

COURSE PROFILE- (2019-2020 B.SC CLINICAL NUTRITION AND DIETETICS

SEMESTER I

Course Code	Title of the Paper	Credits	Hours/Week	Total Hours	L-T-P	CA	SE	Total
	Part - I Foundation Course Language	3	5			40	60	100
	Part – II Foundation Course English	3	5			40	60	100
CN18/1C/FSE	Part – III (Core -1) Food Science	5	7	105	4 3 0	40	60	100
CN18/2C/PR1*	Practical 1 (Core -3) Food Science and Physiology Practical	-	3	45	0 0 3	-	-	-
	Part III (Allied-1) Allied Chemistry I	4	4	60		40	60	100
	Allied Practical 1** Allied Chemistry Practical	-	2	30		-	-	-
CN18/IN/ART	Part –IV (Non Major Elective) 1a/b/c: Basic Tamil/Advanced Tamil/ Art of Interior Decoration	2	2	30		-	50	50
	Soft skill 1	3	2			-	50	50
Total		20						

***Practical examination (CN18/2C/PR1) – Food Science and Physiology Practical will be conducted in the second semester.**

****Allied Practical 1 will be conducted in the second semester**

SEMESTER II

Course Code	Title of the Paper	Credits	Hours/ Week	Total hours	L-T- P	CA	SE	Total
	Part – I Foundation Course Language	3	5			40	60	100
	Part – II English	3	5			40	60	100
CN18/2C/PHY	Part –III (Core – 2) Physiology	5	7	105	4 3 0	40	60	100
CN18/2C/PR1*	Practical 1 (Core - 3) Food Science and Physiology Practical	3	3	45	0 0 3	40	60	100
	Part –III (Allied -2) Allied Chemistry II	4	4	60		40	60	100
	Allied Practical 1** Allied Chemistry Practical	2	2	30		40	60	100
CN18/2N/BFP	Part –IV (Non Major Elective)1a/b/c: Basic Tamil/Advanced Tamil/Basics of Food Preservation	2	2	30	1 1 0	-	50	50
	Soft skill 2	3	2				50	50
Total		25	30					

* Practical examination (CN18/2C/PR1) – Food Science and Physiology practical will be conducted in the second semester

**Allied Practical 1 will be conducted in the second semester

SEMESTER III

Course Code	Title of the Paper	Credits	Hours/Week	Total hours	L-T-P	CA	SE	Total
	Part – I Foundation Course Language	3	5			40	60	100
	Part – II Foundation Course English	3	5			40	60	100
CN18/3C/HNU	Part – III (Core - 4) Human Nutrition	5	7	105	4 3 0	40	60	100
CN18/4C/PR2*	Practical 2 (Core-6) Human Nutrition and Nutrition Through Life Cycle Practical*	-	3	45	0 0 3	-	-	-
CN18/3A/MIC	Part –III (Allied-3) Microbiology	4	4	60	3 1 0	40	60	100
CN18/4A/PR1**	Allied Practical** Microbiology and Nutritional Biochemistry Practical	-	2	30	0 0 2	-	-	-
	Part –IV (Skill Based) Environmental studies	2	2	30		-	50	50
	Soft skill 3	3	2			-	50	50
Total		20	30					

***Practical examination (CN18/4C/PR2) – Human Nutrition and Nutrition through Lifecycle Practical will be conducted in the fourth semester.**

****Practical examination (CN18/4A/PR1) – Microbiology and Nutritional Biochemistry Practical will be conducted in the fourth semester.**

SEMESTER IV

Course Code	Title of the Paper	Credits	Hours/Week	Total hours	L-T-P	CA	SE	Total
	Part – I Foundation Course Language	3	5	75		40	60	100
	Part – II Foundation Course English	3	5	75		40	60	100
CN18/4C/NLC	Part – III (Core 5) Nutrition Through Lifecycle	5	7	105	4 3 0	40	60	100
CN18/4C/PR2*	Practical 2 (Core-6)* Human Nutrition and Nutrition Through Life Cycle Practical	4	3	45	0 0 3	40	60	100
CN18/4A/NBC	Part- III (Allied - 4) Nutritional Biochemistry	4	4	60	3 1 0	40	60	100
CN18/4A/PR1**	Allied Practical** Microbiology and Nutritional Biochemistry Practical	2	2	30	0 0 2	40	60	100
	Part –IV (Skill Based) Value Education	2	2	30		-	50	50
	Soft skill 4	3	2			-	50	50
Total		26	30					

***Practical examination (CN18/4C/PR2) – Human Nutrition and Nutrition through Lifecycle Practical will be conducted in the fourth semester.**

****Practical examination (CN18/4A/PR1) – Microbiology and Nutritional Biochemistry Practical will be conducted in the fourth semester.**

SEMESTER V

Course Code	Title of the Paper	Credits	Hours/ Week	Total hours	L-T- P	CA	SE	Total
CN18/5C/FM1	Core -7 Food Service Management I	4	4	60	3 1 0	40	60	100
CN18/5C/HFS	Core- 8 Human Development and Family Studies	4	5	75	4 1 0	40	60	100
CN18/5C/BCL	Core -9 Biomarkers in Clinical Nutrition	4	5	75	4 1 0	40	60	100
CN18/5C/MT1	Core- 10 Medical Nutrition Therapy I	4	5	75	3 2 0	40	60	100
CN18/5E/IDH	Elective -1 Interior Decoration and Housekeeping	5	5	75	4 1 0	40	60	100
CN18/6C/PR3*	Practical 3 (Core - 14)* Food Service Management Practical	-	3	45	0 0 3	-	-	-
CN18/6C/PR4**	Practical 4 (Core - 15)** Medical Nutrition Therapy Practical	-	3	45	0 0 3	-	-	-
Total		21	30					
	Self study paper- Health Psychology	2	-	-	-	-	100	100
<p>*Practical examination (CN18/6C/PR3) – Food Service Management Practical will be conducted in the sixth semester.</p>								
<p>**Practical examination (CN18/6C/PR4) – Medical Nutrition Therapy Practical will be conducted in the sixth semester.</p>								

SEMESTER VI

Course code	Title of the paper	Credits	Hour s/ week	Total hours	L-T- P	CA	SE	Tota l
CN18/6C/FM2	Core -11 Food Service Management II	3	4	60	3 1 0	40	60	100
CN18/6C/MT2	Core -12 Medical Nutrition Therapy II	4	5	75	3 2 0	40	60	100
CN18/6C/SPN	Core- 13 Sports Nutrition	4	5	75	3 2 0	40	60	100
CN18/6E/PHN	Elective -2 Public Health Nutrition	5	5	75	4 1 0	40	60	100
CN18/6E/FPR	Elective-3 Food Preservation	5	5	75	4 1 0	40	60	100
CN18/6C/PR3*	Practical 3 (Core - 14) Food Service Management Practical	3	3	45	0 0 3	40	60	100
CN18/6C/PR4**	Practical 4 (Core - 15)Medical Nutrition Therapy Practical	3	3	45	0 0 3	40	60	100
Total		27	30	30				
*Practical examination (CN18/6C/PR3) – Food Service Management Practical will be conducted in the sixth semester.								
**Practical examination (CN18/6C/PR4) – Medical Nutrition Therapy Practical will be conducted in the sixth semester.								
Credits at the end of VI semesters					139			
Part V (Extension activities)					1			
Total credits					140			

The above course offered to the UG programme enriches the skills in employability, entrepreneurship + skill development, which caters the needs of the students.

SEMESTER- I

NON MAJOR ELECTIVE

ART OF INTERIOR DECORATION

TOTAL HOURS: 30 Hours

COURSE CODE: CN18/1N/ART

CREDITS: 2

L-T-P: 1-1-0

COURSE OBJECTIVES

1. To help students understand principles of design, elements of decoration, and to learn to create beautiful surroundings and interiors.
2. To gain skills in using basic principles of art in home and to select the right materials for decoration.

COURSE OUTLINE

UNIT I:

Introduction to Interior Decoration- Good taste in art, elements of design, types of design, characteristics of good design. Principles of design- harmony, balance, proportion, rhythm and emphasis (10 HOURS)

UNIT II:

Colour: qualities of colour, Prang colour chart, colour harmony, applying principles of design in colour and to create different effects and moods. (10 HOURS)

UNIT III:

Furniture- Selection and arrangement. Window treatment- types of curtains and draperies. Accessories-Types; Flower arrangement-Types; Floor decorations-Types (10 HOURS)

RECOMMENDED TEXT BOOKS

1. Seethraman P and Pannu P, *Interior design and decoration*, CBS publishers & distributors, New Delhi, 2014.
2. Khanna G, *Art of interior design*, Indica Publishers, New Delhi, 2004

JOURNALS

1. Journal of interior design
2. International journal of interior design

E-LEARNING RESOURCES:

<https://www.thespruce.com/basic-interior-design-principles-1391370>

<http://launchpadacademy.in/elements-of-interior-design->

[2/amp/#aoh=15745888091844&referrer=https%3A%2F%2Fwww.google.com& tf=From%20%251%24s](http://amp/#aoh=15745888091844&referrer=https%3A%2F%2Fwww.google.com& tf=From%20%251%24s)

COURSE OUTCOMES

CO Number	CO STATEMENT	KNOWLEDGE LEVEL
CO 1	Define the various principles of design	K1
CO 2	Apply the principles of designs in interiors	K2
CO 3	Identify and select the right type of furniture and furnishings for interior design	K3

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO6
CO1	3	1	3	3	3	3
CO2	3	1	3	3	3	3
CO3	3	1	3	3	3	3
AVERAGE	3	1	3	3	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K1,K2	A-10 X 5 marks	50	50	50

SEMESTER –II

NON MAJOR ELECTIVE

BASICS OF FOOD PRESERVATION

TOTAL HOURS: 30 Hours

COURSE CODE: CN18/2N/BFP

CREDITS: 2

L-T-P: 1-1-0

COURSE OBJECTIVES

1. To enable the students to learn the basic principles of food preservation.
2. To help the students to perceive the simple methods of preparing fruit and vegetable based preserves.

COURSE OUTLINE

- UNIT I:** **Importance and principles of food preservation**, Methods of food preservation- traditional methods- salting, pickling, drying, jugging and potting. (10 HOURS)
- UNIT II:** **Preservation as sugar concentrate**- basic principles, pectin test and setting tests. **Jam, Jelly and Marmalade**- ingredients, equipment, preparation (any2) and storage.
Fruit Juice beverage – fruit juice, syrups, squashes and cordials- ingredients, equipment, preparation (any 2) and storage (10 HOURS)
- UNIT-III:** **Vegetable preserves**- pickles, chutneys, sauces and ketchup- preparation (any 2) and storage.
Packaging materials- types and functions (10 HOURS)

RECOMMENDED TEXT BOOKS

1. Jood S and Khetarpaul N, *Food preservation*, Agrotech Publishing, Udaipur, 2002

REFERENCE BOOKS

1. Manay S and Swamy M S, *Foods: Facts and Principles*, New Age International (P) Limited, Chennai, 2005
2. Puri R, *Jam Jelly Marmalade*, Sahni Publications, New Delhi, 2004

JOURNALS

1. Journal of food processing and preservation
2. The technology of food preservation

E-LEARNING RESOURCES:

<http://ecoursesonline.iasri.res.in/mod/page/view.php?id=4037>

<https://www.britannica.com/topic/food-preservation>

<https://www.toppr.com/guides/evs/mangoes-round-the-year/food-spoilage/>

https://en.m.wikipedia.org/wiki/Food_additive

https://en.m.wikipedia.org/wiki/Food_Safety_and_Standards_Authority_of_India

COURSE OUTCOMES

CO Number	CO STATEMENT	KNOWLEDGE LEVEL
CO 1	Define the various methods of food preservation.	K1
CO 2	Identify the different types of packaging materials	K3
CO 3	Explain the simple methods of preparing fruit and vegetable based preserves	K2

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6	AVE
CO1	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3
AVERAGE	3	3	3	3	3	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K1,K2	A-10 X 5 marks	50	50	50

SEMESTER IV

NUTRITION THROUGH LIFE CYCLE

TOTAL HOURS: 105 Hours

COURSE CODE: ND18/4C/NLC// CN18/4C/NLC

CREDITS: 5

L-T-P: 4-3-0

COURSE OBJECTIVES

1. To understand the role of nutrition in the growth and development through the lifestyle.
2. To gain insight into the principles of effective meal planning.
3. To understand the nutritional needs of individuals at every stage of lifecycle.
4. To plan diets for various age groups across the lifecycle.

COURSE OUTLINE

- UNIT I:** Introduction to meal planning: Balanced diet, RDA - Food Guide Pyramid (ICMR); Food plate (USDA); Principles of meal planning – steps involved in planning a diet.
Adult: - nutritional requirements, planning balanced diets for adult men and women, promoting healthy lifestyle through holistic approach - Diet, physical activity, stress management, yoga & mediation. (25 HOURS)
- UNIT II:** **Pregnancy:** Effect of nutrition on outcome of pregnancy, physiological demands of gestation, weight gain, nutrition needs, dietary plans and dietary problems, complication of pregnancy.
Lactation: Physiology of lactation, nutritional requirements during lactation, concerns of breast feeding mother. Lactogogues. (20 HOURS)
- UNIT III:** **Infancy:** Breast feeding, complementary feeding, advantages and disadvantages, low cost complementary foods- Artificial feeding- Infant milk Substitutes. Low birth weight infants
Preschool: Growth and nutritional needs, problems in feeding patterns and food acceptance, PEM, Vitamin A. (20 HOURS)
- UNIT IV:** **School Children:** Physical development, factors affecting food needs, RDA, packed lunch. Childhood obesity;
Adolescence: Growth and development, Food Habits, nutritional requirements, Eating disorders, Nutritional Anaemia (20 HOURS)
- UNIT V:** **Old Age:** Biologic & Physiologic aspects of aging, nutritional disorders in the aged, factors affecting food selection, nutritional requirements. (20 HOURS)

RECOMMENDED TEXT BOOKS

1. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011
2. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., *Nutritive value of Indian foods*, NIN, Hyderabad, 2001

REFERENCE BOOKS

1. Sharma M, *Textbook of Nutrition*, 1st edition, CBS publishers & distributors PVT Ltd, New Delhi, 2017
2. Longvah T, Ananthan R, Bhaskar K, Venkaiah K, *Indian Food Composition Tables*, National Institute of Nutrition, 2017
3. Abraham S, *Nutrition Through Lifecycle*, 1st edition, New age international publishers, New Delhi, 2016
4. Verma P, *Food, Nutrition & Dietetics*, 1st edition, CBS publishers & distributors PVT Ltd, New Delhi, 2015
5. Edelstein S, *Lifecycle Nutrition- An evidence based approach*, 2nd edition, Jones & Bartlett learning publications, 2015,
6. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
7. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott, 2012
8. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005
9. Whitney EN and Rolfe SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002
10. Garrow JS, James WPT, Ralph A, *Human Nutrition and Dietetics* 10th edition, Churchill Livingstone, NY, 2000
11. Groff JL, Gropper SS, *Advanced Nutrition and Human Metabolism* 3rd edition, West / Wadsworth, UK. 2000
12. Cataldo, DeBruyne and Whitney, *Nutrition and Diet therapy- Principles and Practice* 5th edition, West/ Wadsworth, London. 1999
13. Gordon WM, *Perspectives in Nutrition*, 4th edition, McGraw Hill, 1999
14. Swaminathan M, *Principles of Nutrition and Dietetics*, Bappeo, Bangalore, 1995

JOURNALS

1. International journal of food, nutrition and public health
2. Indian journal of nutrition and dietetics

E-LEARNING RESOURCES

<http://vikaspedia.in/health/nutrition/dietary-guidelines-1/dietary-guideline-1>

<https://www.nhp.gov.in/healthyliving/healthy-diet>

<https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>

<http://vikaspedia.in/health/nutrition/dietary-guidelines-1/diet-for-children-and-adolescents>

<https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>

<https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

- <https://www.indi.ie/fact-sheets/fact-sheets-on-nutrition-for-older-people/509-good-nutrition-for-the-older-person.html>

COURSE OUTCOMES

CO Number	CO STATEMENT	Knowledge level
CO 1	Explain the physiological basis for nutritional needs through the human lifecycle	K1&K2
CO 2	Identify nutrition related concerns and deficiency disorders at every stage of lifecycle	K3
CO 3	Discuss appropriate dietary guidelines for various age groups	K2
CO 4	Construct and interpret diets to meet the nutritional needs across the lifecycle	K2&K3
CO 5	Relate healthy eating behaviours to general well being	K2

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
AVERAGE	3	3	3	3	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1,K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER III & IV

HUMAN NUTRITION AND NUTRITION THROUGH LIFE CYCLE PRACTICAL

TOTAL HOURS: 45 Hours

COURSE CODE: ND18/4C/PR2 // CN18/4C/PR2

CREDITS: 4

L-T-P: 0-0-3

COURSE OBJECTIVES

1. To enable students to describe selected and relevant biochemical techniques related to nutrition
2. To demonstrate practical skills necessary to conduct laboratory based tests
3. To gain knowledge in planning diets for individuals-based on physical activity levels and income group- across the life cycle.
4. To enable students to plan diets for specific deficiency states.

COURSE OUTLINE

HUMAN NUTRITION PRACTICAL

1. Quantitative Estimation of Reducing Sugar
2. Quantitative estimation of Calcium.
3. Quantitative estimation of Vitamin C.
4. Quantitative estimation of Phosphorous.
5. Quantitative estimation of Iron.
6. Assessment of BMR and Calorie requirement by factorial approach
7. Determination of Chemical Score for protein rich recipes

NUTRITION THROUGH LIFE CYCLE PRACTICAL

1. Preparation of Complementary feed.
2. Planning and preparation of diets for different activity levels and income group.
 - a) Pre-school child
 - b) School going children
 - c) Adolescents
 - d) Adult
 - e) Expectant mother
 - f) Nursing mother
 - g) Old age
3. Planning and preparation of diets (low and medium cost) for deficiency diseases-
 - a) PEM
 - b) Vitamin A deficiency
 - c) Nutritional anemia

REFERENCES

1. Nielson S, *Food Analysis Laboratory Manual*, 3rd edition, Springer International Publishing, 2017
2. Longvah T, Ananthan R, Bhaskar K, Venkaiah K, *Indian Food Composition Tables*, National Institute of Nutrition, 2017
3. Abraham S, *Nutrition Through Lifecycle*, 1st edition, New age international publishers, New Delhi, 2016
4. Cheung PCK and Mehta BM (Eds), *Handbook of Food chemistry*, 1st edition, Springer-Verlag Berlin Heidelberg, 2015
5. James CS, *Analytical chemistry of Foods*, 1st edition Springer US, 1995

JOURNALS

1. Journal of Nutrition, health and food sciences.
2. American Journal of clinical nutrition

COURSE OUTCOME

CO No	CO Statement
Human Nutrition	
CO1	Estimate the amount of specific biological macro and micro molecules
CO2	Assess the energy requirements and evaluate the quality of protein rich recipes by chemical scoring method
Nutrition Through Life cycle	
CO3	Planning and Preparing diets for individuals across the life span
CO4	Developing indigenous, value added and low cost complementary feeds
CO5	Planning and Preparing suitable and sustainable diets for deficiency diseases.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	2	2
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
AVERAGE	3	3	3	3	2.6	2.6

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

SEMESTER V

FOOD SERVICE MANAGEMENT I

TOTAL HOURS: 60 Hours

COURSE CODE: ND18/5C/FM1 // CN18/5C/FM1

CREDITS: 4

L-T-P: 3-1-0

COURSE OBJECTIVES

- ✓ To help the students to understand the various sectors of food service units
- ✓ To become skilled in planning the design for food service units
- ✓ To develop skills in quantity food purchase production, preparation and service.
- ✓ To understand the concept and principles of organization management.

COURSE OUTLINE

UNIT I:

Food Service Industry:

- a) **Sectors of Food Service Industry:** Commercial- hotels, restaurants, Popular catering- fast food, take away, franchising, leisure attractions, Transport catering, Outdoor catering. Non-Commercial-Industrial catering, welfare catering-old age homes, prisons, religious institutions and Institutional catering.
- b) **Food service systems:** Conventional, Cook chill/ Cook Freeze, Commissary and Assembly Service. (15 HOURS)

UNIT II:

Organization management:

Types of organization, Principles, Functions and Tools of management – Organization chart, Job description, Job specification, Job analysis, Work schedule, Budget and Leadership styles. (10 HOURS)

UNIT III:

Planning and Layout of physical plant: Planning and organizing of spaces: Kitchen area, storage area, service area, receiving, pre-preparation, dishwashing and garbage disposal area. Concepts of work flow and work simplification technique (10 HOURS)

UNIT IV:

Menu Planning and Standardization:

- a) **Menu:** Definition, Functions of menu, Types of menu, French classic menu sequence, writing menu, and menu display; Factors considered in menu planning. Standardization of recipes: definition, advantages, enlargement of recipes, portion control and effective use of leftovers. (15 HOURS)

UNIT V: Food Purchase and Storage:

- a) Food Purchase: Buying and Receiving methods.
- b) Food Storage: Types of storage; Maintenance of store records- Requisition slips, Order form, Stock book, Invoice, Goods received book, Inventories
- c) Computer applications in Food Service Establishments
(10 HOURS)

RECOMMENDED TEXT BOOKS

1. Sethi M and Malhan S, *Catering Management An integrated approach*, 3rd edition, New age international publishers, New Delhi, 2015
2. Sethi M, *Institutional Food Management*, 3rd edition, New age international publishers, New Delhi, 2015
3. Singaravelavan R, *Food and Beverage Service*, 1st edition, Oxford university press, 2011

REFERENCE BOOKS

1. Fossett D and Paskins P, *The theory of Hospitality and Catering*, Hodder Education, UK, 2011
2. Jaiswal P, *Food Quality and safety*, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2011
3. Bali PS, *Quantity food Production operations & Indian Cuisine*, Oxford University Press, New Delhi, 2011
4. George B and Chatterjee S, *Food and beverage Service and Management*, JAICO, 2010
5. Kalsigsis C and Thomas C, *Design and equipment for food service -A management view*, John Wiley and sons limited, 1999
6. Lillicrap DR and Cousins JA, *Food and beverage service*, 4th edition, ELBS, 1996
7. Jones, P, *Introduction to hospitality operations (An Indispensable guide to the industry)*, Cassell publications, London, 1996
8. West B, and Wood, *Food service in institutions*, New York, 1995
9. Nathaniel BS, *Catering management for hotels, restaurants, Institutions*, Sujeet publications, New Delhi, 1991
10. Jones P, *Food service operations*, Cassell publications, London, 1990

JOURNALS

1. Journal of food service management and research
2. Educational research
3. Journal of food service

E-LEARNING RESOURCES

1. <http://www.ccohs.ca/oshanswers/hsprograms/house.html>
2. <https://en.wikipedia.org/wiki/Foodservice>
3. <http://www.nfsmi.org/documentlibraryfiles/PDF/20080228031334.pdf>

COURSE OUTCOME

CO No.	CO Statement	Knowledge Level
CO1	Identify and differentiate types of food service sectors.	K1 &K4
CO2	Discuss and apply the principles of menu planning and standardisation of recipes.	K2&K3
CO3	Apply the principles and tools of management for effective administration of organisation	K3
CO4	Differentiate and apply the knowledge and skills in planning and designing layout for food service outlets	K3&K4
CO5	Apply the skills for food purchase, storage, preparation, service and maintenance of records	K3

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	3	3	3	3
CO2	3	1	3	1	3	3
CO3	3	1	3	3	3	3
CO4	3	2	3	3	3	3
CO5	3	1	3	3	3	3
AVERAGE	3	1.2	3	2.6	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation -0

Teaching Methodology

Lecture method, Power point presentation, Over Head Projector, Group discussion, Assignment, Seminar, Survey, Quiz.

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1.K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER -V

BIOMARKERS IN CLINICAL NUTRITION

TOTAL HOURS: 75 Hours

COURSE CODE: CN18/5C/BCL

CREDITS: 4

L-T-P: 4-1-0

COURSE OBJECTIVES

To enable the students

- To understand the basic metabolic processes in the body
- To learn the normal and abnormalities metabolic conditions in body
- To relate normal functioning with diseases conditions
- To diagnose diseases and to learn the diagnostic procedure for the same
- To learn about basic instrumentation used in analysis

COURSE OUTLINE

- UNIT I:** Basic concepts of instrumentation in nutrient separation and analysis, chromatography, electrophoresis and photo instrumentation-colorimeter, spectrophotometer and flame photometer. (15 HOURS)
- UNIT II:** Enzyme assays as a diagnostic tool in acute pancreatitis, liver damages, bone disorder, myocardial infarction and muscle wasting. Inborn Errors of metabolism—Phenylketonuria, Albinism, Galactosemia and Alcaptonuria (15 HOURS)
- UNIT III:** Liver function tests- basic concepts, LFT test based on bile pigment levels in blood and urine, plasma protein changes in liver diseases, differential diagnosis for jaundice. (15 HOURS)
- UNIT IV:** Basic description of kidney function tests- sugar, urea, creatinine and electrolytes in serum- creatinine clearance tests, phenol red test, serum uric acid, serum total protein, serum albumin, serum globulin, and AG ratio. (15 HOURS)
- UNIT V:** Test for Diabetes Mellitus: Fasting glucose, Postprandial glucose, IGT, OGTT, Initial glucose challenge test, HBA1C, Insulin sensitivity test, Fructosamine test (15 HOURS)

RECOMMENDED TEXT BOOKS

1. Ramasamyier S, *Handbook of Clinical Biochemistry*, 2nd Edition, World Scientific, 2011
2. Deb. A.C, *Fundamentals of Biochemistry*, 7th edition, New central book agency, Kolkata, 2001

REFERENCE BOOKS

1. Chawla R, *Practical Clinical Biochemistry Methods and Interpretations*, 1st edition, Jaypee brothers, 2014
2. Crook MA, *Clinical Biochemistry and Metabolic Medicine*, Eighth Edition, CRC Press, 2012
3. Ahmed N, *Clinical Biochemistry*, 1st edition, OUP Oxford, 2011
4. Deb. A.C, *Concepts of Biochemistry theory+ Practical*, Books and Allied Pvt Ltd, 2007
5. Talwar G.P, Srivatsa L.N and Moudgil D, *Textbook of biochemistry and human biology*, 3rd edition, Prentice hall of India Pvt Ltd, New Delhi, 2003
6. Marshall WJ, Bangert SK, *Clinical Biochemistry: Metabolic and Clinical Aspects*, 1st edition, Churchill Livingstone, 1995

JOURNALS

1. American journal of clinical nutrition
2. Journal of clinical nutrition and metabolism

E-LEARNING RESOURCES:

1. <https://www.youtube.com/watch?v=QVoicTVf4DA>
2. <https://www.youtube.com/watch?v=5nnY0aP0Xqg>
3. https://www.youtube.com/watch?v=GncU_PxVX40
4. <https://www.youtube.com/watch?v=5zj8JYdtep4>
5. <https://www.youtube.com/watch?v=tXVDY1HvrVU&t=32s>

Course outcome

S.No.	CO Statement	Knowledge level
CO1	Outline on the basic principles of various instruments used in analysis	K1
CO2	Discuss enzyme assays as diagnostic tools in diseased conditions	K2
CO3	Describe inborn errors of metabolism	K2
CO4	Apply basic concepts of liver and kidney function test in diagnosis and interpretation	K3
CO5	Examine and assess various diagnostic test in diabetes mellitus	K4&K5
CO6	Compose recent biomarkers used as diagnostic tool in nutrition	K6

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	3	3
CO3	2	2	2	2	2	2
CO4	3	3	3	3	3	3
CO5	3	2	2	3	2	2
CO6	3	3	3	3	3	3
AVERAGE	17	16	16	17	15	15

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1,K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

UNIT V:

Diseases of the liver, gall bladder, and Pancreas- Etiology, symptoms, nutritional implication and dietary management of Hepatitis, Cirrhosis, Hepatic Coma, Cholecystitis, Cholelithiasis and Pancreatitis. (15 HOURS)

RECOMMENDED TEXT BOOKS

1. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011
2. Whitney EN and Rolfes SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002

REFERENCE BOOKS

1. Elia M, Ljungqvist O, Stratton RJ, Lanham SA, *Clinical Nutrition (The Nutrition Society Textbook)*, 2nd edition, Wiley Blackwell Publishers, 2013
2. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
3. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012
4. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., *Nutritive value of Indian foods*, NIN, Hyderabad, 2010
5. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011.
6. Marian M et al., *Clinical Nutrition for surgical patients*, Jones and Bartlett Publishers, Canada, 2008
7. Joshi Y.K, *Basics of Clinical Nutrition*, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008
8. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005
9. Gibney MJ, Elia M, Ljungqvist O, *Clinical Nutrition (The Nutrition Society Textbook)* Wiley Blackwell Publishers, 2005
10. Whitney EN and Rolfes SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002
11. Guthrie H, *Introductory Nutrition*, CV Mosby Co. St. Louis, 2002
12. Williams SR, *Nutrition & Diet Therapy*, CV. Mosby St. Louis, 2001
13. Garrow et al, *Human Nutrition & Dietetics*, 10th Edition, Churchill Livingstone, 2001

JOURNALS

1. Indian journal of nutrition and dietetics
2. JAMA

E-LEARNING RESOURCES

1. www.nal.usda.gov – Food & Nutrition Information Centre.
2. www.eatright.org – American Dietetic Organisation.
3. www.nin.org- National Institute of Nutrition, Hyderabad, India
4. www.icmr.org – Indian Council for medical Research

COURSE OUTCOME

CO.NO	CO Statement	Knowledge
CO1	Recall and list the predisposing factors, symptoms of diseases and the metabolic derangements during various clinical conditions for their effective management	K1
CO2	Interpret and describe the role of specific nutrients and analyse systematically the effect of deficiency in management of diseases	K2 &K3
CO3	Implementation of skills in planning and formulate dietary recommendations appropriate to the clinical condition	K3 &K4
CO4	Analyze the biochemical parameter ,decide appropriate nutritional requirement and recommend dietary treatment	K4 &K5
CO5	Assess the nutritional status and determine effective dietary management to combat malnutriton	K5
CO6	Compile the subjective and objective assessment and administer diets to prevent and control the progression of diseases.	K6

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	2	3	3	2	2
CO4	3	3	2	2	2
CO5	3	3	3	2	3
AVERAGE	2.8	3	2.8	2.0	2.2

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY:

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1,K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER V

INTERIOR DECORATION AND HOUSEKEEPING

TOTAL HOURS: 75 Hours

COURSE CODE: ND18/5E/IDH// CN18/5E/IDH

CREDITS: 5

L-T-P: 4-1-0

COURSE OBJECTIVES

1. To gain understanding of the basic art principles and to develop aesthetic sense.
2. To learn to make good colour combinations in the interiors
3. To understand the basic principles in making effective flower arrangement.
4. To understand common housekeeping procedures and practices.

COURSE OUTLINE

UNIT I:

Art in daily living: Importance of good taste, Objectives of Interior design,

a) **Elementsofdesign:** line, shape, size, colour, texture, pattern and light; Types and characteristics of design

b) **Principlesofdesign:** harmony, balance, rhythm, proportion and emphasis (15 HOURS)

UNIT II:

a) **Colour:** Qualities of colour-hue, value, intensity; colour harmony.

b) **Flower arrangement:** Flowers for different arrangements, types of flower arrangement

c) **Lighting:** principles, types of lighting (15 HOURS)

UNIT III:

a) **Furniture:** Selection and arrangement of furniture for different rooms

b) **Furnishing materials:** types; factors considered in their selection.

c) **Floor coverings:** Selection & types- hard and soft,

d) **Window treatment:** curtains and draperies.

e) **Accessories:** Selection, types, use and care. (15 HOURS)

UNIT IV:

Organization of the housekeeping department: Importance of the housekeeping department, Layout and Organization of Housekeeping Department, qualification and personal qualities of a housekeeper; Interdepartmental co-operation (15 HOURS)

UNIT V:

Cleaning tools and equipment: cleaning agents, cleaning methods, stain removal, types of cleaning- daily, weekly and annual. Bed making Procedure; Care of public & private areas in establishments;

Linen room: plan, layout, linen control, receiving, issuing, storage of clean linen, Selection, purchase and linen hire. (15 HOURS)

RECOMMENDED TEXT BOOKS

1. Seetharaman P, Pannu P, *Interior Design and Decoration*, 1st Edition, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2015
2. Andrews S, *Textbook of Hotel Housekeeping Management & Operations*, First edition Reprint, Tata McGraw Hill Education, New Delhi, 2007

REFERENCE BOOKS

1. Raghubalan G, Raghubalan S, *Hotel Housekeeping: Operations and Management*, 3rd edition, Oxford University Press India, 2015
2. Wildhide E, *The Interior Design Directory*, 1st Edition, Quardrille Publishing Ltd, 2009
3. Khanna G, *Art of Interior Design*, 1st Edition, Indica Publishers, 2005
4. Murphy B, *Flawless Interior Decorating*, 1st Edition, McGraw Hill Publications NY, 2005

JOURNALS

1. Journal of interior design
2. Interior -Designs, architecture and culture

E-LEARNING RESOURCES <https://www.thespruce.com/basic-interior-design-principles-1391370>

<http://launchpadacademy.in/elements-of-interior-design->

<2/amp/#aoh=15745888091844&referrer=https%3A%2F%2Fwww.google.com&tf=From%20%251%24s>

<http://59.90.94.166/1Yr/home/402Fashion/paper3/unit2.pdf> <https://www.cityflowers.co.in/blog/9->

<types-popular-classic-flower-arrangement-styles/> <https://hmhub.me/housekeeping-in-other-institutions/>

COURSE OUTCOMES

CO No.	CO Statement	Knowledge Level
CO1	Outline the universality of principles and elements of design	K1
CO2	Explain the basic concepts in the selection and types of furniture, furnishings, floor coverings and accessories	K2
CO3	Apply the colour and lighting principles in designing interiors	K3
CO4	Analyse the scope of various styles of flower arrangement	K4
CO5	Discuss the importance of the housekeeping operations	K2
CO6	Manage the public and private areas in various establishments	K6

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	1	3	3
CO4	3	1	3	3	3	3
CO5	3	3	3	1	3	3
CO6	3	3	3	1	3	3
AVERAGE	3	2.7	3	2	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1,K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER VI

FOOD SERVICE MANAGEMENT II

TOTAL HOURS: 60 Hours

COURSE CODE: ND18/6C/FM2// CN18/6C/FM2

CREDITS: 3

L-T-P: 3-1-0

COURSE OBJECTIVES

- ✓ To understand the concept and principles of financial management and human resource management.
- ✓
- ✓

COURSE OUTLINE

UNIT I:

Financial Management:

- a) Elements of cost, Food cost, Labor cost and overhead cost and Break even analysis.
- b) Basic concept of Book Keeping: Transactions, Types- Single entry and Double entry system of book keeping, Book of Accounts – Journal, Ledger, subsidiary books, difference between Journal and Ledger; trial balance and balance sheet
- c) Food cost pricing: Methods of pricing and factors affecting pricing. (10 HOURS)

UNIT II:

Human Resource Management:

- a) Recruitment, Selection, Induction, Training, Supervision, Performance appraisal, Promotion, Demotion, Transfer, Retirement, Termination and Dismissal of employees.
- b) Laws Governing Food Service Establishment pertaining to employees –Labor laws (15 HOURS)

UNIT III:

Food and Beverage Service:

- a) Styles of Service: Table service/ waiter service, self-service, specialized service, assisted service and single point service.
- b) Rules for laying a table, waiting at table, Attributes of food and beverage personnel, Inter-personal skills of food and beverage personnel. (10 HOURS)

UNIT IV:

Equipment:

- a) Definition, classification- based on weight or size, order of use and mode of operation and factors considered in the selection of equipment

- b) **Pre-preparation Equipment-** Dough making machine & bread slicer, vegetable cutting machine. Cooking Equipment – Gas ranges with ovens, fryer, Rotisserie.
- c) **Holding Equipment** – Bain-marie and chafing dishes.
Service equipment- Flatware, cutlery and hollow ware.
- d) **Clearing & collection Equipment-** Electric food trolleys & clearing trolleys. Washing Equipment – electric dishwasher and Glassware washing. (15 HOURS)

UNIT V:

Hygiene and safety:

- a) Definition of hygiene, Personal hygiene, food hygiene, and environmental hygiene; Types of Pests and Pest control - Methods; Garbage disposal – Methods, HACCP.

b) Accidents -Causes and Prevention (10 HOURS)

RECOMMENDED TEXT BOOKS

1. Sethi M and Malhan S, *Catering Management An integrated approach*, 3rd edition, New age international publishers, New Delhi, 2015
2. Sethi M, *Institutional Food Management*, 3rd edition, New age international publishers, New Delhi, 2015
3. Singaravelavan R, *Food and Beverage Service*, 1st edition, Oxford university press, 2011

REFERENCE BOOKS

1. Fossett D and Paskins P, *The theory of Hospitality and Catering*, Hodder Education, UK, 2011
2. Jaiswal P, *Food Quality and safety*, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2011
3. Bali PS, *Quantity food Production operations & Indian Cuisine*, Oxford University Press, New Delhi, 2011
4. George B and Chatterjee S, *Food and beverage Service and Management*, JAICO, 2010
5. Kalsigsis C and Thomas C, *Design and equipment for food service -A management view*, John Wiley and sons limited, 1999
6. Lillicrap DR and Cousins JA, *Food and beverage service*, 4th edition, ELBS, 1996
7. Jones, P, *Introduction to hospitality operations (An Indispensable guide to the industry)*, Cassell publications, London, 1996
8. West B, and Wood, *Food service in institutions*, New York, 1995
9. Nathaniel BS, *Catering management for hotels, restaurants, Institutions*, Sujeet publications, New Delhi, 1991
10. Jones P, *Food service operations*, Cassell publications, London, 1990

JOURNALS

1. Journal of food service
2. Journal of food service business research

E-LEARNING RESOURCES

1. <http://www.ccohs.ca/oshanswers/hsprograms/house.html>
2. <https://en.wikipedia.org/wiki/Foodservice>
3. <http://www.nfsmi.org/documentlibraryfiles/PDF/20080228031334.pdf>

COURSE OUTCOME

CO No.	CO Statement	Knowledge Level
CO1	State the various styles of food and beverage services offered in food service sectors	K1
CO2	Discuss the basic technical skills, interpersonal skills and the significance of hygiene and safety in the food premises	K2
CO3	Apply the management concepts to personnel recruitment, selection, training, appraisal, book keeping and pricing methods	K3
CO4	Classify equipments and acquire knowledge on equipment selection	K2&K4
CO5	Apply knowledge and skills to become a entrepreneur in running a food service operations	K3

MAPPING -COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	3	1	3	3
CO2	3	1	3	3	3	3
CO3	3	1	3	2	3	3
CO4	3	1	3	3	3	3
CO5	1	1	3	3	3	3
AVERAGE	2.6	1	3	2.4	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10x 2 marks	50	20	100
K1.K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER VI

MEDICAL NUTRITION THERAPY II

TOTAL HOURS: 75 Hours

COURSE CODE: CN18/6C/MT2

CREDITS: 4

L-T-P: 3-2-0

COURSE OBJECTIVES

- ✓ To gain knowledge on the various physiological ,metabolic and nutritional changes that
- ✓ occur in various communicable and Non-communicable diseases conditions
To understand the etiology , classification symptoms and prevention of acute and
- ✓ chronic diseases
To assess the nutritional status to know the disease prognosis and the ways to combat the
- ✓ abnormality
To apply nutritional guidelines and principles in administering appropriate dietary
- ✓ recommendations to the subjects and improve their nutritional status
To demonstrate their professional skill obtained to alleviate the symptoms and
- ✓ nutritional deficiencies arising thereof by appropriate execution of diet.
To impart diet counseling to alleviate and cure communicable and non communicable diseases.

COURSE OUTLINE

UNIT I:

Diet in Diabetes Mellitus:

Diabetes Mellitus- Incidence and predisposing factors, symptoms, types and tests for detection, insulin and its types, Hypoglycemic agent, Dietary management of Pre-diabetes, Type I DM and Type II DM and Complications of diabetes- Acute and Long term. Glycemic Index& Glycemic Load- Definition, Low Glycemic Foods in the treatment of Diabetes (15HOURS)

UNIT II:

Diet in Cardiovascular Disorders: Incidence, etiology, symptoms, role of specific nutrients, dietary management in hypertension and atherosclerosis.

Hyperlipidemia: Definition, Classification of lipoprotein, Types of hyperlipidemia and dietary management. (15 HOURS)

UNIT III:

Diet in Renal diseases: Basic renal function - etiology, symptoms, nutritional implications and dietary treatment of Nephritis, Nephrosis and End stage Renal Disease. Dialysis: Types of dialysis, Dietary treatment for dialysis patient. Kidney transplantation: Screening of patient and donor, dietary treatment for kidney transplanted patient. Urolithiasis and Nephrolithiasis: types of stones and dietary management (20 HOURS)

UNIT IV:

Nutrition in Critical Conditions:

Diet in Burns – Definition, Classification of Burns, Metabolic alterations, Rule of nines and Dietary management in Burns

Diet in Surgery – Pre operative and Post-operative diets

(10 HOURS)

UNIT V:

Nutrition and Cancer: Etiology, Pathophysiology, Stages in carcinogenesis, Nutrients for Cancer Prevention, Medical Nutrition therapy and Nutritional impact of Cancer Treatment

Food & drug interaction: Effect of drugs on food and nutrition-nutrient absorption, nutrient metabolism and nutrient excretion, Modification of drug action by food and nutrients. (15 HOURS)

RECOMMENDED TEXT BOOKS

1. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011
2. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005.

REFERENCE BOOKS

1. Elia M, Ljungqvist O, Stratton RJ, Lanham SA, *Clinical Nutrition (The Nutrition Society Textbook)*, 2nd edition, Wiley Blackwell Publishers, 2013
2. Mahan LK, Stump SE and Raymond JL, *Krause's Food and Nutrition Care Process*, 13th Edition, Elsevier Saunders, Missouri, 2012
3. Stump SE, *Nutrition and diagnosis related care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012
4. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., *Nutritive value of Indian foods*, NIN, Hyderabad, 2010
5. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011.
6. Marian M et al., *Clinical Nutrition for surgical patients*, Jones and Bartlett Publishers, Canada, 2008
7. Joshi Y.K, *Basics of Clinical Nutrition*, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008
8. Stacy N, *William's Basic Nutrition and Diet Therapy*, 12th edition, Elsevier publications, UK, 2005
9. Gibney MJ, Elia M, Ljungqvist O, *Clinical Nutrition (The Nutrition Society Textbook)* Wiley Blackwell Publishers, 2005
10. Whitney EN and Rolfes SR, *Understanding Nutrition*, 9th edition, West/Wordsworth, 2002
11. Guthrie H, *Introductory Nutrition*, CV Mosby Co. St. Louis, 2002
12. Williams SR, *Nutrition & Diet Therapy*, CV. Mosby St. Louis, 2001
13. Garrow et al, *Human Nutrition & Dietetics*, 10th Edition, Churchill Livingstone, 2001

JOURNALS

1. Journal of clinical nutrition and dietetics
2. Nutrition in clinical practice.

E-LEARNING RESOURCES

1. www.nal.usda.gov – Food & Nutrition Information Centre.
2. www.eatright.org – American Dietetic Organisation.
3. www.nin.org- National Institute of Nutrition, Hyderabad, India
4. www.icmr.org – Indian Council for medical Research.

COURSE OUTCOME

CO.NO	CO Statement	Knowledge
CO1	Aquaint and analyse systematically the various metabolic changes in the diseased organs and understand the nutritional implications of the diseases	K1 &K2
CO2	Critically analyse the symptoms and complications of chronic disease conditions and determine the dietary intervention to be employed .	K2
CO3	Apply the knowledge base and professionally demonstrate the skill acquired in assessing the nutritional status of the individuals and evaluate the extent of deficiencies.	K3
C O4	Analyze the symptoms and biochemical parameters to understand the severity of the disease for effective administration of diet therapy	K4 &K5
CO5	Decision to execute and evaluate appropriate dietary modification in the management of the disease and its impact on the nutritional status	K5

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	2	3	3	3	2
CO3	2	3	3	3	2
CO4	3	3	3	2	3
CO5	2	3	3	2	3
AVERAGE	2.4	3	2.8	2.4	2.4

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY:

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1.K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER VI

PUBLIC HEALTH NUTRITION

TOTAL HOURS: 75 Hours

COURSE CODE: ND18/6E/PHN// CN18/6E/PHN

CREDITS: 5

L-T-P: 4-1-0

COURSE OBJECTIVES

1. To sensitize students to public health inequities of the country in terms of nutrition and its role in national development, focusing on maternal and child nutrition in keeping with sustainable development goals.
2. To create awareness of various national and international agencies involved in health and nutrition and nutritional intervention programs concerned with public health in India.
3. To learn various health indices and assessment techniques for the community and plan nutrition health education programs balancing the socio-cultural milieu.

COURSE OUTLINE

- UNIT I:** Nutrition and Health in National Development: Nutritional problems confronting our country, Sustainable Development Goals, Causes of malnutrition in India, Food and Nutrition Security, Sustainable diets, Balance between food and population growth. (15 HOURS)
- UNIT II:** Nutritional Assessment: Sampling techniques, Identification of risk groups, Methods of Assessment of Nutritional Status: Direct assessment –Anthropometry, Biochemical estimations, Clinical and Dietary assessment; Indirect Assessment- Food balance sheets and Agricultural data, Ecological parameters and Vital Health Statistics (10 HOURS)
- UNIT III:**
- a) National Nutrition Programmes to combat malnutrition: Prophylactic programs – Vitamin A, Iron & Folic acid, Iodine; Pulse Polio, Revised National Tuberculosis Control Programme- DOTS, National AIDS control Programme; ICDS, School feeding Programmes, Nutrition Intervention during Emergencies; Immunization and its importance (15 HOURS)
- b) National and International agencies in Community Nutrition: FAO, WHO, UNICEF, ICMR, ICAR, NIN,

CFTRI, MSSRF, Food & Nutrition Board, Social Welfare Boards – Central & State. (15 HOURS)

UNIT IV:

- a) **Importance of Breast feeding:** Promotion of successful breastfeeding, Government policies, Exclusive Breastfeeding, Wet nursing, Breast milk banks, IMS Act; **Weaning foods:** Planning, formulating and preparation; Importance of correct and timely weaning, low cost complementary foods
- b) **Nutrition and Infection: Relationship** (10 HOURS)

UNIT V:

- a) **Nutrition Education Program: Objectives, Planning,**
– **Role of Audio visual aids**
- b) **Recent advances in community Nutrition; Fortification and enrichment of foods** (10 HOURS)

Related Experiences:

- A) **Assessment of Nutritional status of vulnerable groups B)**
Nutrition Education Programme for vulnerable groups

RECOMMENDED TEXT BOOKS

1. ChanderVir S, Public Health Nutrition in developing countries, Part I, 1st edition, Woodhead Publishing, New Delhi, 2011.
2. Park K, Park's Textbook of preventive medicine, 2005.
3. Bamji, Textbook of Human Nutrition, Oxford publishers, New Delhi, 2010

REFERENCE BOOKS

1. ChanderVir S, Public Health Nutrition in developing countries, Part II, 1st edition, Woodhead Publishing, New Delhi, 2011
2. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010
3. Bhatt VB, *Protein Energy Malnutrition*, PeePee Publishers, New Delhi, 2008
4. Sharma N, *Child Nutrition*, 1st edition, Murarilal & sons, New Delhi, 2006
5. Gupte S, Textbook of Pediatric Nutrition, Pawaninder P Vij Publishers, New Delhi, 2006
6. Gibney MJ, Margetts BM, Kearney JM, Arab L (Ed), *Public Health Nutrition (The Nutrition Society Textbook)*, 1st edition, Wiley black well, 2004
7. WHO, The Management of Nutrition in Major Emergencies, AITBS Publishers, New Delhi, 2000
8. Sachdev HPS, Choudhary P, *Nutrition In Children – Developing Country Concerns*, BI publications, New Delhi, 1994
9. Swaminathan M, Principles of Nutrition and Dietetics, Bappeo, Bangalore, 1993
10. Young H, Nutrition in Emergencies (Practical Health Guides), 1st edition, Oxfam, 1991

JOURNALS

1. Journal of community nutrition and health
2. Journal of health, population and nutrition
3. Journal of community nutrition and health.

E-LEARNING RESOURCES

1. <https://motherchildnutrition.org/india/food-nutrition-board.htm>
2. www.nin.org- National Institute of Nutrition, Hyderabad, India
3. www.icmr.org – Indian Council for medical Research.
4. <https://motherchildnutrition.org/resources/pdf/mcn-iasc-toolkit-nutrition-in-emergency-situations.pdf>
5. http://fscluster.org/sites/default/files/documents/chapter_9_food_and_nutrition.pdf
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3148629/>

COURSE OUTCOME

CO Number	CO STATEMENT	KNOWLEDGE LEVEL
CO 1	Define and summarize the nutritional problems facing the country.	K1, K2
CO 2	Classify the causes of malnutrition in India and demonstrate knowledge of various nutrition intervention schemes and assessment techniques for the community.	K2
CO 3	Justify the role of nutrition in national development through various key health indicators and government policies	K5
CO 4	Explain breastfeeding policies of the country and to formulate low cost weaning foods using emerging trends and technologies.	K2, K6
CO 5	Plan nutrition health education programs for vulnerable sections of the community promoting sustainability, gender equity and safe health practices.	K3, K6

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
AVERAGE	3	3	3	3	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1.K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER VI

FOOD PRESERVATION

TOTAL HOURS: 75 Hours

COURSE CODE: ND18/6E/FPR // CN18/6E/FPR

CREDITS: 5

L-T-P: 4-1-0

COURSE OBJECTIVES

- ✓ To impart knowledge on food spoilage and the common causes of food spoilage
- ✓ To understand the principles of food preservation.
- ✓ To introduce the novel food processing and preservation techniques
- ✓ To study the current trends in food packaging
- ✓ To create awareness about the food safety laws pertaining to processing and packaging techniques.

COURSE OUTLINE

- UNIT I:** Introduction-Importance and principles of preservation, food spoilage - causes of spoilage, spoilage of various foods and food products. (15 HOURS)
- UNIT II:** Methods of food preservation: Traditional methods-salting, pickling and drying. Preservation as sugar concentrates - Jams, Jelly, Marmalades and Preserves. Fruit Juice Beverages - Preparation and preservation. Preparation of candied fruits (15 HOURS)
- UNIT III:** Methods of food preservation: Use of high temperatures- Drying and sterilization, canning, pasteurization, Blanching Use of Low temperatures - Refrigeration and freezing, Irradiation (15 HOURS)
- UNIT IV:** Food additives – definition, uses of additives, characteristics of chemical additives, intentional food additives, permitted amounts; Food standards –BIS,AGMARK, FSSAI 2006. Food adulteration – types of adulterants, intentional adulterants, incidental adulterants. (15 HOURS)
- UNIT V:** Convenience foods – processing & preservation techniques - ready-to-cook, ready-to-use, ready-to serve and ready-to-eat.

Packaging: Functions of Packaging, packing materials and forms, special packaging - military and space foods and intelligent packaging. (15 HOURS)

RECOMMENDED TEXTBOOKS

1. Sivasankar B, *Food Processing and Preservation*, Prentice Hall of India (P) Ltd, New Delhi, 2008
2. Jood S and Khetarpaul N, *Food Preservation*, Agro Tech Publishing Academy, Udaipur, 2002

REFERENCES

1. Manay SN, Swamy MS, *Food Facts and Principles*, 3rd edition, New Age International (P) Ltd, New Delhi, 2008
2. Khetarpaul N, *Food Processing and Preservation*, Daya Publishing House, New Delhi, 2005
3. Hausner A, *Preserved Foods and Sweetmeats*, Biotech Books, New Delhi, 2005
4. Puri R, *Jam Jelly Marmalade*, Sahni Publications, New Delhi, 2004
5. Srivatsava RP and Sanjeevkumar, *Fruit and vegetable preservation: Principles and Practices*, Revised third edition, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2002
6. Subbulakshmi G, Udipi SA, *Food Processing and Preservation*, New Age International (P) Ltd, Publishers, New Delhi, 2001
7. NIIR BOARD, *Manual of Modern Technology on Food Preservation*, Asia Pacific Business Press Inc, New Delhi.

JOURNALS

1. Journal of food processing and preservation\
2. Food preservation science

WEBSITES AND e LEARNING RESOURCES:

<https://www.youtube.com/watch?v=WWGRTSbvef0>
<https://www.youtube.com/watch?v=8va4id8BA0o>
<https://www.youtube.com/watch?v=osqfOuOs81s>
<https://www.youtube.com/watch?v=MIT5EU4U4sQ>
https://www.youtube.com/watch?v=uNKq9iIH_oE
<https://www.youtube.com/watch?v=ub-XdapCo18>

COURSE OUTCOMES

CO No.	CO Statement	Knowledge Level
CO 1	Identify the spoilage in fresh and processed foods and describe the physical, chemical and biological quality loss in food.	K1,K2
CO 2	Describe the methods implemented to preserve foods with desirable properties balancing social and cultural norms.	K2
CO 3	Classify and explain food additives, food adulterants and current trends in food standards related to food safety practices.	K3
CO 4	Distinguish various convenience foods processing and preservation techniques; applying emerging technologies maintaining sustainability and ecological balance.	K4
CO 5	Outline the various methods & materials in food packaging with emphasis on current technological advances.	K2

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	2	3
CO2	3	3	2	2	3	3
CO3	3	3	3	3	3	3
CO4	3	2	2	3	3	3
CO5	3	2	2	3	3	3
AVERAGE	3	2.6	2.2	2.2	2.8	3

Key: Strongly Correlated-3 Moderately Correlated-2 Weakly Correlated-1 No Correlation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-10X2 marks	50	20	100
K1.K2	B-5/8x8 marks	Not exceeding 300	40	
K2,K3	C-2/3x20 marks	Not exceeding 1500	40	

SEMESTER V & VI

FOOD SERVICE MANAGEMENT PRACTICAL

TOTAL HOURS: 45 Hours

COURSE CODE: ND18/6C/PR3// CN18/6C/PR3

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

- To help the students to understand the various sectors of food service units.
- To understand the lay out, organisation structure and the effective functioning of food service industry.
- To develop skills in quantity food purchase production, preparation and service.

COURSE OUTLINE

FOOD SERVICE MANAGEMENT I

1. Visit to sectors of food industry – any 2 commercial and non-commercial sectors.
2. Standardization of two portions of North Indian, South Indian and Chinese Cuisine.

FOOD SERVICE MANAGEMENT II

1. Quantity production of standardized North Indian, South Indian and Chinese Cuisine.

REFERENCES

1. Sethi M and Malhan S, Catering Management An Integrated Approach, 3rd edition, New age international publishers, New Delhi, 2015
2. Andrews S, *Food and Beverage Service*, 2nd edition, Tata McGraw hill publishing company limited, 2009
3. George B, *Food and Beverage Service*, 1st edition, JAICO Publishing House, 2005
4. Singaravelavan R, *Food and Beverage Service*, 1st edition, Oxford university press, 2011

COURSE OUTCOME

CO No.	CO Statement	Knowledge Level
CO1	Identify and classify various sectors of catering industry	K1&k2
CO2	Differentiate equipments, menu, styles of service, lay out, organisation structure and the food production cycle	K4
CO3	Build the skills of interpretation and report writing on industrial visits.	K3
CO4	Assess food handling and sanitary practices in the food service establishments.	K5
CO5	Formulate and Standardization of different cuisines	K6

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	2	2	3	3	3	3
CO4	3	2	3	3	3	3
CO5	3	2	3	3	3	3
AVERAGE	2.8	2.4	3	3	3	3

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY:

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers

SEMESTER V& VI

MEDICAL NUTRITION THERAPY PRACTICAL

TOTAL HOURS: 45 Hours

COURSE CODE: CN18/6C/PR4

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES

- ✓ To assess the nutritional status and decide and choose the appropriate dietary modification
- ✓ To demonstrate their understanding of the facts and ideas in identifying the nutritional implications of various diseases .
- ✓ To apply their knowledge and identify the techniques of planning, preparation and execution of therapeutic diets
- ✓ To formulate and administer appropriate dietary modifications and counseling for the patients.

MEDICAL NUTRITION THERAPY I

Menu planning using ICMR food composition tables and/or ICMR food exchange lists

1. Planning and preparing clear fluid full fluid and soft diet.
2. Planning and preparing diet for fever patient- typhoid and tuberculosis.
3. Planning and preparing diet for obesity and underweight.
4. Planning and preparing diet for diarrhea, constipation and ulcer
5. Planning and preparing diet for hepatitis and cirrhosis of liver.
6. Report on the visit to the dietary department of hospital.

MEDICAL NUTRITION THERAPY II

Menu planning using ICMR food composition tables and/or ICMR food exchange lists

1. Planning and preparing diet for Hypertension and Atherosclerosis.
2. Planning and preparing diet for Diabetes mellitus with insulin and without insulin
3. Planning and preparing diet for Gout
4. Planning and preparing diet for Nephritis, Nephrosis and ESRD with dialysis
5. Planning and preparing diet for Cancer
6. Planning and preparing diet in Burns
7. Presentation of two case study done in hospital internship (15 days Internship to be done before the completion of II year in a teaching hospital)

REFERENCES

1. Stump SE, *Nutrition And Diagnosis Related Care*, 7th edition, Lippincott Williams and Wilkins, Canada, 2012

2. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010
3. Srilakshmi B, *Dietetics*, sixth edition, New age Publishing Press, New Delhi, 2011.
4. Marian M et al., *Clinical Nutrition for surgical patients*, Jones and Bartlett Publishers, Canada, 2008
5. Joshi Y.K, *Basics of Clinical Nutrition*, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008

COURSE OUTCOME

CO.NO	CO Statement	Knowledge
CO1	Understand the nutritional implications of the diseases	K1 &K2
CO2	Determine the dietary intervention to be employed	K2
CO3	Apply the knowledge base and professionally demonstrate the skill to evaluate the extent of deficiencies.	K3
CO4	Analyze the symptoms and biochemical parameters for effective administration of diet therapy	K4 &K5
CO5	Decision to execute appropriate dietary modification	K5

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOMES

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	2
CO2	3	3	3	2	3
CO3	2	2	3	3	2
CO4	2	2	3	2	3
CO5	2	3	3	2	3
AVERAGE	2.4	2.6	2.8	2.4	2.6

Key: Strongly Corelated-3 Moderately Corelated-2 Weakly Corelated-1 No Corelation-0

TEACHING METHODOLOGY

1. Lecture (Chalk and Talk-OHP-LCD)
2. Flipped Learning/Blended Classroom-E Content, Videos
3. Problem Solving-Group Discussion-Role Modelling
4. Quiz-Seminar
5. Peer Learning
6. Field Visits
7. Self-Study Papers