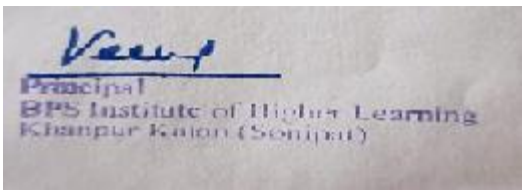
Definitions, Components and assessment criteria of age: specific fitness.

UNIT II

Review of different energy systems for endurance and power activity: Fuels and nutrients to support physical activity
Shifts in carbohydrate and fat metabolism. Mobilization of fat stores during exercise.

UNIT II

Nutrition in Sports specific requirement. Diet manipulation. Pre-game and Post-game meals.
Diet and exercise regime for management of obesity,



UNIT IV

Critical review of various dietary regimes for weight reduction, Prevention of weight cycling

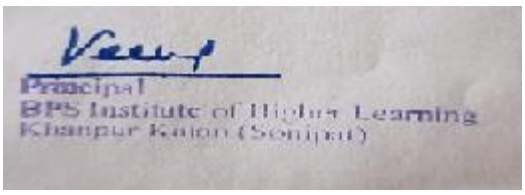
Prenatal and postnatal fitness through diet and exercise.

Course outcomes:

- To Make nutritional, dietary and physical activity recommendations to achieve fitness and well being
- Develop ability to evaluate fitness and wellbeing

REFERENCES:

1. Mahan , L.K & Ecott – stump S. (2000) ; Krauses Food nutrition and diet Therapy, 10th Edition , W.B.Saunders Ltd.
2. Sizer, F. & Whitnet E. (2000): Nutrition – Concept &Contraversies, 8th edition , Wadsworth Thomon Publishing Co.
3. Whitney . E.N & Rolfes , S.R.(1999): Understanding Nutrition , 8th Edition , West /, Wadsworth An International Thomsan Publishing Co.
4. 4.Ira Wolisky (Ed)(1998): Nutrition in Exercise and Sports, 3rd edition , CRC Press
5. 5.Parkizkova , J. nutrition , Physical activity and Health in early life Ed. Wolinsky , I., CRC Press.
6. 6.Shills , M.E., Olson , J.A ., Shike , N. and Ross , A.C.(Ed) (1999): Modern nutrition in Health and Disease , 9th edition , Williams & Willkins.
7. McArdle , W. Katch , F. and Katch, V.(1996) Exercise Physiology, Energy nutrition and Human Performance , 4th Edition , Williams and Willkins , Philadelphia.



COMMUNITY NUTRITION **SEM IV**
Credits : T 3 P 2
Periods/week : 10
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objective:

- To understand the problems of community nutrition at different levels.
- Orient the students with all the important state – of –art methodology applied in nutrition assessment and surveillance of human groups.

UNIT I

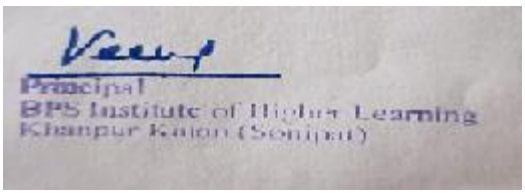
- Nutrition surveillance and planning
- Assessment of Nutritional status of the Community

  Clinical,

  Biochemical,

  Anthroponetric measurement

  And dietary surveys.



UNIT II

National and International agencies in uplifting the nutritional status – introduction to nutritional program
Relationship of health and nutrition
Role played by community dietician in various nutritional programs • role of dietician in community .
Introduction,mission,vision,objectivesofNIN,,WHO,NIPCCID,CARE, UNICEF, ICAR, ICMR

UNIT III

Community Nutrition and Programme Planning

- Introduction, definition of community nutrition, Identification of problem, nutritional assessment, analysis of causes, resources, constraints selection of interventions setting a strategy, implementations, evaluation of the programme

UNIT IV

- Nutrition Education: Methods, Planning and execution ,Evaluation and follow up
- National Nutrition Policy.
- Food security
- Food safety

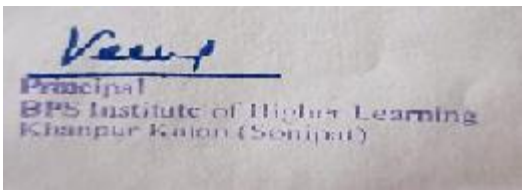
Course outcomes: the students will be able :

- To familiar with various programmes which can be undertaken to prevent and control nutritional problems at regional and national levels.
- Be able to plan, implement, monitor and evaluate nutritional programmes.

PRACTICAL

1. Designing and preparation of nutrition education teaching aids for the community.
2. Assess your own nutritional status.
3. To develop the nutritional value added recipes

REFERENCES:



1. Human nutrition –MC Durff , Maxine
2. Applied Nutrition- Rajalakshmi R.
3. Biology of nutrition- Elements 1972 Platinum Press
4. Text book of Human Nutrition : Bamji M.S., Pralhad Rao, N and Vinodini Reddy (Ed) Oxford and IBH publishing Co. Pvt. Ltd. New Delhi.
5. *Mal-Nutrition & the Eyes Donala Sterari Mclaren Academic Press, New York & London.*
6. Hand book of diet therapy –Dorothea , Turner.
7. Human Nutrition & dieteties – Davidson .S. Passmore, R. Brock – J.F.&TURSWELL a.s.
8. Clinical Dietetices &Nutrition –Antia, F.P.
9. Modern Nutrition in Health & disease by Goodhearth R.S. Shills.
10. Recommended dietary allowance for indian - I.C.M.R.1980
11. Nutrition & Development -Winick 1973, Univ. of Calombia.
12. Food & Nutrition - Krause 1972, Saunders.

NUTRITION IN SPECIAL CONDITIONS **SEM IV**
Credits : T 3 P 1
Periods/week : 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10

Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

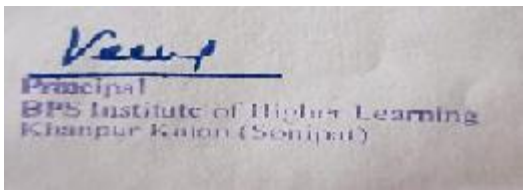
Course objectives:

Understand the physiology, metabolism, strategies for nutrition rehabilitation management and nutrition concern arising out of special situations

UNIT I

Chronic alcoholism: effect on digestion and absorption,alcohol nutrient interaction and dietary management

Nutrition in special physiological conditions: pregnancy,lactation.



UNIT II

Nutrition management in emergencies and disaster (flood and famine etc)
Immune disorder- AIDS, nutrition and immunity
Inborn errors of metabolism: Alkaptonuria, Galactosemia, Phenylketonuria

UNIT III

Therapeutic modification of normal diet and psychological aspects
Mode of feeding
Enteral feeding: indication for use and composition of enteral feeds

UNIT IV

Parenteral feeding: indications for use and composition, advantages and complication
Nutritional concept in alternative medical sciences like Ayruveda, naturopathy etc.

Course objectives: the students will be able to:

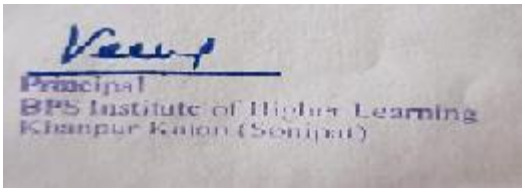
- Familiarize with various natural and manmade emergencies and disaster having an impact on nutritional and health status.
- Be familiar with the special nutrition support techniques and feeding formulations

PRACTICAL

- Planning, preparation of diets for various conditions as explained in theory syllabus
- Planning, preparation Ready to eat food in disasters.

REFERENCES:

1. Text book of Human Nutrition : Bamji M.S., Pralhad Rao, N and vinodint Reddy (Ed) Oxford and IBH publishing Co. Pvt. Ltd. New Delhi.
2. Human Nutrition & dieteties – Davidson .S. Passmore, R. Brock – J.F.&TURSWELL a.s.
3. Clinical Dietetices &Nutrition –Antia, F.P.
4. Recommended dietary allowance for indian - I.C.M.R.1980
5. Nutrition & Development -Winick 1973, Univ. of Calombia.
6. Food & Nutrition - Krause 1972, Saunders.
7. Goyet, Fish. V: Seaman, J. and Geijer, U. (1978) : The Mangement of Nutritional Emergencies in Large Populations, World Health Organisation, Geneva.
8. Refugee Nutrition Information System (RNIS): News letters UN ACC/ SCN Sub- committee on Nutrition.
9. Field Exchange, Newsletters by Emergency Nutrition Network, Dept. of Community Health and General Practice, Irreland.
10. SCN News, Newsletters by UN ACC/ SCN Sub-Committee on Nutrition.



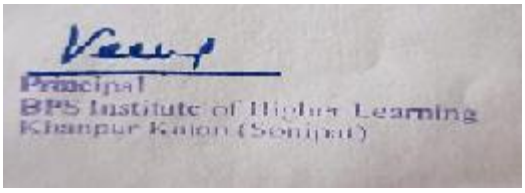
FOOD PRODUCT DEVELOPMENT SEM.IV

Credits: T 3 P 1
Periods/week: 7
Total Marks**: 100+50**
External—80+20
Internal--- 40+10
Total nine questions will be set

- *Question no. 1 will be compulsory consisting of 5 short type questions covering each unit*
- *The remaining eight questions will be set from unit I-IV, two questions from each unit.*
- *The candidate will require to attempt five questions. Question number I will be compulsory, remaining four questions will be attempted by selecting one question from each unit.*

Course objectives:

- Enable the students to understand the function and nature of packaging
- To understand the alteration of structure and function in various organ and system in diseases condition.



UNIT-I

Product development and Evaluation – Need for product development, how to develop a new Product, new products and ingredients, functional foods, Importance of Food Standards: Quality control and assurance. Food standard, laws and regulations to ensure safety of food.

UNIT II

Shelf life of Food Products : Methods to check shelf life, factors affecting shelf life.

Packaging of Food Products – Importance, Material used for food packaging and labelling

UNIT-III

Subjective Evaluation – Meaning

(a) Role of sensory organs and attributes in subjective evaluation of food product quality

(b) Sensory Assessment – Practical requirement for conducting sensory assessment

- Food Science laboratory
- Experimental design
- Panel test
- sample preparation
- Different Assessment Techniques (Preference, difference rating, numeric scoring, hydonic scales, composite scoring and descriptive analysis)
- Product Analysis

UNIT IV

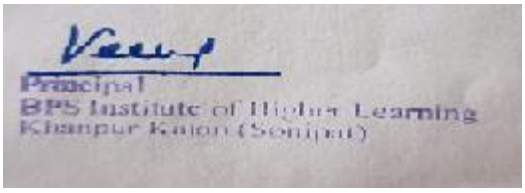
Product Evaluation: Sampling for product evaluation, sample preparation. Tests for raw food ingredients: Proximate principles, nutrient analysis.

Hazards to food products: Microbiological, environmental, natural, toxicants, pesticide residues and food additives.

Course outcomes: the students will be able:

- To develop the potential for food entrepreneurship.
- Provide adequate theoretical background and understanding about sensory evaluation of food.

PRACTICAL



1. Market and consumer survey to identify new products
2. Product development from different food groups and their sensory evaluation by different methods.
3. Observation of working of any food production unit for minimum 5-7 days

Reference:

1. Food Science experiments and applications – Mohini Sethi, CBS Publishers & Distributors
2 A guide to calculating shelf life of food products www.nzfs.govt. hz/processed – food – retail – sale/shelf- life/ shelf life 1-2
3 Sacharow & Griffin, Food Packing – AVI Publications.
4 Stanley & Sacharow Food Packaging
5 Bhatia. S.C. Canning &Preservation of Fruits & Vegetables – New Delhi, India
6 Amerine, M.A. Pangborn, R.M. Roessler, E.B (1965) Principles of Sensory Evaluation. Academic Press, New York
7 BIS 6273 (1972) Guide for Sensory Evaluation of Foods optimum Requirement Part –I Bureau, of Indian Standards, Manate Bhavan, New Delhi
8 Fuller, G.W. (1994) New Food Product Development: From Concept of Market Place CRC Press, New York