MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. FOOD SCIENCE & NUTRITION

(Choice Based Credit System)

(With effect from the academic year 2020-2021 onwards)

Sem. (1)	Pt. I/II/ III/ IV/ V (2)	Sub No. (3)	Subject Status (4)	Subject Title (5)	Con - tact Hrs./ Week (6)	L Hrs./ week (7)	T Hrs./ week (8)	P Hrs./ week (9)	C Cre - dits (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	Core -2	Public Health and Community Nutrition- I	4	4	0	0	4
	III	5	Major Practical - I	Food Science	2	0	0	2	2
	V	9	Add on Major (Mandatory)	Professional English for life Sciences - I	4	4	0	0	4
	III	6	Allied - I	Human Physiology - I	3	3	0	0	3
	III	7	Allied Practical - I	Human Physiology - I	2	0	0	2	2
	IV	8	Common	Environmental Studies	2	2	0	0	2
	Subtotal				**33**				**29**
II	I	10	Language	Tamil/Other Language	6	6	0	0	4
	II	11	Language	English	6	6	0	0	4
	III	12	Core-3	Human Development	4	4	0	0	4
	III	13	Core -4	Public Health and Community Nutrition - II	4	4	0	0	4
	III	14	Major Practical - II	Human Development	2	0	0	2	2
	V	15	Add on Major (Mandatory)	Professional English for life Sciences - II	4	4	0	0	4
	III	16	Allied - II	Human Physiology - II	3	3	0	0	3
	III	17	Allied Practical - II	Human Physiology - II	2	0	0	2	2
	IV	18	Common	Value Based Education / சமூகஒழுக்கங்களும் பண்பாட்டு விழுமியங்களும் / Social Harmony	2	2	0	0	2
				Subtotal	**33**				**29**

L: Lecture **T**:Tutorials **P:**Practical's

I. Objectives

1. The curriculum offers robust academic and experiential opportunities across the health spectrum to address the health of individuals and populations from prevention to palliation.
2. To divulge theoretical understanding and practical skills that reinforces the various arenas of Food Science andNutrition.
3. The course is aimed to enable students to gain knowledge about interaction between food, body and health under normal and specialcircumstances.
4. This course will enable students to use current information technologies to locate and apply evidence-based guidelines and protocols and get imparted with critical thinking to take leadership roles in fields of health, dietetics, special nutritional needs and nutritional counselling. Currently food industry is shifting its focus from taste to nutrition.
5. To expedite the undergraduates of Food Science and Nutrition to pursue higher studies which in turn offer career opportunities and researchquests.
6. To apply the skills and knowledge gained through the subject to real life situations and face competitive examinations with self-confidence at Nationallevel.

II. Eligibility forAdmission

The minimum eligibility conditions for admission to the **B.Sc Food Science and Nutrition** program are given below.

The candidates for admission into the first semester of the **B.Sc Food Science and Nutrition** 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 Sciencesubject.

III. 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.

IV. ElectiveSubject

One among the two given subjects will be selected.

V. Extension Program for theDepartment

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.

VI. 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**

VII. GradingSystem

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	Up to 39	Re-Appear

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

$$\text{Cumulative weighted average of marks} = \frac{\sum \text{Marks} \times \text{Credits}}{\sum \text{Credits}}$$

$$\text{Cumulative weighted average Grade Points} = \frac{\sum \text{Grade Point} \times \text{Credits}}{\sum \text{Credits}}$$

VIII. QuestionPattern

Section	Type of Question	No. of Question	Marks
Part A	Objective Type Questions (Two questions from each unit)	5 x 2 = 10	10 x1= 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**

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) / Semester – I
Core -1

FOOD SCIENCE

Objectives:

- To obtain knowledge of different food groups and their nutritionalvalue
- To gain experience in the preparation of foods

Unit I

Introduction to Foods:

a) Definition –food, food science, food additives, food technology, food fortification, phytochemicals, food safety and regulations,antioxidants
b) Nutrients present infoods
c) Nutritional classification offoods
d) Need for grouping foods and Basic food groups-basic four and basicfive

Unit II

Food preparation techniques

a) Preliminarytechniques
b) Different methods of cooking and their influence on nutrientretention

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 incookery
b) Pulses – nutritive value, milling, germination, role incookery
c) Nuts and Oilseeds – Nutritive value and its importance in thediet

Unit IV

Fruits, vegetables, beverages, spices and condiments

a) Fruits – classification based on pigments, ripening of fruits, serving of fruits, nutritivevalue
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 incookery
c) Beverages – Classification and their role in thediet
d) Spices and condiments – uses and abuses

Unit V

AnimalFoods:

a) Milk and milk products – nutritive value, types of milk, role of milk and milk products in cookery
b) Flesh Foods: Meat, Fish and Poultry –classification, nutritive value – methods of cooking
c) Egg: Structure, composition, testing the quality, role incookery

References:

1. Dr. M. Swaminathan., Advanced Text – Book on Food & Nutrition, Bappco, Bangalore1985
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 Publication 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. Meera Vashisht, 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/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) /

Semester - I / Core - 2

PUBLIC HEALTH AND COMMUNITY NUTRITION - I

Objectives:

- To understand the basic concepts, principles, components and importance ofhealth.
- To obtain knowledge about various diseases and controlmeasures
- To understand the ongoing community nutritionprogrammes

UnitI

Introduction to Health and Diseases

a) Definition- Health, public health and communityhealth
b) Determinants of health, concepts in community health-biomedical, ecological, psychological andholistic
c) Concept ofdisease
d) Classification ofdiseases

Unit II

Hygiene

Hygiene – Meaning; need for personal hygiene with special reference to hair, hands, teeth, nails, nose, face, throat and other parts of the body – its significance in food handling and service.

UnitIII

Food Poisoning

Different types- Clinical symptoms, causative factors and prevention - salmonella, staphylococcus, clostridium, use of disinfectants

Unit IV

Infection

a) Infection - Sources, mode of transmission, Prevention andcontrol.

b) Immunity – Active,Passive.

c) Common Infectious organisms – Helminthes andInsects

UnitV

National and International Organizations

ICDS, Noon meal programme, ICMR, ICAR, CFTRI, NIN, WHO, FAO, UNICEF

REFERENCES:

1. Park J.E. and Park K.K. "Preventive and Social medicine", Bannar, Sidas Bhanot and company Ltd, India1975.
2. Joshua A.K, "Microbiology", India Printing works.
3. Frazier, W.C, "Food Microbiology" Tata Mc Grew Hill book Company, Bombay 1992.
4. Rao and Bhat, 1997, Food Safety, Bappco publishers,Bangalore.
5. Bamji, 1997, Text book of Human Nutrition Oxford publishers, NewDelhi.

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) Semester - I / Major Practical - I

FOOD SCIENCE

a) Preparation of cereals
b) Preparation ofpulses
c) Preparation withfruits
d) Preparation ofvegetables
e) Preparation of dishes with meat, fish andpoultry
f) Preparation withegg.
g) Preparation withmilk.
h) Preparation ofbeverages

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) Semester - I /
Add on Major (Mandatory)

PROFESSIONAL ENGLISH FOR LIFE SCIENCES - I

OBJECTIVES:

To develop the language skills of students by offering adequate practice in professional contexts.
To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
To focus on developing students' knowledge of domain specific registers and the required language skills.
To develop strategic competence that will help in efficient communication
To sharpen students' critical thinking skills and make students culturally aware of the target situation.

LEARNING OUTCOMES:
Recognise their own ability to improve their own competence in using the language
Use language for speaking with confidence in an intelligible and acceptable manner
Understand the importance of reading for life
Read independently unfamiliar texts with comprehension
Understand the importance of writing in academic life
Write simple sentences without committing error of spelling or grammar
(Outcomes based on guidelines in UGC LOCF – Generic Elective)
NB: All four skills are taught based on texts/passages.

UNIT 1: COMMUNICATION

Listening: Listening to audio text and answering questions
Listening to Instructions
Speaking: Pair work and small group work.
Reading: Comprehension passages –Differentiate between facts and opinion
Writing: Developing a story with pictures.
Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 2: DESCRIPTION
Listening: Listening to process description.-Drawing a flow chart.
Speaking: Role play (formal context)
Reading: Skimming/Scanning-
Reading passages on products, equipment and gadgets.
Writing: Process Description –Compare and Contrast
Paragraph-Sentence Definition and Extended definition-
Free Writing.
Vocabulary: Register specific -Incorporated into the LSRW tasks.

UNIT 3: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields (Subject specific)
Speaking: Brainstorming. (Mind mapping).
Small group discussions (Subject- Specific)
Reading: Longer Reading text.
Writing: Essay Writing (250 words)
Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 4: PRESENTATION SKILLS

Listening: Listening to lectures.
Speaking: Short talks.
Reading: Reading Comprehension passages
Writing: Writing Recommendations
Interpreting Visuals inputs
Vocabulary:Register specific -Incorporated into the LSRW tasks

UNIT 5: CRITICAL THINKING SKILLS

Listening: Listening comprehension- Listening for information.
Speaking: Making presentations (with PPT- practice).
Reading : Comprehension passages –Note making.
Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills)
Writing: Problem and Solution essay– Creative writing –Summary writing
Vocabulary: Register specific - Incorporated into the LSRW tasks

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) / Semester - I
Allied -1

HUMAN PHYSIOLOGY - I

Objectives:

- To understand the structure and physiology of various organs in thebody
- To identify the physiological process applicable to humannutrition

Unit I

Cell and digestive system:

Cell and tissue –cell structure and functions of epithelial, connective, muscular and nervous tissue

Unit II

Digestive System

Anatomy, process of digestion, liver and its functions

Unit III

Circulatorysystem:

a. Blood – Composition, functions, blood groups – RH factors- Blood coagulation
b. Heart – Anatomy and physiology, blood vessels – structure of artery, vein, capillaries, cardiac cycle, blood circulation.

Unit IV

RespiratorySystem

Respiratory System: Structure and mechanism.

Unit V

Excretory System:

Physiology of Kidney – Nephron, structure and function, formation of urine.

Allied Practical - I

HUMAN PHYSIOLOGY - I

1. Histology of epithelial, muscular, connective tissue.
2. Estimation of Haemoglobin
3. Demonstration of RBC count
4. Identification of Blood Pressure

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) Semester II / Core -3

HUMAN DEVELOPMENT

Objectives:

To enable students

- Understand the philosophy and aims of pre-school education and its value to children, parents andcommunity
- Gain practical experience by observation and participation in thepre-school
- Understand the growth development of the child during the period 6-12 years and study his needs during thisperiod
- Gain knowledge of the needs, interest and problems of the adolescent, relation to the family, friends, peers andcommunity

Unit I

Fundamentals of growth and development

a) The principle of Growth anddevelopment.
b) Factors that influence thedevelopment
c) Methods of child study with special emphasis on case study and observationmethods

Unit II

Period of Infancy

a. Appearance, size and proportion of newborn

b. Physical care and daily routine; Feeding –natural and artificial, bathing, clothing and sleeping.

c. Health andHygiene

d. Behaviouralpatterns

Unit III

Early and Late Childhood Period

a. Physical and motorgrowth
b. Language and intellectual development
c. Emotional and socialdevelopment
d. Needs and interest of the schoolchild
   Habits and Habitformation

Unit IV

Adolescence

a. Physical & psychological changes duringadolescence
b. Needs, interests, problems of theadolescents
c. Personality development ofadolescents
d. The influence of the peergroup
e. The value of the healthy relationships between the adolescent, his home andcommunity
f. Delinquency inchildren

Unit V

Period of Senescence

a) Age related changes, theories of ageing, modulating process ofageing
b) Physical and physiological problems, psychology, family attitudes towards theaged

Reference:

1. Breakenridge, M.E. & Vincent, E.Lee – Child Development, W.B. Saunders & CO., 1956.
2. Hurlock, E.B. Child Development Mcgraw Hill Co., New York1950.
3. Breakenridge: Mariaan. 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 York1953.
8. Foster, Roberts – Marriage Family relationships, Macmillan Co.,1952.
9. Skindmore, Rex.A. Cannon, Arthur, S. Building your marriage.
10. Muralidharan R. (Edited) – System Pre-school education in India. IAPE, New Delhi. 1972.
11. Journals: 1 Childhood Education – Journal of the Association forchildhood.

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) Semester II/ Core - 4

PUBLIC HEALTH AND COMMUNITY NUTRITION - II

Objectives:

1. To understand the basic concepts, principles, components and importance of health.
2. To obtain knowledge about various diseases and controlmeasures
3. To understand the ongoing community nutritionprogrammes.
4. Appreciate the national and International contribution towardsnational

Unit I

Common water and Food borne diseases

a) Cholera, dysentery, diarrhoea, typhoid, paratyphoid
Salmonellosis, Listeriosis, Campylobacteriosis, Botulism, *E.Coli*, Hepatitis A- Causes, Symptoms, treatment and preventive measures

Unit II

Methods of assessment of Nutritional status

a) Sampling

b) Direct assessment – Diet survey, anthropometry, clinical and biochemicalestimation.

c) Indirect assessment -Food balance sheet, Agricultural data, Ecological parameter andvital statistics, use of growthchart.

Unit III

Food Adulteration

Definition, common food adulterants, Specifications

Unit IV

Health programmes

a. Immunizationprogramme
b. National Malaria EradicationProgramme
c. Leprosy ControlProgramme
d. Tuberculosis ControlProgramme

Unit V

Nutrition Education

a) Meaning and Scope of Nutritioneducation

b) Methods - Planning, conduct of evaluation of Nutrition educationProgramme

Reference:

1. Park J.E. and Park K.K. "Preventive and Social medicine", Bannar, Sidas Bhanot and company Ltd, India1975.
2. Joshua A.K, "Microbiology", India Printing works.
3. Frazier, W.C, "Food Microbiology" Tata Mc Grew Hill book Company, Bombay 1992.
4. Rao and Bhat, 1997, Food Safety, Bappco publishers,Bangalore.
5. Bamji, 1997, Text book of Human Nutrition Oxford publishers, NewDelhi.

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) Semester II/ Major Practical - II

HUMAN DEVELOPMENT

1. Over all observationof:
    b. Physical setup ofpre-school
    c. Equipment
    d. Pupil – Teacher ratio
    e. Dailyprogramme
2. Detailed observation and case history of onechild
3. Observation of pre-school children tonote
    a. PhysicalDevelopment
    b. Language Development – pronunciation &speech
    c. Social Development - contact with peer group, movements, sharingcapacity
    d. Intellectual Development – learning, skill and memorycapacity
    e. Emotionaldevelopment
4. Having experience in planning and carrying out play activities, science experiments, story-telling and toymaking
5. Preparing snacks forchildren
6. Maintaining a record of observation of children and homevisits

MSU/2020-21/UG-Colleges/Part-III(B.Sc. Food Science & Nutrition) / Semester II /

Allied - II

HUMAN PHYSIOLOGY - II

Objectives:

2. To understand the structure and physiology of various organs in thebody
3. To identify the physiological process applicable to humannutrition

Unit I

Endocrine glands I

Structure and functions of Thyroid, Pituitary, Parathyroid

Unit II

Endocrine glands II

Structure and functions of Adrenals, pancreas and sex glands.

Unit III

Reproductive system

a) General anatomy of male reproductivesystem.

b) General anatomy of female reproductivesystem.

c) Menstrual cycle, Fertilization, Pregnancy, Parturition and physiology oflactation

Unit IV

Nervous system I

Structure and function of brain - cerebrum, thalamus, hypothalamus midbrain, pons, Medulla oblongata, andcerebellum

Unit V

Nervous system II

a) Spinal Cord- Structure andfunctions

b) Ascending and descendingtract

c) Sympathetic and parasympathetic nervoussystem

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. SaundersCo.,
3. Mitchell, 1968 5th edition General Physiology Mc.GrawHill.
4. D'amount, 1969 Basic Physiology, Oxford & IBH PublishingCo.,
5. Best C.H. Taylor, B.B. 3rd edition. The Human Body: Its Anatomy & Physiology, Holt, Rineshart & WinstonInc.
6. Chatterjee. C. C; 2002, Human Physiology, Medical Allied Agency,Kolkata
7. Chatterjee. C. C; 2000, Human Physiology, Medical Allied Agency,Kolkata

MSU/2020-21/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition) Semester– II/ Allied Practical - II

Allied Practical – II

HUMAN PHYSIOLOGY - II

1. Histology of bone, Cartilage, nerve tissue, artery, vein
2. Determination of blood groups
3. Determination of Rh factor
4. Demonstration of WBC Count