

Mahatma Gandhi University

**SYLLABUS FOR
B. Sc CLINICAL NUTRITION AND DIETETICS**

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B. Sc CLINICAL NUTRITION AND DIETETICS

Nutrition plays a primary role in growth, development, health and fitness. Maintaining appropriate nutrition throughout life can prevent, or at least delay the onset of nutrition related diseases. The U.G programme in clinical nutrition and dietetics offers a thorough study of the field of nutrition and dietetics giving special attention to the clinical aspects. An integration of theory, practical, internship and community work aim at equipping the students the necessary proficiencies for a wide variety of carriers.

CARRIER OPTIONS

1. Dietitians in hospitals
2. Diet consultants in hotels industrial canteens etc
3. Nutritionist in food industries
4. Member of teaching faculty in higher education
5. Research assistants/ Associate in institutes undertaking research programmes in nutrition and health
6. Food quality controllers in food processing units.
7. Project officers under different welfare programmes of governmental and non - governmental organizations
8. Project officers in nutrition programmes FAO, WHO, UNICEF
9. Self employment opportunities

ELIGIBILITY

+2 or equivalent with any three of the following science subject, physics, chemistry, biology, home science. Selection will be based on academic excellence

EVALUATION

The evaluation of each course shall contain two parts.

- (i) Internal or In-Semester Assessment (ISA)
- (ii) External or End-Semester Assessment (ESA)

The internal external assessment ratio shall be 1:3

The Internal and External examinations shall be evaluated using direct Grading system based on 5 point scale as given below.

Letter Grade	Performance	Grade point (G)	Grade Range
A	Excellent	4	3.5 to 4.00
B	Very good	3	2.5 to 3.49
C	Good	2	1.5 to 2.49
D	Average	1	0.5 to 1.49
E	Poor	0	0.00 to 0.49

The overall grade for a programme for certification shall be based on CGPA with a point scale give below.

CGPA	Grade
3.80 to 4.00	A+
3.50 to 3.79	A
3.00 to 3.49	B+
2.50 to 2.99	B
2.00 to 2.49	C+
1.50 to 1.99	C
1.00 to 1.49	D

A separate minimum of D grade for internal and external are required for a pass for a course. For a pass in a programme a separate minimum of Grade D is required for all the courses and must score a minimum CGPA of 2.00 or an overall grade C+ and above.

Internal evaluation: is to be done by continuous assessments on the following components.

Components of the internal evaluation and their weights are as below.

(i) Theory

Component	Weight
Attendance	1
Assignment	1
Seminar	1
Two test papers	2

Attendance

% age of attendance	Grade
> 90%	A
Between 85 and 90	B
Between 80 and 85	C
Between 75 and 80	D
< 75	E

- Assignments : Best two assignments are considered per course.
- Seminar/Viva : The student has to take a minimum of 1 seminar per course.
- Class test : A minimum of 2 class tests are to be attended. The grades of best 2 test are to be taken.

Semester I

Course Title	Hours/Week	Credit	Total Credit
English I	5	4	20
Core course I- Human Anatomy and Physiology -I	4	4	
Core course II - Basic Nutrition and Dietetics	4	3	
Core course III - Information Technology and IT tools	4	3	
I Complementary Paper I Chemistry	2	2	
I Complementary Paper I – Practical	2	1	
II Complementary Paper I Zoology	2	2	
II Complementary Paper I – Practical	2	1	

SEMESTER I

CORE COURSE I- HUMAN ANATOMY AND PHYSIOLOGY –I

Total hours of instruction: 54

Hours/week : 4

Credit: 4

Objectives:

To enable the students to-

- Understand the general structure and functions of various systems and organs of the body.
- Understand the abnormal changes in the tissue and organs on several disease states.

Module I

A. Circulatory System

Functions: Blood –functions, composition, blood clotting, blood groups, blood vessels, structure of heart, cardiac cycle, blood circulation. ECG and its significance, blood pressure – pulse, systolic and diastolic. Anaemia, Leukemia, Varicose veins, Angina pectoris.

References:

Wilson, J. K and Waugh, A. (1999) Ross & Wilson- Anatomy and Physiology in health and illness, Pp: 56-110.

Sebastian, M. M (2001) Animal Physiology, Madonna Books, Amalagiri P. O, Kottayam, Pp:140-153.

Chatterjee, C. C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp:122-186, 226-299.

Hole, J .W.(1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp:360-422.

B. Lymphatic System

Functions, formation of Lymph, lymph glands and its functions, Spleen- Structure and function. Oedema and its types.

References

- Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness, Pp130-135
- Sebastian, M. M (2001) Animal Physiology, Madonna Books, Amalagiri P O, Kottayam, Pp:170-172.
- Chatterjee, C. C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp:192-203.
- Hole, J. W. (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp:432-439.

Module II

Digestive System

Digestive organs- Structure and function, glands-liver, pancreas, gall bladder, gastric glands, intestinal glands and salivary glands. Digestive disorders- vomiting, constipation, diarrhoea, abdominal pain, ulcers and piles.

References

- Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness, Pp:280-310.
- Sebastian M M (2001) Animal Physiology, Madonna Books, Amalagiri P O, Kottayam, Pp:49-72.
- Chatterjee C C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp: 427-497.
- Hole J. W, (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp: 304-327.

Module III

Nervous System

Structure of nerve cell, nerve fiber. Classification of nervous system – CNS, PNS , ANS – their functions. Nerve impulses, synapse, reflex action, voluntary action.

References

- Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness, Pp:142-175
- Sebastian, M. M (2001) Animal Physiology, Madonna Books, Amalagiri P O, Kottayam, Pp:239-259.
- Chatterjee, C. C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp:5.1-5.177.
- Hole, J. W (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp: 206-239.

Module IV

Sense Organs

A: Skin

Structure and functions. Disorders of skin – dandruff, dermatitis and burns.

References

- Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness, Pp:13.
- Chatterjee C C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp:1.68-1.78.

B: Eye

Structure and functions. Physiology of vision, defects in vision – myopia and hypermetropia. Common eye diseases – conjunctivitis, trachoma, cataract.

References

Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness, p196-208.

Hole J W, (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp;261-269.

C: Ear

Structure and functions –mechanism of hearing, common ear diseases- deafness, Vertigo, Motion Sickness.

References

Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness, Pp: 192-196.

Hole J W, (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp; 255-261.

D: Nose

Structure and functions. – Olfactory Mechanism.

References

Ross & Wilson- Anatomy and Physiology in health and illness, p207-208.

Sebastian M M (2001) Animal Physiology, Madonna Books, Amalagiri P O, Kottayam, Pp:259-286.

Chatterjee C. C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp:6.6-6.12.

Hole, J. W, (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp; 252.

E: Tongue

Structure and functions– Gustatory Mechanism.

References

Chatterjee, C .C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta. Pp: 6.1-6.5.

Hole, J W, (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa, Pp: 253-254.

Suggested Readings

- Wilson, J. K. and Waugh A (1999) Ross & Wilson- Anatomy and Physiology in health and illness.
- Sebastian, M. M (2001) Animal Physiology, Madonna Books, Amalagiri.
- Chatterjee, C. C (2003) Human Physiology, Medical Allied Agency, 82/1, Mahatma Gandhi Road, Calcutta.
- Hole, J. W (1989), Essentials of Human Anatomy and Physiology, 3rd edition, WCB Publishers, Dubuque, Iowa.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER I

CORE COURSE II – A. BASIC NUTRITION

Total hours of instruction: 54

Credit: 3

Hours per week: 4

Objectives

To enable the students to-

- To understand the relation between nutrition and health.
- To acquire knowledge about the main nutrients and its functions in the body.
- To understand the modifications in nutrient and dietary requirement for various diseases.

Module I

Introduction to nutrition, Definitions: -Food, Nutrition, Health, Nutrients, Nutritional status, optimum and good nutrition, states of nutritional Health:- Under nutrition and over nutrition.

Functions of food, Food as a source of nutrients.

Reference

Mudambi, S.R, Rajagopal, M.V(1990), Fundamentals of Food and Nutrition, Wiley Eastern Ltd, Pp:4-9

Srilakshmi, B(2006), Nutritional Science, 3rd Edition, New Age International (p) Limited, Pp:1-9.

Module II

Visible symptoms of good health, Food guide, How to use food guide, and Basic five food groups.

References

Wardlad, G.M. Insel, P.M (1993), Perspectives in Nutrition, Second edition, Mosby Publishers, Pp: 43-45

Module III

Use of food in body-digestion, absorption, transport and utilization of nutrients in the body.

Reference

Mudambi, S.R, Rajagopal,M.V(1990),Fundamentals of Food and Nutrition, Wiley Eastern Ltd, Pp:4-9

Module IV

Water as a nutrient, functions, sources, requirements, Water balance:-Water intake and loss, Water intoxication and dehydration

Reference

Swaminathan,S(2002), Food and Nutrition Volume I,The Bangalore Printing and Publisghing Co.Ltd, Pp:432-436.

Module V

Carbohydrates: - Composition, Classification, Sources and functions.

References

Robinson, C.H, Lawler M.R, Cheweth W.L; and Gaswick A.E, Normal and Therapeutic Nutrition ,17th edition,Mac Milan Publishers,Pp:64-68.

Module VI

Fat and oils: Composition, Classification, food sources, requirements, functions.

Module VII

Protein: Composition, classification, functions, sources, requirements.

Module VIII

Energy: Unit of energy, Source of energy, B.M.R:- Definitions, factors affecting metabolic rate.

Module IX

Minerals: Functions, sources, requirements, deficiency (very brief) of following minerals: calcium, Iron, Iodine, sodium, potassium

Module X

Vitamins:- Functions, sources, requirements, deficiency (very brief) , fat soluble vitamins A, D, E, K and water soluble vitamins Thiamin, Riboflavin, Niacin, Vitamin C.

Suggested Readings (Basic Nutrition)

- Bamji M.S, Vinodini Reddy (1998), Text Book of Human Nutrition, Oxford and IBH publishing Co. Ltd New Delhi.
- Food and Nutrition (1996), Education planning, Arya publishing House.
- Guthrie H.A, Picciano M.F, (1995), Human Nutrition, Mosby, St. Louies Missionary.
- Joshi V.D (1999), Hand book of Nutrition and dietetics, Vora medical publications.
- Khader V.J, (2003), Foods, Nutrition and Health, Kalyani Publishers.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

CORE COURSE II – B BASIC DIETETICS

Module 1

Role of dietitian: - Hospital and community.

Reference:

Srilakshmi B, Dietetics (2006), New age International publishing Ltd,
327-329.

Module II

Basic concepts of Diet Therapy

Module III

Therapeutic adaptations of normal diet

Reference

Srilakshmi B, Dietetics (2006), New age International publishing Ltd,
Pp: 141,151-158

Module IV

Routine hospital diets - regular diets, clear fluid diet, full fluid diet, soft diet
and tube feeding.

Reference

Robinson C.H., Lawler M..R, Cheweth W.L; and Gaswick A.E, Normal and
Therapeutic Nutrition ,17th edition, Mac Milan Publishers, Pp: 410-415

Module V

Nutrition and diet clinic – patient check up and dietary counseling, n of the
patient and follow up.

Suggested Readings

- Antia P. Clinical Dietetics and Nutrition, 2nd edition, Oxford university press
- Garrow J.S, James W. P.T, Ralph A, (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingstone, London

- Guthrie H. A, Picciano M. F (1995), Human Nutrition, Mosby, St. Louis missionery.
- Sharon M (1994), Complete Nutrition, Avery publishing group. New York.
- Mohan K. L, Krause M.V (2002), 2nd edition Food , nutrition and Diet Therapy, W.S. suders Co, Philadelphia.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER I

CORE COURSE III - INFORMATION TECHNOLOGY AND IT TOOLS

Total hours of instruction: 54

Credit: 3

Hours per week: 4

Objectives:

- It will provide an introduction to Information Technology and IT tools. It makes one to become IT literate.
- It helps to understand and work with Operating systems and Microsoft Office Packages.
- It helps to effectively use the Internet for both information retrieval and data transfer.

Module 1

Computer Fundamentals

Computer Organization, Characteristics of computers, Input Devices, Output Devices, Primary memory and Secondary memory, Hardware and Software, Types of computers, Computer Languages.

Reference

P. K. Sinha and Priti Sinha, Computer Fundamentals, BPB Publications, New Delhi, 3rd edition. 2, 15-19, 97-135, 139-164, 196-220, 362-369.

Module II

Operating Systems

Operating system, Booting, An overview of MS DOS and Microsoft

Windows operating systems

MS DOS – Internal Vs. External DOS commands, Simple Internal commands - file operations, Directory related commands, Simple External commands

MS Windows – Basic Windows elements – Desktop, Start menu, Control Panel (Date/Time, Display, Mouse, Keyboard, Regional Settings). Using essential accessories – Paint, Notepad, Word Pad, and Calculator.

References

P. K. Sinha and Priti Sinha, Computer Fundamentals, BPB Publications, New Delhi, 3rd edition. Pp:237-245,257,258.

Steve S (2003) Microsoft Office for Windows Pearson education, Singapore, Pp: 3-10'

MS DOS 6.2 Quick Reference – Rajiv Mathur

Module III

Internet and E-mail

Computer Networks – LAN, MAN, WAN. Internet requirements, TCP/IP, Internet services, Search Engines, Understanding Internet address, E-mail.

Reference

P. K. Sinha and Priti Sinha, Computer Fundamentals, BPB Publications, New Delhi, 3rd edition. Pp:306-347.

Module IV

Word Processing and Spreadsheet Packages

Microsoft Word – Basic operations, Finding and replacing text, Headers and Footers, Formatting text, creating and printing Merged documents, running Macros, Table operations.

Microsoft Excel – Spreadsheet concepts, Basic operations, Working with Charts, Formatting worksheets, Functions - Mathematical, Logical,

Statistical, Text and Date and Time functions, Goal Seek, Scenarios, Auditing, Important Data menu commands.

Reference

Dinesh Maidasani, MS Office 2000, Firewall Media, Lakshmi publications, New Delhi. Pp:37-92,99-169.

Steve Sagman, Microsoft Office for Windows, Pp:33-3-104,115-192.

Suggested Readings

- Dinesh Maidasani, MS Office 2000, Firewall Media, Lakshmi publications, New Delhi.
- Steve Sagman, Microsoft Office for Windows.
- P. K. Sinha and Priti Sinha, Computer Fundamentals, BPB Publications, New Delhi, 3rd edition.
- Steve S (2003) Microsoft Office for Windows Pearson education, Singapore.
- MS DOS 6.2 Quick Reference – Rajiv Mathur

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

Semester II

Course Title	Hours/Week	Credit	Total Credit
English II	5	4	20
Core course IV- Human Anatomy and Physiology II	4	4	
Core course V – Therapeutic Nutrition	4	3	
Core course VI - Programming Through C Language	4	3	
I Complementary Paper II	2	2	
I Complementary Paper II– Practical	2	1	
II Complementary Paper II	2	2	
II Complementary Paper II – Practical	2	1	

SEMESTER II

CORE COURSE IV – HUMAN ANATOMY AND PHYSIOLOGY II

Total Hours of Instruction: 72

Credit: 4

Hours/Week : 4

Objectives:

To enable the students to-

- Understand the general structure and functions of various systems and organs of the body.
- Understand the abnormal changes in the tissue and organs on several disease states.

Module I

Respiratory system

Organs of respiration – structure and functions, volume and capacity of lungs, mechanism of respiration , cell respiration. Respiratory diseases – T.B, asthma, pleurisy, cough and hiccups.

References

- Hole, J.W (1989) , Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa. – Pp 344-360
- Wilson , K.J. and Waugh , A. (1999) , Ross and Wilson Anatomy and Physiology in health and illness. – Pp 240-257
- Sebastian ,M.M (2001), Animal Physiology , Madonna Books , Amalagiri Kottayam– Pp 117-134

Chatterjee, C.C. (2003), Human Physiology , Vol I & II Medical Allied Agency , 82/1 , Mahatma Gandhi Road , Kolkata – 700009. – Pp 365-425

Module II

Excretory system

Excretory organs – structure and functions. Formation of urine, composition of normal urine, abnormal constituents of urine, significance of urine examination. Diseases – Nephritis, Nephrosis, Renal stone.

References

Hole, J.W (1989) , Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa. – Pp 452-466

Wilson, K.J. and Waugh , A. (1999) , Ross and Wilson Anatomy and Physiology in health and illness. – Pp 338-347

Sebastian,M.M (2001), Animal Physiology , Madonna Books , Amalagiri Kottayam– Pp 178-195

Sarada Subramanyam. S, Text book of Human Physiology, S Chand and Company Ltd, New Delhi, p-411-445.

Chatterjee, C.C. (2003), Human Physiology , Vol I & II Medical Allied Agency, 82/1 , Mahatma Gandhi Road , Kolkata Pp. 1-1-156

Module III

Endocrine system

Endocrine glands – structure and functions

a) Pituitary b) Thyroid c) Parathyroid d) Adrenal e) Pancreas

Disorders of over and under secretions.

References

- Hole, J.W (1989), Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa. – Pp 278-294
- Wilson, K.J. and Waugh , A. (1999) , Ross and Wilson Anatomy and Physiology in health and illness. – Pp 216-235
- Sebastian ,M.M (2001), Animal Physiology , Madonna Books, Amalagiri Kottayam– Pp 289-301
- Chatterjee II , C.C. (2003), Human Physiology , Vol I & II Medical Allied Agency , 82/1 , Mahatma Gandhi Road , Kolkata – 700009. 4-13-4-176

Module IV

Reproductive system

Male reproductive organs – structure, and functions. Female reproductive organs- structure and functions, reproductive hormones, menstruation, puberty, menopause, fertilization, development of fertilized ovum, placenta and its functions, parturition.

References

- Wilson, K.J. and Waugh , A. (1999) , Ross and Wilson Anatomy and Physiology in health and illness. – Pp: 422-435
- Sebastian ,M.M (2001), Animal Physiology , Madonna Books , Amalagiri Kottayam– Pp: 302-303, 310-331
- Chatterjee, C.C. (2003), Human Physiology , Vol I & II Medical Allied Agency , 82/1 , Mahatma Gandhi Road , Kolkata – 700009.Pp: 4-203 -4- 285
- Hole, J.W (1989), Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa. – Pp 490-510.

Module V

Skeletal system

A general account of axial skeleton and appendicular skeleton.

References:

Hole, J.W (1989) , Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa. – Pp 136-153.

Module VI

Muscular system

General account of the system, types of muscles – striated, non-striated, muscle contraction.

References

Sebastian ,M.M (2001), Animal Physiology , Madonna Books , Amalagiri Kottayam– Pp 212-225

Hole, J.W (1989) , Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa. Pp 168-179

Suggested Readings:

- Ascend Publications Human Anatomy (2006) ,Nagampadom ,Kottayam-6
- Chatterjee, C.C. (2003), Human Physiology , Vol I & II Medical Allied Agency, 82/1, Mahatma Gandhi Road , Kolkata – 700009.
- Gyton and Hall (2000),Text book of Medical Physiology , 10th edition , Harcourt Asia PTE LTD Singapore
- Hole, J.W (1989) , Essentials of Human Anatomy and Physiology , 3rd edition , WCB publishers , Dubuque , Iowa.
- Sebastian ,M.M (2001), Animal Physiology , Madonna Books , Amalagiri Kottayam

- Subramanyam , S , Madavankutty , K and singh , H.D (2001) Text book of Human Physiology, S. chand and Co. Ltd , Ramnagar , New Delhi – 110055.
- Wilson , K.J. and Waugh , A. (1999) , Ross and Wilson Anatomy and Physiology in health and illness.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER II

CORE COURSE V - THERAPEUTIC NUTRITION

Total Hours of Instruction: 54

Credit: 3

Hours/ week: 4

Objectives

To enable the students to-

- Develop ability to plan balanced diet for various activity group and various socio economic levels.
- To learn how to plan and prepare diet for various diseases.

Module I

Modification of diet – fever, metabolism in fever, general dietary consideration'

Reference

Srilakshmi B, Dietetics (2006), New age International publishing Ltd, Pp. 167-170

Module II

Diet in gastrointestinal disease- Aetiology, Symptoms and dietary management of constipation, diarrhoea and peptic ulcer

Module III

Diet in Cardiovascular diseases - Aetiology, symptoms and dietary management of Atherosclerosis, Hypertension.

Reference

Bamji M.S and Reddy V (1998), Text Book of Human Nutrition, ford and IBH publishing Co. Ltd New Delhi. Pp- 341-350

Module IV

Diet in Diabetes mellitus– Aetiology, symptoms, types and dietary modifications.

Reference

Garrow J.S, James W. P.T and Ralph A, (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingstone, London. Pp 521-533

Module V

Diet in obesity and Leanness – Types causes, dietary modifications complications.

Reference

Gibney, M.J, Dinald A and Helon M.R,(2004) Nutrition & metabolism, Blaclawill publishing Pp: 321-333

Module VI

Diet in renal disease- Nephritis, Nephrosis, acute and chronic renal feature, renal calculi, dialysis. Causes, symptoms and dietary management.

Module VII

Feeding the patient – Psychology of feeding the patient

Reference

Robinson C.H, Lawler M.R, Cheweth W.L; and Gaswick A.E, (1986) Normal and Therapeutic Nutrition ,17th edition, Mac Milan Publishers, Pp 395-400.

Suggested Readings

- Mohan K. L, Krause M.V (2002), 2nd edition Food , nutrition and Diet Therapy, W.S. suders Co, Philadelphia.
- Antia P. Clinical Dietetics and Nutrition, 2nd edition, Oxford university press
- Guthrie H. A, Picciano M. F (1995), Human Nutrition, Mosby, St. Louis missionery.
- Michael Sharon (1994), Complete Nutrition, Avery publishing group. New York.

- Garrow J.S, James W. P.T, Ralph A, (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingstone, London

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER II

CORE COURSE VI - PROGRAMMING THROUGH 'C' LANGUAGE

Total hours of Instruction: 54

Credit:3

Hours/Week: 4

Objectives:

- To make the student to develop efficient algorithms and flowcharts for solving a problem
- To understand programming and solving problems using 'C'.

Module 1

Introduction to Programming

Algorithms, Flowcharts, Introduction to Programming

Reference

P. K. Sinha and Priti Sinha, Computer Fundamentals, BPB Publications, New Delhi, 3rd edition.

Balagurusamy, E., (2002) Programming in ANSI C, Edition 2.1, Tata McGraw – Hill Publishing company Ltd, New Delhi,

Module II

Introduction to 'C' Language

Importance of C, Basic structure of C Programs, Executing a C program

Constants, Variables and Data Types

Operators and Expressions, Basic input/output statements

References

Balagurusamy, E., (2002) Programming in ANSI C, Edition 2.1, Tata McGraw – Hill Publishing company Ltd, New Delhi.

Module III

Decision Making, Branching and Looping

Decision making with IF statement, The IF-ELSE statement, Nesting of IF-ELSE statements, The ELSE IF ladder, The switch statement

Loops: *while* loop, *do while* loop, *for* loop, Nested loops, Jumps in loops

References

Balagurusamy, E., (2002) Programming in ANSI C, Edition 2.1, Tata McGraw – Hill Publishing company Ltd, New Delhi. Pp:99-142.

Module IV

Arrays

One-dimensional arrays, Array manipulations, Two-dimensional arrays, Initializing arrays, Null terminated Strings as array of characters, Multidimensional arrays

References

Balagurusamy, E., (2002) Programming in ANSI C, Edition 2.1, Tata McGraw – Hill Publishing company Ltd, New Delhi.

Suggested Readings

Balagurusamy, E., (2002) Programming in ANSI C, Edition 2.1, Tata McGraw – Hill Publishing company Ltd, New Delhi.

P. K. Sinha and Priti Sinha, Computer Fundamentals, BPB Publications, New Delhi, 3rd edition.

Kanetkar, Y(2005) Let Us C, BPB Publications New Delhi.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

Semester III

Course Title	Hours/Week	Credit	Total Credit
Core Course – VII – Advanced Dietetics	4	4	20
Core Course VIII – Food Microbiology	4	3	
Core Course IX – Sanitation and Hygiene	4	3	
Core Course X – Practical Advanced Dietetics – I	3	2	
I Complementary Paper	3	3	
I Complementary Practical	2	1	
II Complementary Paper	3	3	
II Complementary Practical	2	1	
Job Training – Dairy Training	-	-	

SEMESTER III

CORE COURSE VII - ADVANCED DIETETICS

Total hours of instruction – 72

Credit – 4

Hours / Week : 4

Objectives

- To understand skills and techniques in the planning and preparation of therapeutic diet for various diseases and nutritional deficiencies.
- To gain knowledge in diet counselling and educating patients
- To understand the classification, diagnosis, aetiology, symptoms and dietetic management of various diseases.

Module I

- a) Pre and post operative diet, tube feeding, parenteral nutrition, IV feeding (intravenous feeding).

References

Charles (1999), Nutrition Secrets, Jaypee Brothers, New Delhi, P- 302-310.

- b) Diet in cancer

Reference

American cancer society – www.cancer.org

Module II

Diet in gastritis and peptic ulcer- Aetiology, symptoms, dietary management, chemically and thermally irritating foods.

Reference

Patient care- www.patientcareonline.com

Module III

Diet in diseases of liver- Aetiology, symptoms, dietary treatment in jaundice, hepatitis, cirrhosis and hepatic coma- dietary treatment in cholecystitis and cholelithiasis

Reference

Mahan L.K and Stump S.E, Krause , Food nutrition and diet therapy,

Pp: 740-748.

Module IV

Diet in Diabetes Mellitus – Aetiology, symptoms, types, test for detection, dietary treatment and complications of diabetes.

References

Raghuram ,T .C (2000), Diet and Diabetes Mellitus, National Institute of Nutrition , Hyderabad ,P : 95-103.

Module V

Diet in renal disease- symptoms, dietary treatment of glomerulonephritis, nephrosis, renal failure and dialysis.

Reference

Kumar .P. and Clark M (2005) , Clinical Medicine, 6th edition, Elsevier Saunders Publishing Co. Pp:605-687.

Module VI

Diet in cardiovascular disease- Atherosclerosis, Hypertension- aetiology, symptoms , dietary management.

Reference

Garrow ,J. S and James, W.P.T., Human Nutrition and Dietetics, P:619-637.

Module VII

Diet in allergy and skin disturbances- Definition, classification, symptoms, tests and dietetic treatment.

Reference

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi.

Module VIII

Diet and drug interaction

Reference

Robinson. C.H, Lawler M.R (1986), Normal and Therapeutic Nutrition, Macmillan Publishing Co, New York. Pp; 403-409.

Suggested Reading

- Gibney, M J., Elia.M, Ljungqvist. O (2005) ,Clinical Nutrition, Blackwell Science publishing Co.
- Guthrie, H.A & Picciano, M.F (1995), Mosby Publishing Co, New York,

- Etherton, P and Burus J.H.(1998), Cardiovascular nutrition, American Dietetic Association ,Chicago.
- Kumar .P., Clark M (2005) , Clinical Medicine, 6th edition, Elsevier Saunders Publishing Co.
- Nutrition and changing kidney function, National Kidney Foundation New York.
- Patient Education Handbook- Diabetic Education(2000), Good Shepherd Medical Centre, Texas.
- Swaminathan, M (1989), Hand Book of Food and Nutrition, Bangalore Printing & Publishing Co, Bangalore.
- [www.mediindia.net /patient/paediatrics](http://www.mediindia.net/patient/paediatrics).

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER III

CORE COURSE V111- FOOD MICROBIOLOGY

Total hours of instruction: 54

Credits: 3

Hours/ week: 4

Objectives

To enable the students to:

- to acquire an elementary knowledge about microorganisms
- to understand the role of microorganism in contamination and spoilage of different foods.

Module I

Introduction to Microbiology- Definitions of microbiology and microbes, Beneficial effects of microorganisms.

Microbial growth curve, effect of environmental factors on growth curve- PH, moisture, temperature, oxygen availability, nutrients and others.

Reference

Mani.A, Selvaraj.A.M , Narayanan.L.M , Arumugham.N.(1999), Microbiology- General and Applied, Saras publications , Nagarcil. Pp.1-9.

Module II

Microorganisms

General morphology, characteristics and economic importance of :

- A) Bacteria,
- B) Fungus
- C) Virus
- D) Algae
- E) Protozoa

Reference

James.M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi Pp.17-19

Frazier.W.C &Westhoff.D.C(1997), Food Microbiology,Tata McGraw-Hill publishing company Ltd,New Delhi.Pp.17-58.

Module III-

Food contamination and spoilage - Sources of contamination, types of spoilage of foods, classification of foods based on perishability, effect of microorganisms on food spoilage.

Reference

Frazier.W.C &Westhoff.D.C(1997), Food Microbiology,Tata McGraw-Hill publishing company Ltd,New Delhi.Pp.59-79.

Module IV

Cereals and cereal products - Contamination and spoilage of cereals and cereal products.

Reference

Frazier.W.C &Westhoff.D.C(1997), Food Microbiology,Tata McGraw-Hill publishing company Ltd,New Delhi.Pp.174-186.

Module V

Fats and Oils - Contamination and spoilage of fats and oils

References

Frazier.W.C &Westhoff.D.C(1997), Food Microbiology,Tata McGraw-Hill publishing company Ltd, New Delhi.Pp.310-312.

Module VI

Fruits and Vegetables - Contamination and spoilage of fruits and vegetables.

References

James, M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi Pp.187-196.

Module VII

Contamination and spoilage of Animal Products

- A) Milk and milk products
- B) Meat and poultry
- C) Fish and other sea foods
- D) Egg

References

Powar.C.B and Dagainawala H.F. (1999) General Microbiology , Vol.II , Himalaya Publishing House, Pp.42-58

James, M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi Pp.200-227

Module VIII

Canned Foods - Contamination and spoilage of canned foods

References

James, M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi Pp.243-247

Module IX

Sugar and Sugar Products - Contamination and spoilage of sugar and sugar products

Reference

James.M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi P: 239.

Module X

Control of Microbial Growth in Foods - Controlling Temperature, Removing Oxygen, Adding Chemical Preservatives, Reducing Moisture Content, Exposure to UV rays

Reference

Roday, S. (1999) Food Hygiene And Sanitation, Tata Mc Graw-Hill Publishing Co. Ltd, New Delhi Pp:19-22

Suggested readings

- Frazier.W.C &Westhoff.D.C(1997), Food Microbiology,Tata McGraw-Hill publishing company Ltd, New Delhi.
- James.M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi
- Mani.A, Selvaraj.A.M , Narayanan.L.M , Arumugham.N.(1999), Microbiology- General and Applied, Saras publications , Nagarcoil.
- Roday.S. (1999) Food Hygiene And Sanitation, Tata Mc Graw-Hill Publishing Co. Ltd, New Delhi.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

Job training

SEMESTER III
CORE COURSE IX –SANITATION AND HYGIENE

Total hours of instruction: 54

Credits: 3

Hours/ week: 4

Objectives

To enable the students to:

- Understand the role of microorganisms in food borne illness
- Know the need for implementing sanitary procedures and attitudes.

Module I

Introduction to Sanitation and Hygiene

Definitions of sanitation and hygiene, significance of sanitation in food industry.

Reference

Roday .S.(1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi.

Module II

Food Borne Illness

Food borne illnesses caused by Bacteria, Virus and Parasites

Reference

James.M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi. Pp.611-636, 651-657

Adams.M.R and Moss.M.O (2000) Food Microbiology, new Age International Ltd. New delhi Pp. 136-219.

Module III

Food Hazards

Natural toxicants in foods , Chemicals, antibiotics, Hormones and Metal contamination

Reference

Roday .S.(1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi .

James.M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi. Pp 641-650

Adams.M.R and Moss.M.O (2000 Food Microbiology, New Age International Ltd. New Delhi Pp. 219-223.

Module IV

Personal Hygiene of food handler

Importance of personal hygiene of food handler- habits, clothes, illness.

Reference

Roday .S.(1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi.

Module V

Hygienic Food Handling

Purchasing and receiving safe food—important points to be observed for various foods. Food storage- guidelines for storage, dry food storage, refrigerated storage, freezer storage. Storage of specific foods , storage of foods at high temperatures. Sanitary procedures while preparing, cooking and holding food. Safety of left over foods.

Reference

Roday , S. (1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi Pp 69-93.

Module VI

Cleaning Methods

Sterilization and Disinfection- products and methods, use of detergents, heat, chemicals, steps in cleaning utensils and equipments.

Reference

Roday .S.(1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi Pp 144-153

Module VII

Waste Product Handling

Planning for waste disposal-solid waste,liquid waste-sewage.

Reference

Roday .S.(1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi Pp .593-617.

Module VIII

Pest control.

Importance of pest control, classification of pests-houseflies, cockroach, rats.

Module IX

Relevance of microbiological standards for food safety.

Referance

James, M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi. Pp .413-448

Suggested readings

- Adams, M.R and Moss.M.O (2000 Food Microbiology, New Age International Ltd. New Delhi.
- James, M.J (1996) Modern Food Microbiology 4th edition, CBS Publications and distributors, New Delhi.
- Roday .S.(1999) Food Hygiene and Sanitation, Tata Mc Graw-Hill company Limited, New Delhi.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER III
CORE PRACTICAL X – ADVANCED DIETETICS I

Total hours of instruction – 36

Hours / Week: 3

Credit – 2

Objectives:

- To enable student to prepare diets for various diseases within specified cost limits.

Module I

Standardization of common food preparation.

Module II

Planning full, normal, soft, high and low caloric diet with modified fat and carbohydrate levels.

Module III

Planning and preparation of diet with modified consistency, fibre and residue.

Module IV

Planning and preparation of diet for diarrhoea and constipation and peptic ulcer.

Module V

Planning and preparation of diet in fever – Typhoid and Tuberculosis.

Module VI

Planning and preparation of diet for NIDDM patient.

Suggested Readings

- Antia F.P., Clinical Dietetics and Nutrition, 2nd ed. Oxford University, Delhi.

- Bhala S.M.L, Bhatia N, and Gopinath(1983) Diet Manual for heart patient, CTC, AHMS, New Delhi.
- Gibrey M.J, Elia. M, Gungquist. O, (2005), Clinical Nutrition, Blackwell Science Publishing Co.
- Mahan L.K, Stump S.E, Krause's, Food Nutrition and Diet Therapy.
- Patient care – [www. patientcareonline.com](http://www.patientcareonline.com)
- Robinson C.H., and Winely E.S (1984) Basic Nutrition and Diet Therapy 5th ed., Macmillian Pub. Co. New York.

Semester IV

Course Title	Hours/Week	Credit	Total Credit
Core Course XI – Quantity Food Production & Service	4	4	20
Core Course XII – Food Commodities	4	3	
Core Course XIII – Community Nutrition	4	3	
Core Course XIV – Practical Advanced Dietetics – II	3	2	
I Complementary Paper	3	2	
I Complementary Practical	2	2	
II Complementary Paper	3	2	
II Complementary Practical	2	2	
Hospital Internship	-	-	

SEMESTER- IV

CORE COURSE: XI – QUANTITY FOOD PRODUCTION AND SERVICE

Total hours of instruction : 72

Hours / Week : 4

Credit : 4

Objectives:

- To understand the application of basic principles to bulk production of the food.
- To gain knowledge regarding selection and purchase of food.
- To develop skills in menu planning for quantity preparation.
- To understand the different styles of food service in volume feedings.

Module I

Introduction to different food service outlets: Definition of catering industry, functions, types of catering establishments, commercial catering (hotels and restaurants), welfare catering (hospital), industrial catering and transport catering.

Reference

Kinton, R. and Cesarani, V. (1999), The theory of catering, 8th edition, ELBS publishing, Pp: 14-25

Module II

Different food and beverage outlet.

Reference

Varghese, B. (1999), Professional Food and Beverage Service Management, Macmillan India Ltd., Pp: 15-22

Module III

Menu planning: Sequence of course – Indian, (North Indian, South Indian, West Indian and Gujarathies) Western and others, Technique of writing menus, Functions of menu.

Reference

Varghese, B. (1999), Professional Food and Beverage Service Management, Macmillan India Ltd., Pp: 65-72

Module IV

Types of meals and styles of service – Breakfast, lunch, dinner, afternoon tea, snacks, table d'hôte and à la carte menu.

Reference

Colleer, M. and Sussams, C. (2000), Success in principles of catering, Richard Clay Ltd, Pp: 288-290

Module V

Introduction to basic and special equipment for food production and service: Care and use of equipment.

Reference

Andrews, S. (1997), Food and Beverage Service, Tata Mc-Graw Hill Publishing Company Ltd., Pp: 19-26

Module VI

Types of services of food and beverage outlets. Staff organization of different outlets – manager, hostess, supervisor, steward, waiter.

Reference

Varghese, B. (1999), Professional Food and Beverage Service Management, Macmillan India Ltd., Pp: 28-31, 47-49

Module VII

Beverages: Classification – alcoholic and non-alcoholic, hot and cold beverages.

Reference

Andrews, S. (1997), Food and Beverage Service, Tata Mc-Graw Hill Publishing Company Ltd., Pp: 87-123

Module VIII

Uses of bills and checks on control system outlets.

Reference

Andrews, S. (1997), Food and Beverage Service, Tata Mc-Graw Hill Publishing Company Ltd., Pp: 49-51

Module IX

Equipments in food service: Classification of equipments, factors for selection of equipments.

Reference

Sethi, M and Malhan, S (1991), Catering Management, Wiley Eastern Ltd, Pp:8-20

Module X

Planning food service unit: Layout of food plants, plans of areas of food preparation, different work centres, lighting and ventilation.

Reference

Roday, S (1999), Food hygiene and sanitation, Tata Mc Graw-Hill Publishing Ltd, New Delhi, Pp: 117-136.

Suggested Readings

- Anderson, F. (1996), Home Appliance Servicing Taraporwals Sons. & Co.
- Arora, K., (2002), Theory of Cookery, Frank Bros. & Co., Ltd., New Delhi.
- Avery, A.A, Modern Guide to Food Service Equipment, C.B, Publishings.
- Berry, M., (1995), Complete Cook Book, Dorling Kindersley Ltd., London.
- Fuller, J. (1983), Modern Restaurant Service, Hutckinson.
- Hsiung, D.T., (1994), Chinese Cantonese Cooking, Parragon Book Service Ltd., England.
- Johnson, J.B, (1995), Equipment for Modern Living, Macmillan company Ltd
- Khan, M.A. (1987), Food Service Operations, Avi Publishing Company.

- King, C.A., (1988), Professional Dining Room Management, VNR, New York.
- Lillicrap, D.K., (1989), Food and Beverage Service, 2nd edition, BLBS.
- Shiring, S.B., Jardine, R.W. and Mills, R.J (2000), Introduction to Catering, Thomson Asia Ltd., Singapore.
- Tompkins, D., Table Layout and Decoration, Ward Lock and Co. Ltd.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER- IV

CORE COURSE XII: FOOD COMMODITIES

Total hours of instruction –54

Hours / Week: 4

Credit – 3

Objectives:

- To understand the basic commodities, both raw and processed used in catering and various aspects of their production and distribution.
- To discuss the qualities and standard of available commodities and their suitability for different purposes.

Module I

Cereals and Pulses:

Cereals : Structure, composition and nutritive value, specific cereals, processing and breakfast cereals.

Pulses: Nutritive value, processing and toxic constituents.

Reference

Potter N.N, Hotchkiss J.H (1997), Food Science, Fifth edition. S.K. Jain for CBS publishers and Distributors, Durga Ganj, New Delhi.

Module II

Fats and Oils: Nutritive value, sources of fats and oils, extraction of edible oils and storage.

Reference

Botton. E.R, (1999), Oils, fats and fatty foods, their practical application, Biotech Publishing Company, Pp: 141-160

Module III

Egg: Nutritional aspects, structure, composition, egg quality and selection.

Reference

Sreelakshmi B (2005), Food Science, Third Edition, New Age International Publishing Ltd, Ansari Road, Dargagani, New Delhi.

Module IV

Fish, Poultry and Meat: Composition, nutritive value, selection, and storage.

Reference

Manay N.S, Shadakshara Swami M (2005), Foods – Facts and Principles. New Age International Publishers.

Module V

Vegetables and Fruits – Composition and nutritive value, selection and storage.

Reference

Khader. V (2003), Foods – Nutrition & Health, Fifth Edition, Xpress Graphi Delhi. Pp: 65-81

Module VI

Sugar and Related products: Nutritive value, sugar related products and sugar cookery.

Reference

Sreelakshmi B (2005), Food Science, 3rd Edition New Age International Publishing Ltd. Ansari Road, New Delhi. Pp: 212-220

Module VII

Milk and Milk products: Composition, Nutritive value, processing, and milk products.

Reference

Mc Williams. M (1997) Foods Experimental perspectives, 3rd edition, Mc Millian Publishing Company, New Jersey

Wikipedia.org/wiki/Dairy-product

www.Indiadairy.com

www.Indianmilkproducts.com

Module VIII

Miscellaneous Foods: Beverages (Tea, Coffee, and Chocolate), Spices and condiments, Raising Agents.

Suggested Readings

- Clarke. D, Herbert. E (1992).). Botton. E.R, (1999), Oils, fats and fatty foods, their practical application, Biotech Publishing Company
- Eckles C.H, Combs. W.B, Macy. H (1998). Milk and Milk Products, MC Graw Hill Companies.
- Gopalan. C, Ramashathri V.V, Balasubramanyan S.C (1996), Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR.
- Manay N.S, Shadaksharaswamy. M (2005),), Foods – Facts and Principles. New Age International Publishers.
- Matz. S.A (1996). The chemistry and technology of cereals and food of feed; Chapman & Hall, New York.
- Peckham C.G, Greaves H.T (1979). Foundation of food preparations, Mac Millan Publishing Co, New Delhi.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER - IV

CORE COURSE XIII – COMMUNITY NUTRITION

Total hours of instruction: 54

Hours / Week: 4

Credit: 3

Objectives:

- To understand the importance of nutrition in national progress and the significance of the assessment of nutritional status.
- To find solutions to overcome problems of malnutrition in the community.
- To study the role of national and international agencies in this area.

Module I

Introduction to nutrition and health in national development. Nutritional problems existing in our country. The causes of malnutrition in India.

Reference

Rao, K.S. (1997), Community Health Nursing, B.I. Publications Pvt. Ltd., Chennai, Pp: 82-85

Module II

Methods of assessment of nutritional status. Direct assessment and indirect assessment.

Reference

Gibney, M.J, Margetts, B.M, Kearney, J.M and Arab, L. (2005). Public Health Nutrition, Blackwell Publishing, USA, Pp: 66-81

Module III

Nutrition intervention schemes in the community – Lecture and method demonstrations, nutrition exhibitions and visual aids.

Reference

Ramachandran, L. and Dharmalingam, T. (2005), Health Education, Vikas Publishing House Pvt. Ltd., New Delhi, Pp: 224-233.

Module IV

National and International Agencies in Community Nutrition – ICDS, WHO, UNICEF, NIN, CFTRI.

Reference

Chalkley, A.M. (1990), A text book for the health worker, Vol. I, Wiley Eastern Limited, New Delhi, Pp: 130-133

Module V

Breast feeding and its implications. Hazards of bottle feeding.

Reference

Srilakshmi, B. (2004), Dietetics, New Age International Pvt. Ltd, New Delhi, Pp: 16-22.

Module VI

Weaning Foods – Planning, formulating and preparing, Importance of correct and timely weaning.

Reference

Chalkley, A.M. (1990), A text book for the health worker, Vol. I, Wiley Eastern Limited, New Delhi, Pp: 267-269

Module VII

Nutrition and infection – relationship, Immunization and its importance.

Reference

Lalitha. M, (1997), Major Issues in Food and Nutrition Science, Kanishka Publishers, New Delhi, Pp: 69-81

Rao, K.S. (1997), Community Health Nursing, B-I Publications Pvt. Ltd., New Delhi, Pp: 209-212.

Module VIII

Recent advances in community nutrition research – fortification, enrichment of foods.

Reference

Bamji, M.S, Rao, N.P and Reddy, V. (2003), Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, Pp: 470-479

Suggested Reading

- Dandiya, P.C, Zafer, Z.Y.K and Zafer, A. (2003), Health education and community pharmacy, Vallabh Prakashan Printers, New Delhi.
- Khader, V. (2003), Foods – Nutrition and Health, Kalyani Publishers, New Delhi.
- Park. K, (2005), Park's Textbook of Preventive and Social Medicine, 18th edition, Banarsidas Bhanot Publishers, Jabalpur.
- Reddy, R.S. (1998), Nutrition Education, Commonwealth Publishers, New Delhi.
- Sreedevi, V. (1997), Nutrition Education, Discovery Publishing House, New Delhi.
- Swaminathan, M. (2004), Food and Nutrition, Vol. II, 2nd edition, BAPPCO Publishers, Bangalore.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER - IV
CORE PRACTICAL XIV – ADVANCED DIETETICS II

Total hours of instruction : 36

Hours per week : 3

Credit : 2

Objectives

- To emphasis skill development in the formulation and use of diet prescriptions.
- To provide greater exposure to dietetic practices followed in Indian hospital.

Module I

Planning and preparation of diet for hypertensive patient.

Module II

Planning and preparation of diet in glomerulonephritis, nephrosis and renal failure.

Module III

Planning and preparation of diet in cancer.

Module IV

Planning and preparation of diet in obesity.

Module V

Planning and preparation of diet in atherosclerosis.

Module V

Planning and preparation of diet in surgery.

Suggested Readings

- Bhala S.M.L, Bhatia N, Gopinath. Diet Manual for heart patient, CTC, AHMS, New Delhi (1983)
- Gibney M.J, Elia M Ljinguist. O (2005), Clinical Nutrition, Backwell Science Publishing Co.
- Robinson C.H and Winely E.S, Basic Nutrition and Diet Therapy 5th ed, Macmillian Pub. Co. New York (1984)
- Swaminathan M (2002) Food and Nutrition, Volume I, The Bangalore Printing and Publishing Company to Ltd.

INTERNAL EVALUATION

Job training

Semester V

Course Title	Hours/Week	Credit	Total Credit
Core Course XV – Fundamentals of Biochemistry	5	4	20
Core Course XVI – Personnel Management	4	4	
Core Course XVII- Family Meal Management	4	4	
Core Practical XVIII – Family Meal Management	4	2	
Core Practical XIX – Human Physiology	4	2	
Open Course – Food Preservation	4	4	

SEMESTER - V

CORE COURSE XV- FUNDAMENTALS OF BIOCHEMISTRY

Total hours of instruction: 72

Credit: 4

Hours per week: 5

Objectives

- To understand knowledge about biomolecules which are the basis of life.
- To study about energy currency of the cell and chemical messengers.

Module I

Molecular Aspect of transport - Passive diffusion, Facilitated diffusion, Active transport, Sodium-Potassium pump. transport of macromolecules : Endocytosis, exocytosis.

Reference

Satyanarayana U (2005) Biochemistry, Uppala Author Publisher Interlinks, Vijayawada. Pp: 565-569.

Module II

Biological Oxidation

High energy compounds, mechanism of electron transport chain, oxidative phosphorylation.

Reference

Deb A.C (2002), Fundamentals of Biochemistry, 8th edition, New Central Book Agency, Kolkata, Pp: 141-162

Satyanarayana U (2005), Biochemistry, Uppala. Author – Publisher Interlinks, Vijayawada. Pp: 228-240

Module III

Genetic Control of Metabolism.

Nucleic acids: DNA – Structure, function, replication RNA: Types structure and functions. DNA repair mechanisms, genetic code and protein biosynthesis.

Recombinant DNA Technology: Applications, Restriction endonucleases, vectors, gel electrophoresis, blotting techniques, hybridoma technology, PCR, DNA finger printing.

Reference

Murray K.R, Granner D.K (2003), Harper's Illustrated Biochemistry, 26th edition, Lange Medical Publications, London, Pp: 378-432.

Satyanarayan U (2005), Biochemistry, Uppala Author Publisher Interlinks, Vijayawada, Pp: 577-586

Module IV

Hormones: Pituitary, Adrenal, Thyroid and Reproductive hormones, Prostaglandins.

Reference

Talwar G.P, Srivastava L.M (2003), Textbook of Biochemistry and Human Biology, 3rd edn, Prentice – Hall of India Private Ltd, Pp: 771-781

Deb A.C (2002), Fundamentals of Biochemistry, 8th edition, New Central Book Agency, Kolkata, Pp: 462-485

Module V

Enzymes: Definition, classification, mechanism of action, coenzyme.

Reference

Satyanarayana U (2005), Biochemistry, Uppala Author – Publisher Interlinks, Vijayawada, Pp: 577-586.

Suggested Readings

- Devlin T.M (2002), Text book of Biochemistry with Clinical Correlations, A John Wiley and Sons Publications.
- Fatima D. et al, (1999) Biochemistry, Saras Publication, Nagarcoil, Tamil Nadu.
- Leninger A.L (1987), Principles of Biochemistry, CBS Publishers and Distributors.
- Pattabhiraman T.N (1993), Principles of Biochemistry, Prithvi Book Agency.
- Rao K.R (1986), Text book of Biochemistry III Edition, Prentia Hall of India Ltd, New Delhi.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER - V

CORE COURSE XVI – PERSONNEL MANAGEMENT

Total hours of instruction: 72

Credit: 4

Hours / Week: 4

Objectives

To enable the students to

- Understand the management of human and material resources in food service establishment.

Module I

Organisation and management – Definition and types of organization, definition, functions and tools of management, technique of effective management, energy and time management and its application to food preparation and science.

References

- Chunawalla, S.A (2000), Essentials of Management, Himalaya Publishing House, Mumbai, Pp: 114-139
- Mamoria, C.B (2000), Personnel Management, Himalaya Publishing House, Mumbai, Pp: 117-139.
- Rao, P.S (2000), Personnel and Human Resource Management, Himalaya Publishing House, Mumbai. Pp: 28-40
- Sethi, M. and Malhan, S. (2008), Catering Management, New Age International Publishers, New Delhi, Pp: 1-40

Module II

Food Material Management – Meaning, definition, importance, food selection, purchasing, receiving and store-room management.

References

- Jitendra, M.D (1999), Catering Management, Dominant Publishers and Distributors, Delhi, Pp: 192-226, 111-176

Sethi, M. and Malhan, S. (2008), Catering Management, New Age International Publishers, New Delhi, Pp: 1-40

Module III

Personnel Management – Recruitment, selection and training of personnel, work standards, productivity, supervision, performance appraisal, motivations, incentives for effective performance.

References

Chunawalla, S.A (2000), Essentials of Management, Himalaya Publishing House, Mumbai. Pp: 156-169

Mamoria, C.B (2000), Personnel Management, Himalaya Publishing House, Mumbai. Pp: 403-446, 203-233

Rao, P.S (2000), Personnel and Human Resource Management, Himalaya Publishing House, Mumbai. Pp: 53-85

Sethi, M. and Malhan, S. (2008), Catering Management, New Age International Publishers, New Delhi, Pp: 331-343, 350-358

Module IV

Laws affecting food service operations, union and contract negotiations. Visits to different types of food service institutions to study the following.

(eg: Hospitals, flight kitchen, hotel, restaurant, canteen (industrial))

- a) Organization
- b) physical plan and layout
- c) Food Service Equipment
- d) Sanitation and hygiene

References

Pylee, M.V and George, A.S (2007), Industrial Relations & Personnel Management, 2nd ed. Vikas Publishing House, New Delhi, Pp: 172-189

Sethi, M. and Malhan, S. (2008), Catering Management, New Age International Publishers, New Delhi, Pp: 387-399.

Suggested Readings

- Chunawalla, S.A (2000), Essentials of Management, Himalaya Publishing House, Mumbai.
- Jitendra, M.D (1999), Catering Management, Dominant Publishers and Distributors, Delhi.
- Mamoria, C.B (2000), Personnel Management, Himalaya Publishing House, Mumbai.
- Pylee, M.V and George, A.S (2007), Industrial Relations & Personnel Management, 2nd edition, Vikas Publishing House, New Delhi.
- Rao, P.S (2000), Personnel and Human Resource Management, Himalaya Publishing House, Mumbai.
- Sethi, M. and Malhan, S. (2008), Catering Management, New Age International Publishers, New Delhi.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER V

CORE COURSE XVII– FAMILY MEAL MANAGEMENT

Total hours of instruction – 72

Credit – 4

Hours / Week: 4

Objectives:

To enable the students to:

- Acquire knowledge of the principles of planning diets for various stages of life.
- Develop ability to plan balanced diet for various activity groups and for various socio-economic levels.

Module I

Introduction to meal management: Balanced diet.

Meal planning: Principles and steps in meal planning.

References

Bamji, M.S, Reddy V (1998), Text Book of Human Nutrition, Oxford & IBH Publishing Co, New Delhi, Pp: 186-192

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 1-19

Swaminathan, M (1989), Hand Book of Food and Nutrition, Bangalore Printing & Publishing Co, Bangalore. Pp: 162-169

Module II

Nutritional and Food Requirements for Adults: Nutrients requirements.

Reference

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 15-17

Wardlaw. G, M and Insel, P.M (1993). Perspectives in Nutrition 2nd edition, Mosby Publishing Co, London. Pp: 555-562

Module III

Nutrition in Pregnancy: Physiologic changes during pregnancy, Nutritional requirements, General dietary problems, complication of pregnancy.

Reference

Robinson. C.H, Lawler M.R (1986), Normal and Therapeutic Nutrition, Macmillan Publishing Co, New York. Pp: 265-276

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 88-102

Module IV

Nutrition during Lactation: Physiology of lactation, nutritional requirements, dietary guidelines during lactation.

Reference

Wardlaw. G, M and Insel, P.M (1993). Perspectives in Nutrition 2nd edition, Mosby Publishing Co, London. Pp: 509-515

Srilakshmi, B. (2005), Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 103-109

Module V

Nutrition during infancy: Growth and development, nutritional requirements, Breast feeding, Artificial feeding.

Reference

Guthrie, H.A & Picciano, M.F (1995), Mosby Publishing Co, New York, Pp: 544-560

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 21-34.

Module VI

Nutritional requirements for Pre-school children: Nutritional and Food requirements, Nutrition related problems of preschoolers – PEM and Vitamin A deficiency.

Reference

Robinson. C.H, Lawler M.R (1986), Normal and Therapeutic Nutrition, Macmillan Publishing Co, New York. Pp: 306-308

Srilakshmi, B. (2005), Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 45-64.

Module VII

Nutrition of School Children : Nutritional requirement, Feeding problems, Packed lunches.

Reference

Guthrie, H.A & Picciano, M.F (1995), Mosby Publishing Co, New York. Pp: 375-378

Srilakshmi, B. (2005), Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 65-69

Module VIII

Nutrition during Adolescence: Nutritional requirements, Food habits, Nutritional Problems.

Reference

Guthrie, H.A & Picciano, M.F (1995), Morby Publishing Co, New York Pp: 585-593

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 80-86.

Module IX

Nutrition during old age: Factors affecting nutrition of elderly persons, nutritional requirements, nutrition related problems of old age.

Reference

Guthrie, H.A & Picciano, M.F (1995), Morby Publishing Co, New York, Pp: 603-615

Srilakshmi, B. (2005). Dietetics, 5th edition, New Age International Publishers, New Delhi. Pp: 111-122.

Suggested Readings

- Bamji, M.S, Reddy V (1998), Text Book of Human Nutrition, Oxford & IBH Publishing Co, New Delhi.
- Gibney M.J, Elia M Ljingquist. O (2005), Clinical Nutrition, Backwell Science Publishing Co.
- Robinson C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy 5th ed, Macmillian Pub. Co. New York .
- Swaminathan M (2002) Food and Nutrition, Volume I, The Bangalore Printing and Publishing Company to Ltd.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER V

CORE PRACTICAL XVIII – FAMILY MEAL MANAGEMENT

Total hours of instruction: 36

Credit: 2

Hours / Week: 4

Objectives:

To enable the students to

- Learn the principles of meal planning
- Plan and prepare meals for the family members at different income levels and different physiological status

Module I

Basic principles of meal and menu planning.

Module II

Daily food guide – Basic five food groups, use of food groups, food costing.

Module III

Planning for adult man and woman during different physical activities – sedentary, moderate and heavy workers, preparation of above diets.

Module IV

Planning and preparation of a balanced diet for a pregnant woman, nutritional requirements, modification of dietary pattern, complications during various stages of pregnancy.

Module V

Planning and preparation of a balanced diet for a nursing mother, modification of normal meal pattern, special foods given during lactation, nutritional requirements.

Module VI

Nutrition during infancy – nutritional requirements during infancy, advantages of breast feeding, disadvantages of bottle feeding.

Module VII

Supplementary feeding – preparation of weaning foods.

Module VIII

Planning and preparation of diet for a toddler, pre-school child – nutritional requirements, food pattern acceptance.

Module IX

Nutrition during school age – nutritional considerations, planning and preparation of meals/packed lunch.

Module X

Nutrition during adolescence – growth and development, nutritional requirements, factors influencing food habits, preparation of meals.

Module XI

Planning a diet for a senior citizen, factors affecting food intake and nutrient use, special needs, nutritional requirements, preparation of meals.

Module XII

Planning of meals for a middle income family, important considerations in planning meals.

Suggested Readings

- Guthrie, H.A. (1985), Introductory Nutrition, 6th edition, Times Mirror/Mosby College Publication, St. Louis.
- Mudambi, S.R and Rajagopal M.V, Fundamentals of food and nutrition, 34d ed, Wiley Eastern Ltd., New Delhi – 19.
- Recommended Dietary Intake for Indians, ICMR (2002)

SEMESTER V

CORE PRACTICAL XIX - HUMAN PHYSIOLOGY

Total hours of instruction: 36

Credit:2

Hours/ week: 4

Objectives:

- To enable the students to identify and analyses body cells and fluids.
- To gain technical skill in physical examination of body.

Module I

Microscopic examination of prepared slides- examine and .draw the following tissues

- a) Squamous, ciliated and columnar epithelia.
- b) Bone and cartilage
- c) Smooth, cardiac and striated muscle
- d) Nerve cell

Module II

Physical examination of body

- a) Pulse rate at rest and after exercise
- b) Determination of arterial blood pressure
- c) Measurement of body temperature: mouth, armpit, diurnal rhythm.

Module III

Examine the model: identify and draw

- a) Section of human heart
- b) Section of human kidney

Module IV

Examination of blood

- a) Smear preparation of human blood for RBC and WBC types
- b) Haematocrit of man
- c) Estimation of haemoglobin of man
- d) Testing of blood groups
- e) Enumeration of RBC of human blood
- f) Enumeration of WBC of human blood

Module V

Biochemical detection of abnormal constituents of urine

- a) Sugar
- b) Blood
- c) Albumin

Module VI

Quantitative analysis of Sugars

- a) Glucose
- b) Fructose
- c) Maltose

Suggested Readings

- Chatterjee C.C (2003), Human Physiology, Kalyani Mukherjee Publishers, Kolkata.
- Wilson K J and Waugh A, (1999), Anatomy and Physiology in Health and Disease, British library of cataloguing in publishing data, London.

SEMESTER V

OPEN COURSE – FOOD PRESERVATION

Total hours of instruction: 72

Credit: 4

Hours/ week: 4

Objectives:

To enable students to

- To gain knowledge on spoilage.
- To understand different methods of preservation.

Module I

Principles of Food Preservation – Food spoilage, principles and importance of food preservation.

Reference

Manay N.S, Shadaksharaswami M (1998), Foods Facts and Principles, New Age International Pvt. Ltd., New Delhi. Pp: 469-474.

Frazier. W.C & Westhoff. D.C (1997), Food Microbiology, Tata Mc Graw-Hill Publishing Company Ltd., New Delhi. Pp: 83-90.

Module II

Methods of Preservation: Temperature, Preservatives Concentration, Fermentation and drying.

Reference

Sreelakshmi B (2005), Food Science, 3rd Edition, New Age International Publishing Ltd., Ansari Road, New Delhi. Pp: 334-345.

Module III

Preservation of fruits and vegetables: Use of heat, low temperature, drying and preservatives.

Module IV

Preservation of milk and milk products: Use of heat, drying, low temperature, preservatives and other methods.

Module V

Preservation of Meat, Fish, Poultry and Egg: Use of heat, low temperature, drying and preservatives.

Suggested Readings

- Kalia M, Sood. S (2000), Food Preservation and Processing, Kalyani Publishing, New Delhi.
- Potter N.N, Hotchkiss J.H (1996), Food Science C.B.S. Publication, New Delhi.
- Vangarde S.J, Wood Burn M (1999), Food Preservation and Safely, Surabhi Publications, Jaipur.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

Semester VI

Course Title	Hours/Week	Credit	Total Credit
Core Course XX – Nutritional Biochemistry	5	4	20
Core Course XXI – Clinical Nutrition	5	4	
Core Course XXII – Research Methodology and Statistics	5	4	
Core Practical XXIII –Quantity Food Production	4	3	
Core Practical XXIV –Food Science	4	3	
Core Practical XXV –Community Nutrition	4	1	
Project	1	1	

SEMESTER VI

CORE COURSE XX -NUTRITIONAL BIOCHEMISTRY

Total hours of instruction: 72

Credit: 4

Hours/ week: 4

Objectives

To enable the students to-

- Gain an understanding of the application of biochemistry in foods, nutrition and diet therapy.
- Know the different metabolic pathways of macronutrients in human body.

Module I

Carbohydrate Metabolism

Function. Classifications and structure; Digestion, absorption and transport of carbohydrate; Metabolism of glucose (glycolysis), fructose and galactose; Metabolism of pyruvate and lactate; Metabolism of acetyl Co A (TCA cycle); Synthesis of ribose (HMP Shunt); Synthesis of glucose from noncarbohydrates (gluconeogenesis); Metabolism of Glycogen- Glycogenesis and Glycogenolysis.

References

Satyanarayana.U(2005), Biochemistry, Uppala Author-Publisher Interlinks, Vijayavada, A.P. Pp.251-290.

Hames B.D and Hooper N.M (2001) Instant notes on Biochemistry, Viva books private limited, New Delhi, Pp: 267-309.

Module II

Lipid metabolism

Function, classifications and structure ; Digestion, absorption and transport of lipids; Metabolism of Triacylglycerol, synthesis of fatty acid-saturated and unsaturated; Beta-oxidation of fatty acid- saturated and unsaturated;

Metabolism of Cholesterol; Metabolism of Ketonebodies, Glycolipids and Phospholipids.

References

Satyanarayana.U (2005), Biochemistry Uppala Author-Publisher Interlinks,Vijayavada,A.P. Pp.293-341.

Hames B.D and Hooper N.M (2001) Instant notes on Biochemistry, Viva books private limited, New delhi.Pp.311-342.

Jain J.L , Jain S , Jain N.(2005),Fundamentals of Biochemistry, S.Chand & Company LTD , New Delhi. Pp: 594-640.

Module III

Protein metabolism

Function, classifications and structure; Digestion, absorption and transport of proteins; Protein biosynthesis, General pathways of aminoacid Metabolism -Deamination,transamination,decarboxylation,decarboxylation and demethylation; urea cycle and fate of ammonia.

References

Satyanarayana.U(2005), Biochemistry,Uppala Author-Publisher Interlinks,Vijayavada,A.P. Pp.45-71,343-395.

Jain J.L , Jain S , Jain N.(2005),Fundamentals of Biochemistry, S.Chand & Company LTD , New Delhi. Pp: 641-674.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER VI
CORE COURSE XXI – CLINICAL NUTRITION

Total Hours of Instruction: 72

Credits – 4

Hours/Week: 5

Objectives

- To be familiar with the dietary/behavior modifications based on physiological changes occurring in disease condition.
- To obtain knowledge regarding metabolic process of normal and diseased organs and tissues.
- To acquire knowledge regarding effect of various diseases on nutritional status and nutrient requirements.

Module I

Disorders of metabolism – Inborn errors of metabolism (very brief), govt.

Reference

Deb. A.C, Fundamentals of biochemistry, Eighth edition (2004), Pp: 537-538, 264-266, 449-454.

Module II

Disease of gastrointestinal track – Aetiology symptoms, dietary modifications of ulcerative colitis, malabsorption syndromes, flatulence.

Reference

Antia F.P and Abraham P (1997), 4th Edition – Clinical dietetics and nutrition, Oxford University Press, New York, Pp:257-293.

Module III

AIDS – Causes, symptoms and dietary management.

Reference

Mahan L.K, Stump S.E, Krause's Food Nutrition and Diet Therapy, 11th edition, 2000, Pp – 1032-1051.

Module IV

Carbohydrates: Functions, Digestion, absorption. Dietary fibre and nutritional importance.

Reference

Robinson C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy 5th ed, Macmillian Pub. Co. New York Pp; 67-77.

Module V

Lipids: Digestion, absorption, storage, production of ketone bodies, ketosis and ketogenic diet.

Reference

Robinson C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy 5th ed, Macmillian Pub. Co. New York ,Pp – 88-90, 606.

Module VI

Protein: Digestion, absorption, utilization of dietary protein and amino acid in the body, measurement of protein quality. Improving protein quality of foods.

Reference

Robinson C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy 5th edition, Macmillian Pub. Co. New York Pp:48-58.

Suggested Readings

- Mahan L.K, Stump S.E, Krause's Food Nutrition and Diet Therapy, 11th edition.
- Robinson C.H and Winely E.S, (1984). Basic Nutrition and Diet Therapy 5th ed, Macmillian Pub. Co. New York.
- Antia F.P and Abraham P (1997), 4th Edition – Clinical dietetics and nutrition, Oxford University Press, New York.

INTERNAL EVALUATION

Assignments - Best two assignments are considered per course.

Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER VI
CORE COURSE XXII – RESEARCH METHODOLOGY AND
STATISTICS

Objectives:

To enable the students to learn

1. The fundamentals of statistics
2. Practical application of statistics in research

Module I

An introduction to research methodology, meaning, objectives, characteristics of research, types of research, criteria of good research.

Reference

Kothari, C.R (2004), Research Methodology, 2nd edition, New Age International Pvt. Ltd., New Delhi. P: 1-21

Module II

Methods and tools of data collection. Methods: Survey, observation, interview, case study. Tools : Questionnaire

Collection of secondary data.

Reference

Kothari, C.R (2004), Research Methodology, 2nd edition, New Age International Pvt. Ltd., New Delhi. P: 95-12.

Module III

Collection, Sampling and tabulation of data, diagrammatic representation of data line and bar diagram, frequency polygon and pie diagram.

Reference

Gupta S.C (2000), Fundamentals of statistics, Himalaya Publishing House, Mumbai. P: 27-225.

Module IV

Statistical Methods and Analysis – Mean, Median, Mode, Standard deviation and variance.

Reference

Pillai R.S, Bagavathi. V, (2002), Statistics, S. Chand and Company Ltd, Chennai. P: 121-305

Suggested Readings

- Ahnad Q.S, Ismail M.V, Khan S.A (2008), Biostatistics, University Science Press, New Delhi.
- Best J.W., Khan J.V (2003), Research in education, 9th edition, Prentice Hall of India Althoel S.C., (2002), Statistics, Cambridge University Press, UK.
- Sharma K.R (2002). Research Methodology, National Publishing House, New Delhi.
- Sophian C (1995), Representation and reasoning in early numerical development, counting, conservation, and comparison between sets. P: 559-577

INTERNAL EVALUATION

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Seminar/ Viva - The students has to take a minimum of one seminar per course.

Class test - A minimum of two class tests are to be attended. The grades of best two tests are to be taken.

SEMESTER VI

CORE PRACTICAL XXIII –QUANTITY FOOD PRODUCTION

Total hours of instruction: 54

Credit: 3

Hours/ week: 4

Objectives

- To enable students to organize, prepare and serve food for three different meals.

Module I

Rice and wheat preparations: Rice preparations -Chicken biriyani, Vegetable pulao, Tomato Rice, French Fried Rice, Coconut Rice (any three)

Wheat Preparations – stuffed paratha, spicy potato puri, hopper, crumb chops, spring roll (any three)

Module II

Pulse preparations – Channa chole, Dhal cutlet, Dhal kofta curry, Dhal Makhani (any three)

Module III

Vegetable preparations: Gobi Manjuriam, Vegetable Khorma, Shahi Mattar, Stuffed potatoes (any three)

Module IV

Meat and Fish preparations: Meat preparations: Butter chicken, chicken curry, masala, steaks beef roast with tomato gravy (any three)

Fish preparations: Tomato fish, chilly fish, fish molee, fish foogath (any three)

Module V

Snacks: Finger fish, Rainbow sandwich, Onion Pakoda, Vegetable burger (any three)

Module VI

Sweets: Carrot burfi, bread gulab jamun, banana balls, coconut sweet (any three)

Module VII

Puddings & Desserts: Pineapple and tender coconut pudding, chocolate pudding, bread pudding, fruit trifle (any three)

Suggested Readings

- Khandwala V. (1987), Relish Food the Vegetarian Way, Vakils, Feffer and Simons Ltd., Bombay.
- Mathew K.M (2000), Modern Kerala Dishes.
- Ravindran B. (1990), My Favourite Recipes – Puddings and Desserts, Bhavi Publishing, Cochin.

SEMESTER VI
CORE PRACTICAL XXIV –FOOD SCIENCE

(Internal evaluation only)

Total hours of instruction: 54

Credit: 3

Hours/ week: 4

Sugar Cookery

Starch Cookery

Meat, fish and poultry – changes during cooking.

Egg cookery

Milk cookery

Fruits and vegetables

1. Darkening of fruits
2. Effect of acid and alkali on pigments
3. Sensory evaluation

SEMESTER VI

CORE PRACTICAL XXV - COMMUNITY NUTRITION

Total Hours of Instruction: 18

Hours/Week – 4

Credit - 1

Objectives

To enable the students to

- Develop skills in field level application of the techniques of assessing nutritional status.
- Acquire skills in organizing and implementing community nutrition projects.

Module I

Techniques of nutritional assessment

- a) Anthropometry – Height, Weight, MUAC, BMI, WHR and growth monitoring.
- b) Diet survey – 24 Hrs dietary recall.
- c) Clinical Examination – Eyes, hair, nails, skin, lips, tongue, gums, teeth.
- d) Biochemical methods – Haemoglobin, blood and urine glucose.

Module II

Nutrition Education –

Conduct Nutrition education programme to various groups using visual aids.

Module III

Observation

- a) Noon meal programme
- b) Functioning of an anganwadi.

Project