

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. NUTRITION & DIETETICS

(Choice Based Credit System)

(with effect from the academic year 2021-2022 onwards)

Se m. (1)	Pt. I/II III/ IV/ V (2)	Sub No. (3)	Subject Status (4)	Subject Title (5)	Con - tact Hrs. / Wee k (6)	L Hr s./ we ek (7)	T Hr s./ we ek (8)	P Hrs / we ek (9)	C re - dit s (10)
I	I	1	Language	Tamil/Other Language	6	6	0	0	4
	II	2	Language	Communicative English	6	6	0	0	4
	III	3	Core -1	Food Science	4	4	0	0	4
	III	4	Major Practical - I	Food Science	2	0	0	2	2
	III	5	Add on Major (Mandatory)	Professional English for life sciences-I	4	4			4
	III	6	Allied - I	Human Development	4	4	0	0	4
	III	7	Allied Practical - I	Human Development	2	0	0	2	2
	IV	8	Common	Environmental Studies	2	2	0	0	2

	Subtotal				30				26
II	I	9	Language	Tamil/Other Language	6	6	0	0	4
	II	10	Language	English	6	6	0	0	4
	III	11	Core-3	Principles of Nutrition	4	4	0	0	4
	III	12	Major Practical - II	Principles of Nutrition	2	0	0	2	2
	III	13	Add on Major (mandatory)	Processional English for life sciences-II	4	4	0	0	4
	III	14	Allied - II	Human Physiology	4	4	0	0	4
	III	15	Allied Practical - II	Human Physiology	2	0	0	2	2
	IV	16	Common	Value Based Education / r%fxOf;fq;fSk; gz;ghl;L tpOkpaq;fSk; / Social Harmony	2	2	0	0	2
				Subtotal	30			26	

1. Objectives

- ★ To impart theoretical and practical skills in nutrition and dietetics
- ★ To enable the students to have a thorough understanding and knowledge of nutrition and dietetics
- ★ To study about nutrients in all our food products
- ★ To facilitate the students of B.Sc Nutrition & Dietetics to join PG courses which in turn offer them job opportunities and research pursuits.
- ★ To apply the skills and knowledge gained through the subject to real life situations and face competitive examinations with confidence at National level.

2. Eligibility for Admission

The minimum eligibility conditions for admission to the **B.Sc Nutrition & Dietetics** program are given below.

The candidates for admission into the first semester of the **B.Sc Nutrition & Dietetics** course will be required to have qualified the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other Examinations accepted by the syndicate of the Manonmaniam Sundaranar University as equivalent there to in Science subject.

3. Duration of the Course

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). The semester contains 90 working days.

4. Elective Subject

One among the two given subjects will be selected.

5. Extension Program for the Department

Apart from the curriculum, to enrich the skill development of the students following courses in their premises are conducted.

- Effective Communication
- Personality development
- Youth development.

6. Internal Assessment

There is a separate passing minimum for the external and overall components.

Distribution of marks between External and Internal Assessment is

- ★ For Theory 75 : 25
- ★ For Practical 50 : 50

Pass minimum of 40% for external and overall components.

Internal Marks for **Theory** shall be allotted in the following

The average of the best two from three compulsory tests. Each test is of one hour duration	20 Marks
Assignment	05 Marks
TOTAL	25 Marks

Distribution of marks between External and Internal Assessment
for skill based elective - 75: 25

The average of the best two from three compulsory tests. Each test is of one hour duration	20 Marks
Assignment	05 Marks
TOTAL	25 Marks

Internal Marks for **Practical** shall be allotted in the following manner

Experimental Work	25 Marks
Regularity	25 Marks
TOTAL	50 Marks

7. Grading System

The performance of the students is indicated by the seven point scale grading system as per the UGC norms given below.

Grade	Grade Point	Percentage of Marks	Performance
O	9.5 and above	95 – 100	Outstanding
E	8.5 and above	85 – 94	Excellent
D	7.5 and above	75 – 84	Distinction
A	6.0 and above	60 – 74	Very Good
B	5.0 and above	50 – 59	Good
C	4.0 and above	40 – 49	Average
RA	0	Upto 39	Re-Appear

The overall performance level of the candidates will be assessed by the following formulae :

Marks x Credits

$$\frac{\sum \text{Marks} \times \text{Credits}}{\sum \text{Credits}}$$

Cumulative weighted average of marks =

$$\frac{\sum \text{Credits} \times \text{Grade Points}}{\sum \text{Credits}}$$

Cumulative weighted average Grade Points

8. Question Pattern

Grade Point x Credits

=

□□

□

□ Credits

Section	Type of Question	No. of Question	Marks
Part A	Objective Type Questions (Two questions from each unit)	5 x 2 = 10	10 x 1 = 10
Part B	Internal Choice Questions (One question from each unit)	5 x 1 = 5	5 x 5 = 25
Part C	Internal Choice Questions (One question from each unit)	5 x 1 = 5	5 x 8 = 40
	TOTAL		75 marks

FOOD SCIENCE

Objectives

1. To obtain knowledge of different food groups and their nutritional value
2. To gain experience in the preparation of foods

Unit - I

Introduction to foods

- a) Definition - food, food science, food additives, food fortification, photochemical, food safety and regulations, antioxidants
- b) Nutrients present in foods
- c) Nutritional classification of foods
- d) Need for grouping foods and Basic food groups - basic four and basic five
- e) Malnutrition- Under nutrition, over nutrition, Balanced diet, Hunger Hollow Hunger, Hidden Hunger, Appetite, Satiety, Health, Meal, Menu.

Unit - II

Food preparation techniques

- a) Preliminary techniques
- b) Different methods of cooking and their influence on nutrient retention
- c) Cooking: Objectives, merits and demerits of cooking

Unit - III

Cereals, Pulses, Nuts and Oilseeds

- a) Cereals - rice, wheat - structure, milling, parboiling, by products, nutritive value and changes in nutritive value during cooking, role in cookery
- b) Pulses - nutritive value, milling, germination, role in cookery
- c) Nuts and Oilseeds - Nutritive value and its importance in the diet

Unit - IV

Fruits, Vegetables, Beverages, Spices and Condiments

a) Fruits - classification based on pigments, ripening of fruits, serving of fruits, nutritive value

b) Vegetables - Classification according to structure, selection, loss of nutrients during cooking, effect of cooking on pigments, nutritive value, effect of heat, acid and alkali, role in cookery

c) Beverages - Classification and their role in the diet

d) Spices and Condiments - Uses and abuses

Unit - V

Animal foods

a) Milk and milk products - nutritive value, types of milk, role of milk and milk products in cookery

b) Flesh Foods - classification, nutritive value - methods of cooking.

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.

c) Egg - Structure, composition, testing the quality, role in cookery

REFERENCES

1. Dr. M. Swaminathan, Advanced Text - Book on Food & Nutrition, Bappco, Bangalore 1985
2. N.Shakuntala Manay , M.Shadaksharaswamy, Foods Facts and principles, New age International (P) Ltd., Publishers Second Edition 2001
3. Seema Yadav, Basic Principles of Nutrition, Anmol Publications PVT Ltd., First Edition 1997
4. B.Srilakshmi .,Food science, New age International (P) Ltd.,2001
5. Vijay Kaushik, Food science and nutrition, Mangal Deep Publications, 2000
6. MeeraVashist, Introduction to Food, Nutrition and Food processing, Anmol Publications PVT. Ltd., 1998

7. S.R. Sharma Vijay Kaushik, Food Nutrition and Cookery, Anmol Publications PVT.Ltd, 1994

MSU/2021-22/UG-Colleges/Part-III (B.Sc. Nutrition & Dietetics) Semester-I /

Major Practical - I

FOOD SCIENCE

- a) Preparation of cereals
- b) Preparation of pulses
- c) Preparation of with fruits
- d) Preparation of vegetables
- e) Preparation of dishes with meat, fish and poultry
- f) Preparation with egg
- g) Preparation with milk
- h) Preparation of beverages

HUMAN DEVELOPMENT

OBJECTIVES

To enable students

1. An understanding of all round development of the individual from infancy to adulthood
2. Understand the philosophy and aims of preschool education and its value to children, parents and community
3. Gain practical experience by observation and participation in the pre-school

Unit – 1

FUNDAMENTALS OF GROWTH AND DEVELOPMENT

- a) The principles of Growth and development
- b) Factors that influence the development
- c) Methods of child study with special emphasis on case study, observation, interview, rating scale and experimental methods

Unit - 2

PERIOD OF INFANCY

- a) Appearance, size and proportion of new born
- b) Physical care and daily routine, feeding - natural and artificial
- c) Bathing, clothing and sleeping
- d) Health and hygiene
- e) Behavioural patterns

Unit – 3

EARLY AND LATE CHILDHOOD PERIOD

- a) Physical and motor growth
- b) Language and intellectual development
- c) Emotional and social development
- d) Needs and interest of the school child
- e) Discipline – Types.
- f) Habits and Habit formation

Unit - 4

ADOLESCENCE

- a) Physical and psychological changes during adolescence
- b) Needs, interests, problems of the adolescents
- c) Personality development of adolescents
- d) The influence of the peer group
- e) Delinquency in children

Unit - 5

PERIOD OF SENESCENCE

- a) Age related changes
- b) Theories of ageing
- c) Modulating process of ageing
- d) Physical and Physiological problems
- e) Family attitudes towards the aged

REFERENCES

1. Breakenridge, M.E & Vincent , E . Lee - Child Development, W.B.Saunders & Co.,1956
2. Hurlock , E.B. Child Development McGraw Hill Co., New York 1950
3. Breakenridge : Marian. E.Murphy: Margaret Neatitt - Growth and Development of the young child W.D.Saunders & Co.,Phildelphia : 1958
4. Read, K.H. The nursery school,W.B.Saunders & Co.,1955
5. Crow and Cros - Adolescent Development and Adjustment , McGraw Hill Book Co.,1956
6. Malm and Jamison - Adolescent, McGraw Hill Book Co., 1952
7. Burgess, E.W. The Family American Book Co., New York 1953
8. Foster, Roberts - Marriage Family relationship, Macmillan Co., 1952
9. Skindmore, Rex.A. Cannon, Arthur, S. Building your marriage
10. Muralidharan R. (Edited) - System Preschool education in India. IAPE, New Delhi .1972
11. Journals Childhood Education - Journal of the Association for childhood.

Allied Practical – 1

HUMAN DEVELOPMENT

PRACTICALS

1. Overall observation of:
 - a. Physical setup of preschool
 - b. Equipment
 - c. Pupil- Teacher ratio
 - d. Daily programme
2. Detailed observation and case history of one child
3. Observation of preschool children to note
 - a. Physical Development
 - b. Language Development- pronunciation and speech
 - c. Social development- contact with peer group, movements, sharing capacity
 - d. Intellectual Development- learning skill and memory capacity
 - e. Emotional Development
4. Having experience in planning and carrying out play activities, science experiments, story- telling and to making.
5. Preparing snacks for children
6. Maintaining a record of observation of children and home visits.

SEMESTER - II

PRINCIPLES OF NUTRITION

Objectives:

1. To understand the role of nutrition in the maintenance of good health
2. To study nutritional deficiencies and their prevention

UNIT - I

BASIC CONCEPTS OF NUTRITION

a) Definition - Nutrition, Nutrients, Adequate Optimum and good nutrition, signs of malnutrition.

b) Recommended dietary allowances- Definition. General principles of Deriving RDA. Factors affecting RDA, uses of RDA.

Balanced diet

UNIT - II

CARBOHYDRATES

- a) Definition, Composition, Nutritional classification.
- b) Digestion, absorption, metabolism, functions, sources and requirements
- c) Regulation of Blood Sugar level.

UNIT - III

PROTEIN

- a) Definition, composition, Nutritional Classifications,
- b) digestion, absorption, EAA, metabolism, functions, sources, requirements and deficiency - Kwashiorkor, Marasmus
- c) Functions of aminoacids.

FATS (Lipids)

- a) Definition, composition, Nutritional Classification
- b) Digestion, absorption, metabolism, functions, PUFA, Sources and effects of deficiency
- c) Essential fatty acids - Definition. Functions

UNIT -IV

MICRONUTRIENTS

- a) Vitamins: History, absorption, functions, requirements, effects of deficiency
 - Fat soluble vitamins - A, D, E and K
 - Water soluble vitamins - C and B complex vitamins
- b) Major Minerals - Calcium, Phosphorous, Sodium, Potassium, Iron
Functions, sources, requirements and effects of deficiency of minerals
- c) Trace Elements - Functions, sources, requirements and effects of deficiency
 - Copper, Zinc, Iodine, fluorine, selenium

UNIT - V

ENERGY

- a) Definition, energy needs of the body, BMR, factors affecting BMR,
- b) Physical activity - Factorial method, Energy requirement and sources.

- c) Determination of energy value - Bomb calorimetric method, determination of energy requirements - Direct calorimetric method

REFERENCES

1. Dr.M.Swaminathan, Advanced Text - Book on Food and Nutrition, Bappco 1985

2. N.ShakuntalaManay, M. Shadaksharaswamy, Foods Facts and Principles, New Age International (P) Ltd. Publishers, Second Edition, 2001

3. Seema Yadav, Basic Principles of Nutrition, Anmol Publication Pvt.Ltd. First Edition ,1997

4. Robinson, C.H. and Lawler, R.M. Normal and Therapeutic Nutrition, Maxmillan Publication & Co., New York, 1994, 17th edition

5. Srilakshmi ,B.,Dietetics, New Age International Private Ltd.,New Delhi 1995
6. Mahtab, S. Bamji , Pralhab Rao,R and Vinodhini,Text Book of Human Nutrition, Oxford and IBH Publishing Co.Pvt.Ltd.,New Delhi

MSU/2021-22/UG-Colleges/Part-III (B.Sc. Nutrition & Dietetics) Semester II / Major Practical - 2

PRINCIPLES OF NUTRITION

1. Formation of spot test
2. Identification of deficiencies through spot test
3. Qualitative test for Sugars
4. Qualitative test for proteins
5. Qualitative test for Minerals

6. Qualitative estimation of Vitamin C in Greens
7. Qualitative estimation of Vitamin C in Lime Juice
8. Quantitative estimation of Vitamin C in Curds
9. Quantitative estimation of reducing sugar in fruit juices
10. Quantitative estimation of reducing sugar in honey
11. Quantitative estimation of Calcium
12. Quantitative estimation of Phosphorous

**MSU/2021-22/UG - Colleges/Part –III (B.Sc. Nutrition & Dietetics) Semester-II /
Allied - II**

HUMAN PHYSIOLOGY

Objectives

1. To understand the structure and physiology of various organs in the body
2. To identify the physiological process applicable to human nutrition

Unit - 1

CELL AND TISSUES

Cell structure and functions of:

- a. Epithelial tissues
- b. Connective tissues
- c. Muscular tissues
- d. Nervous tissues
- e. Blood - Composition, functions, blood volume, plasma proteins, RBC, WBC platelets, haemostasis, coagulation, thrombosis, blood groups - RH factors- Blood coagulations
- f. Immunity – definition, types of immunity

Unit – 2

NERVOUS SYSTEM

- a. Structure and function of brain – General anatomy of nervous system- Cerebrum, thalamus, hypothalamus, mid brain, pons, Medulla oblongata and cerebellum
- b. Structure and function Spinal Cord - Ascending and descending tract, Sympathetic and Parasympathetic nervous system
- c. structure of eye, mechanism of vision
- d. structure of ear – mechanism of hearing
- e. sensation of taste, sensation of smell

Unit - 3

RESPIRATORY SYSTEM AND CIRCULATORY SYSTEM

- a. Respiratory System: Structure and mechanism
- b. Heart - Anatomy and physiology, cardiac output, blood pressure, radial pulse
- c. Blood vessels - structure of artery, vein, capillaries, cardiac cycle, blood circulation

Unit - 4

DIGESTIVE SYSTEM AND EXCRETORY SYSTEM

- a. Anatomy, process of digestion- digestive juices, saliva, gastric juice, pancreatic juice, bile & intestinal juice
- b. Liver and its functions
- c. Physiology of kidney - Nephron, Structure and function
- d. Formation of urine - composition of urine, micturition

Unit – 5

ENDOCRINE GLANDS AND REPRODUCTIVE SYSTEM

- a. Structure and functions of Thyroid, Pituitary, Parathyroid
- b. Structure and functions of adrenals, pancreas and sex gland
- c. General anatomy of male reproductive system
- d. General anatomy of female reproductive system - Menstrual cycle, Fertilization, Pregnancy, Physiology of Lactation

REFERENCES

1. Best and Taylor, 1971 4th edition, The Living Body, Chapman & Hall Ltd., London
2. Guyton, A.G. 4th Edition, 1971. Text Book of Medical Physiology, W.B.Saunders Co.,
3. Mitchell, 1985, 5th edition General Physiology Mc.Graw Hill
4. D'amount 1984, Basic Physiology, Oxford & IBH Publishing Co.,
5. Best C.H. Taylor, B.B.3rd edition. The Human Body: its Anatomy & Physiology, Holt, Rineshart & Winston Inc.
6. Chatterjee. C.C; 2002, Human Physiology, Medical Allied Agency, Kolkata
7. Chatterjee. C.C; 2000, Human Physiology, Medical Allied Agency, Kolkata

MSU/2021-22/UG - Colleges/Part-III (B.Sc. Nutrition & Dietetics) Semester I /

Allied Practical – 1I

HUMAN PHYSIOLOGY

1. Histology of epithelial, muscular, connective tissue, bone, cartilage, nerve tissues, artery, vein and capillaries.
2. Estimation of Haemoglobin
3. Determination of blood group,
4. Determination of bleeding time and coagulation time
5. Demonstration of WBC / RBC count
6. Recording of Blood Pressure and pulse rate before and after exercise