

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(AUTONOMOUS)**  
**WOMEN'S STUDY CENTRE**  
**DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Under Credit and Semester System**  
**(2016 Admission Onwards)**

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**PREAMBLE**

**Master's Programme in Clinical Nutrition and Dietetics** is a 4 semester full time program with six months registered dietician training. An ultimate aim of the programme is to produce competent professionals who deeply understand the essence of nutrition which allows them to personalize information rather than follow every guideline issued for an entire population. The overall content, organization, and features remain, but, within this framework, key topics and issues are updated with the newest information available. Learning nutrition can be exciting and engaging. Clinical Nutrition takes students on a fascinating journey beginning with curiosity and ending with a solid knowledge base and a healthy dose of skepticism. Our goal is to develop sophisticated consumers who have information of both nutrients and nutrition. The programme also focuses on the current trends in nutrition to match with the pace of the fast changing subject. This programme emphasizes the key areas of knowledge that must be understood and also the key points of critical thought that must accompany the acquisition of this knowledge. It covers nutritional support, ethics and other aspects on scientific bases. The course emphasizes the role of nutrition as a major modifiable factor in community health and the preventive, promotive and curative role of diet in health.

Electives provide add on knowledge which assist in their professional endeavour. The program is designed with theory papers, practicals, project and internship that provide firsthand experience empowering students to be successful professionals.

## GRADUATE ATTRIBUTES

After completing **Master's Programme in Clinical Nutrition and Dietetics** the following attributes will be fulfilled:

- Equip with latest knowledge in the respective science.
- Create competitive nutritionists in various fields like space nutrition, sports nutrition and food companies.
- Socially committed nutritional educators in various institutions.
- Gain knowledge on hospital management
- Train on innovative recipe development considering the science of food
- Develop feasible solutions against major nutrition related health issues in the country.
- Gain a deeper understanding of critical conditions and treatment routines
- Familiarise with advancements in the field of dietary therapy
- Understand the wider horizons of nutrition as a part of palliative care
- Apply the basics and knowledge incurred in various conditions like sports, space nutrition etc
- Understand the nutrients in terms of changes during digestion, absorption etc..
- Familiarise with biochemical aspects in clinical context
- Develop an understanding of biochemical analysis
- Cultivate awareness on newer developments in food technology
- Systematic knowledge in statistical analysis
- Inculcate interest in basic accounting and book keeping.
- Equip and inculcate an interest for research in the field of nutrition.
- Proficiency in life style disease management.
- Develop confidence to handle classes in community through project
- Give opportunity for job experience through hospital internships
- Acquaint with knowledge on emergency life support.
- Independent to access, analyse and plan nutritional management for disease, physiological conditions and special condition
- Inculcate interest in food technology and quality control
- Open a window towards food microbiology and preservation
- Equip students with speculative knowledge for Registered Dietician exam
- Bring about all round personality development through yoga
- Train the students the importance of good nutrition in combating the ill effects of metabolic alterations
- Develop deep knowledge about the role of therapeutic nutrition in the diseased conditions of vulnerable groups
- Nurture knowledge about the significance of fitness and exercise

## OBJECTIVES

### **End of First Semester**

On completing the first semester the students will develop thorough knowledge on physiology of human body and the nutritional demands during the various stages of life cycle. They are also taught structure, composition and functions of both macro and micro nutrients. Attain knowledge on the basics of planning and preparing menu for the various life cycles. Basics in research methodology also instill a spark for research in the students.

### **End of Second Semester**

At the end of the second semester the students are trained in detailed modifications in therapeutic conditions there by understand the requirement of diet modifications during times of disease or illness. Equipped with the appropriate skill and attitudes for nutritional diagnostic therapy and counselling services for the purpose of disease management. They also attain knowledge on food science and technology. The courses in the semester also cover conditions requiring critical care.

### **End of Third Semester**

On completing the third semester the students are equipped with skills in hospital management and also trained in statistical analysis. The knowledge gained during the earlier semesters help in applying the same for conditions requiring nutritional modifications. Basic knowledge in pharmacology also helps the students understand the interrelations between drugs and diet.

### **End of Fourth Semester**

On culmination of the program the students are equipped with skill in conducting community programs. The students are made aware of the various public health issues, national and international nutrition intervention schemes. Knowledge in various electives that assist in their job nature is also provided. The hospital internship also opens the practical knowledge for being successful professionals. The project done in the final semester also evokes the research in the beneficiaries to give innovative advancements in the field of dietetics molding them to be effective dietetic professionals.

## **STRUCTURE OF MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

Master's Programme in Clinical Nutrition and Dietetics shall be a 4 semester full time programme extending to two academic years consisting of 90 working days of instruction each semester and six months registered dietician training.

### **Theory**

The Master's Programme contains 14 compulsory core courses and 1 elective. All theory courses have 4 credits.

### **Practical**

The programme consists of four practicals, one in each semester. Practical in first and second semesters have 2 credits. Practical in third semester has 4 credits. Community programme in the fourth semester has 4 credits.

- Community Programme: During the 4<sup>th</sup> semester community programs have to be done among the rural population. It includes survey to assess the prevalence rate of disease and nutrition education program which includes awareness to public health issues and the need of the hour in health aspects as well as information on basic nutrition. Medical camps will have to be arranged according to the need. Visual aids will have to be prepared and a project report will have to be submitted.

### **Thesis Comprehensive Viva Voce and Internship**

The thesis is in fourth semester and Registered Dietitian (RD) internship after fourth semester. Each carries 4 credits.

- Thesis: Each student has to do a project on any nutrition related topics applying all aspects of research methodology.
- Hospital Internship: After the end of fourth semester students should do registered dietician training in a multispeciality hospital for six months.

### **Course Code**

Every course in the programme should be coded according to the following criteria. The course code likes this ND1C01TM. The first two letters of the code indicate the programme i.e. ND for Clinical Nutrition and Dietetics. 1 digit to indicate the semester, i.e. ND1 (Clinical Nutrition and Dietetics, 1<sup>st</sup> semester). 'C' or 'EA' for core and elective course respectively. Two digits for the course number, i.e. ND1C01 (first core course), 'T' or 'P' for theory or practical and three letters from MASTER'S Programme in 'M'.

## **DETAILED DISTRIBUTION OF COURSES AND CREDITS FOR**

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*Master's Programme in Clinical Nutrition and Dietetics*  
*St. Teresa's College (Autonomous), Ernakulam*

Semester	Title of the Course	No: of Hours/ week	No : of credits	Total Hours/ semester	Duration Exam	Total Marks	
						Sessionals	Finals
I	Nutrition through life cycle (T)	5	4	90	3	25	75
	Human Physiology (T)	5	4	90	3	25	75
	Nutritional Biochemistry (T)	5	4	90	3	25	75
	Research Methodology and Biostatistics (T)	5	4	90	3	25	75
	Biochemical Analysis (P)	5	2	90	3	25	75
II	Advanced Dietetics (T)	5	4	90	3	25	75
	Advanced Nutrition (T)	5	4	90	3	25	75
	Food Science and Technology (T)	5	4	90	3	25	75
	Nutrition in Critical Care (T)	5	4	90	3	25	75
	Advanced Dietetics and Critical Care (P)	5	2	90	3	25	75
III	Applied Nutrition (T)	5	4	90	3	25	75
	Hospital Management (T)	5	4	90	3	25	75
	Clinical Biochemistry (T)	5	4	90	3	25	75
	Nutritional Pharmacology (T)	4	4	72	3	25	75
	Yoga and Basic Life support (P)	6	4	108	3	100	-
IV	Food Microbiology and Quality control (T)	5	4	90	3	25	75
	Public Health Nutrition (T)	5	4	90	3	25	75
	Community Programme (P)	6	4	108	-	100	-
	<b>Electives :</b> Health and Fitness (T)	5	4	90	3	25	75
	Pediatric Nutrition (T)	5	4	90	3	25	75
	Geriatric Nutrition (T)	5	4	90	3	25	75
	Thesis	4	2	72	-	25	75
	Registered Dietician Training	-	4	-	-	25	75

**MASTER'S IN CLINICAL NUTRITION AND DIETETICS**

**SCHEME - CORE COURSE**

**Master's Programme in Clinical Nutrition and Dietetics**  
**St. Teresa's College (Autonomous), Ernakulam**

Semester	Course Code	Title of the Course	No: of hours per week	No : of Credits	Total hours/ semester	Duration Exam	Total Marks	
							Sessionals	Finals
I	ND1C01TM	Nutrition through life cycle (T)	5	4	90	3	25	75
	ND1C02TM	Human Physiology (T)	5	4	90	3	25	75
	ND1C03TM	Nutritional Biochemistry(T)	5	4	90	3	25	75
	ND1C04TM	Research Methodology and Biostatistics (T)	5	4	90	3	25	75
	ND1C05PM	Biochemical Analysis (P)	5	2	90	3	25	75
II	ND2C06TM	Advanced Dietetics (T)	5	4	90	3	25	75
	ND2C07TM	Advanced Nutrition (T)	5	4	90	3	25	75
	ND2C08TM	Food Science and Technology (T)	5	4	90	3	25	75
	ND2C09TM	Nutrition in Critical Care (T)	5	4	90	3	25	75
	ND2C10PM	Advanced Dietetics and Critical Care (P)	5	2	90	3	25	75
III	ND3C11TM	Applied Nutrition (T)	5	4	90	3	25	75
	ND3C12TM	Hospital Management and SPSS (T)	5	4	90	3	25	75
	ND3C13TM	Clinical Biochemistry (T)	5	4	90	3	25	75
	ND3C14TM	Nutritional Pharmacology (T)	4	4	72	3	25	75
	ND3C15PM	Yoga and Basic Life Support (P)	6	4	108	3	100	-
IV	ND4C16TM	Food Microbiology and Quality control (T)	5	4	90	3	25	75
	ND4C17TM	Public Health Nutrition (T)	5	4	90	3	25	75
	ND4C18PM	Community Programme (P)	6	4	108	-	100	-

Semester	Course Code	Title of the Course	No: of hours / week	No : of Credits	Total hours/ semester	Duration Exam	Total Marks	
							Sessionals	Finals
IV	ND4EA1TM	Health and Fitness (T)	5	4	90	3	25	75
	ND4EA2TM	Pediatric Nutrition (T)	5	4	90	3	25	75
	ND4EA3TM	Geriatric Nutrition (T)	5	4	90	3	25	75

**SCHEME- ELECTIVES**

**SCHEME- THESIS, COMPREHENSIVE VIVA VOCE AND INTERNSHIP**

Semester	Course Code	Title of the Course	No: of hours/ week	No : of Credits	Total hours/ semester	DurationExam	Total Marks	
							Sessionals	Finals
IV	ND4C1PRM	Thesis	4	4	72	-	25	75
		Registered Dietician Training	-	4	-	-	25	75

**DISTRIBUTION OF CREDITS**

Semester	Course	Credits	Total Credits
I	4 (T)	4 x 4 = 16	18
	1 (P)	1 x 2 = 2	
II	4 (T)	4 x 4 = 16	18
	1 (P)	1 x 2 = 2	
III	4 (T)	4 x 4 = 16	20
	1 (P)	1 x 4 = 4	
IV	3 (T)	3 x 4 = 12	20
	1 (P)	1 x 4 = 4	
	Project	1 x 4 = 4	

Semester	Course	Credits	Total Credits
After IV Semester	Registered Dietitian Internship	1 x 4 = 4	4

### **EVALUATION**

The evaluation of each course shall contain two parts such as Sessionals and Final. The ratio between Sessional evaluation and Final evaluation shall be 25:75. The Sessionals and Final examinations shall be evaluated using marks.

#### **Assessment Pattern**

<b>Item</b>	<b>Percentage</b>
Sessional Assessment	25
Final Assessment	75

#### **a. Sessional Assessment**

Sessional evaluation is to be done by continuous assessments. The components of the sessional for theory and practical and their marks are as below:

#### **Theory**

<b>Components</b>	<b>Marks</b>
Attendance	5
Assignment	5
Seminar	5
Test papers	10
<b>Total</b>	<b>25</b>

#### **Attendance**

<b>Percentage of attendance</b>	<b>Marks</b>
90 and above	5
85-89	4
80-84	3
75-79	2
75	-

\*Attendance below 75 will not be permitted for writing the examination

#### **Assignments and Seminar:**

Each student has to take 1 assignment and 1 seminar presentation per course.



**Different components for the evaluation of Assignment**

<b>Components</b>	<b>Marks Weights</b>
Punctuality	1
Content	2
Conclusion	1
Reference	1
<b>Total</b>	<b>5</b>

**Different components for the evaluation of Seminar**

<b>Components</b>	<b>Marks</b>
Visual Aids used	1
Content	2
Presentation	1
Reference	1
<b>Total</b>	<b>5</b>

**Practical**

<b>Component</b>	<b>Marks</b>
Attendance	5
Laboratory involvement	5
Record	5
Menu Plan	10
<b>Total</b>	<b>25</b>

**Attendance and Laboratory involvement**

<b>Attendance</b>	<b>Laboratory involvement</b>
Same as shown in theory internal	Handling Equipments
	Personal and cooking hygiene
	Skill in preparation

**Yoga and Basic Life Support (Practical)**

This course is practical oriented and hence only sessional assessment will be conducted.

### **Community Programme**

The break up for internal evaluation of Project work (Community Programme) is as follows:

<b>Component</b>	<b>Marks</b>
Presentation	40
Innovation in education methods	20
Team work	10
Report	30
<b>Total</b>	<b>100</b>

### **Thesis**

The break up for internal evaluation of thesis is as follows:

<b>Component</b>	<b>Marks</b>
Punctuality	5
Presentation	10
Report	10
<b>Total</b>	<b>25</b>

### **b. Final Assessment**

#### **PATTERN OF QUESTION PAPER FOR EXTERNAL EXAMINATION**

Each theory question paper contains 3 parts: Part A, Part B and Part C

#### **PART A**

5 questions of 3marks each out of 7 (5x3=15)

#### **PART B**

6 questions of 5 marks each out of 9 (6x5=30)

#### **PART C**

2 questions of 15 marks each out of 4 (2x15=30)

The pass minimum for each paper will be 40 marks (out of 100) with a separate minimum of 30 marks out of 75 marks for final examinations and 10 out of 25 marks for sessional examinations

#### **Examinations (Practical):**

The examinations for the practical core courses shall be conducted at the end of each semester by the external and internal examiners appointed.

The marks allotted for the valuation of Biochemical Analysis practical exam (Semester I) is as follows:

<b>Components</b>	<b>Marks</b>
Principle	15
Procedure	40
Calculation	10
Record	10
<b>Total</b>	<b>75</b>

The marks allotted for the valuation of Advanced Dietetics and Critical Care practical exam (Semester II) is as follows:

<b>Components</b>	<b>Marks</b>
Menu	15
Preparation	40
Calculation	10
Record	10
<b>Total</b>	<b>75</b>

**Thesis**

Thesis viva voce of maximum marks 75 will be conducted at the end of fourth semester.

**Registered Dietician Training (6 months)**

The break up for sessional evaluation of hospital internship and final evaluation (hospital authorities) is as follows:

**Sessional Assessment**

**Final Assessment**

**COMPUTATION OF CCPA**

Grade and Grade Point is given to each course based on the percentage of marks obtained as follows:

<b>Components</b>	<b>Marks</b>
Punctuality	10
Initiative	10
Performance	25
Assignment and Seminar	15
Report	15
<b>Total</b>	<b>75</b>

<b>Percentage of Marks</b>	<b>Grade</b>	<b>Grade Point</b>
90 and above	A+ - Outstanding	10
80-89	A – Excellent	9
70-79	B - Very Good	8
60-69	C – Good	7

50-59	D – Satisfactory	6
40-49	E – Adequate	5
Below 40	F – Failure	4

\*Note: Decimal are to be rounded to the next whole number

### CREDIT POINT AND CREDIT POINT AVERAGE

**Credit Point (CP)** of a course is calculated using the formula

**$CP = C \times GP$ , where  $C = \text{Credit for the course}$ ;  $GP = \text{Grade point}$**

Semester Credit Point Average (SCPA) is calculated as

$$SCPA = \frac{\text{Total Credit Points (TCP)}}{\text{Total Credits (TC)}}$$

*where TCP = Total Credit Point; TC = Total Credit*

Grades for the different semesters / programme are given based on the corresponding SCPA on a 7-point scale as shown below:

SCPA	Grade
Above 9	A+ - Outstanding
Above 8, but below or equal to 9	A – Excellent
Above 7, but below or equal to 8	B -Very Good
Above 6, but below or equal to 7	C – Good
Above 5, but below or equal to 6	D - Satisfactory
Above 4, but below or equal to 5	E – Adequate
4 or below	F – Failure

Cumulative Credit Point Average for the programme is calculated as follows:

$$CCPA = \frac{(TCP)_1 + (TCP)_2 + \dots + (TCP)_6}{TC_1 + TC_2 + \dots + TC_6}$$

where  $TCP_1, \dots, TCP_6$  are the **Total Credit Points** in each semester and  $TC_1, \dots, TC_6$  are the **Total Credits** in each semester

Note: A separate minimum of **40% marks** each for Sessionals and Finals (for both theory and practical) is required for the pass of a course. For pass in a programme, a separate minimum of Grade E is required for all the individual courses. If a candidate secures **F** Grade for any one of the courses offered in a Semester/Programme only **F** grade will be awarded for that Semester/Programme until he/she improves this to **E** grade or above within the permitted period.



# Syllabi for Core Courses

**ND1C01TM NUTRITION THROUGH LIFE CYCLE (T)**  
**(CORE COURSE 1)**  
**Semester I**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** To enlighten the students on the basic of nutrition. The course enlightens on the various stages of human life and also understands the nutritional requirement during various stages.

**Course Overview and Context**

- Understand various changes during life cycles
- Gain knowledge on the significance of nutrients in each stage of life

- Learn basic s of balanced diet as per need

### **Syllabus Content**

#### **Module I: Infancy (14 Hours)**

Growth and development, nutritional requirements. Feeding pattern, breast feeding and artificial feeding. Compositional differences between human milk and cow's milk. Composition of pre-term milk, Milk substitutes and their suitability for infant feeding. Weaning, need for weaning and types of supplementary foods, problems in weaning. Nutritional assessment. Nutrition, feeding techniques and care for Premature/ preterm Infants. National immunization schedule and immunization chart.

#### **Module II: Preschool (12 Hours)**

Growth and development, rate of growth, assessment of growth. RDA, Nutritional requirements and dietary guidelines, nutritional problems specific to this age: Food Hypersensitivities, Growth Failure, Childhood Obesity and Eating Disorders. Role of nutrition on physical, mental development.

#### **Module III: School going and Adolescence (16 Hours)**

Growth and development, nutritional requirements: RDA, packed lunch, nutritional problems specific to this age. Physiological modifications and stages of adolescence. Eating disorders in adolescence: Bulimia nervosa, anorexia nervosa, binge eating and obesity. Preventive nutrition in adolescent girls, against cardiovascular disease, osteoporosis, diabetes, cancer. Obesity and its related stunting, importance of height to age chart.

#### **Module IV: Pregnancy (14 Hours)**

Menstrual cycle and sex steroid hormones, nutritional concerns in pre and post menopausal phase, physiological adjustments and cost of pregnancy. Nutritional requirements: RDA, Nutritional status of Indian pregnant women. Effect of malnutrition on outcome of pregnancy. Growth of foetus from conception till term, Maternal weight gain, complications of pregnancy- oligohydramnios, IUGR, PIH, eclampsia, toxemia, gestational diabetes. HIV/AIDS during pregnancy, role of Exercise and Fitness and adolescent pregnancy

#### **Module V: Lactation (14 Hours)**

Factors affecting lactation, role of hormones in lactation. Development of breast, physiology of lactation. Nutritional composition of colostrums, breast milk and efficiency of lactation. Advantages of breast feeding. Nutritional requirements: RDA and dietary modifications during lactation, lactagogues. Milk banking.

#### **Module VI : Young adults (8 Hours)**

Nutritional requirements RDA based on activity Nutritional status of Indian adult population, Reference Man and Woman.

#### **Module VII : Elderly (12 Hours)**

Changes: psychological, physiological and social. Theories of ageing. Nutritional requirements. Nutritional problems. Nutritional care, lifestyle modifications and dietary modifications in elderly.

**Competencies of the course:**

- C1) Gain knowledge on growth and development in infancy
- C2) Study the significance of breast feeding
- C3) Analyse the compositional difference between cow's milk and human milk
- C4) Understand the concept preterm milk and its importance
- C5) Gain insight on milk substitutes and their suitability
- C6) Extrapolate on weaning and its techniques
- C7) Gain knowledge on national immunization scheme and its schedules
- C8) Identify the developmental stages in preschool
- C9) Focus on the growth assessment tools in preschool
- C10) Understand the problems of preschool
- C11) Study the nutritional requirements and dietary guidelines for preschoolers
- C12) Understand the nutritional requirements in school going age group
- C13) Know the tips of packing lunch to school
- C14) Understand the physiological transition from child to adolescence
- C15) Gain insight on stages of adolescence
- C16) Attain knowledge on eating disorders in adolescence
- C17) Focus on preventive nutrition in adolescent girls
- C18) Understand the physiological adjustments in pregnancy
- C19) Study the RDA and nutritional requirements in stages of pregnancy
- C20) Analyse the effect of malnutrition on pregnancy
- C21) Study the growth of foetus from conception till term
- C22) Gain knowledge on components of maternal weight gain
- C23) Gain insight on complications of pregnancy
- C24) Learn the effect of HIV in pregnancy
- C25) Study the role of exercise and fitness towards better pregnancy term
- C26) Understand the factors affecting lactation
- C27) Learn the role of hormones in milk production and ejection
- C28) Understand the physiological modification of breast for effective lactation
- C29) Gain knowledge on composition of colostrums
- C30) Study the advantages of breast feeding
- C31) Learn difference between breast feeding and artificial feeding
- C32) Gain insight on RDA and nutritional requirements during lactation
- C33) Study on the significance of lactogogues
- C34) Understand the concept milk banking
- C35) Analyse the term RDA based on physical activity
- C36) Gain knowledge on specifications of reference man and woman in Indian context.
- C37) Understand the theories of ageing
- C38) Understand the physiological, psychological and social changes in elderly
- C39) Study the problems faced by elderly
- C40) Understand the nutritional care and life style modifications among elderly



**Learning Resources**

**References**

- 1) Ronald Ross Watson, George Grimble, Victor R. Preedy, Sherma Zibadi,(2012) "Nutrition in Infancy", Volume 1, Springer Science & Business Media Publishers.
- 2) Victor R. Preedy, (2011), " Diet and Nutrition in Palliative Care", CRC Press.
- 3) Judith Brown, Janet Isaacs, Bea Krinke, Ellen Lechtenberg, Maureen Murtaugh, (2010) "Nutrition Through the Life Cycle", Cengage Learning Publishers.
- 4) Gopalan.C, Rama Sastri, B.V, and Balasubramian, S.C, (2010), "Nutritive Value of Indian Foods", National Institute of Nutrition, ICMR,
- 5) Kathleen C. Niedert, Becky Dorner, (2004), "Nutrition Care of the Older Adult", American Dietetic Association.
- 6) Prakash S. Shetty, (2002), "Nutrition Through the Life Cycle", Royal Society of Chemistry Publishers.
- 7) Indian Council of Medical Research, Recommended Dietary Intake for Indians (2010)

**ND1C01TM NUTRITION THROUGH LIFE CYCLE (T)**

**Blue print**

Module	Hours	Mark-3	Mark-5	Marks15
		5/7	6/9	2/4
I	14	-	2	1
II	12	1	1	-
III	16	1	2	1
IV	14	1	1	1
V	14	1	2	-
VI	8	1	-	1
VII	12	2	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- I**

**Core Course-ND1C01TM NUTRITION THROUGH LIFE CYCLE**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Brief on reference man and woman in Indian context
2. Discuss 8 big allergens.
3. What are factors considered before planning menu for old age?
4. Brief on anorexia nervosa.

5. Write the RDA of energy, protein, fat, Ca, Vit A for a lactating woman
6. Brief on components of weight gain in pregnancy.
7. Brief on "Theories of ageing"

(5 x 3 = 15 marks)

### **Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Write a note on dietary modifications in old age with reasons.
9. Discuss advantages of breast feeding.
10. Write on stages of adolescence and physiological changes.
11. Discuss the term weaning and types of supplementary feeds.
12. Write on nutritional problems in preschoolers.
13. Discuss role of hormones in lactation and factors affecting the same
14. Brief on effect of HIV on pregnancy
15. Discuss points to remember while preparing packed lunch
16. Elaborate on pre term babies, their feeding techniques and care pattern

(6 x 5 = 30 marks)

### **Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Discuss complications and nutritional requirements for pregnant woman.
18. Elaborate on nutritional assessment among preschoolers and also elaborate on Nation Immunization schedule.
19. Write the RDA for school going and adolescence. Justify the difference in nutrient requirement.
20. Discuss the RDA for young adult based on physical activity. Write on factors contributing to malnutrition and its management among stone cutters.

(2 x 15 = 30 marks)

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## **ND1C02TM Human Physiology (T)** **(CORE COURSE 2)** **Semester I**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** To provide an ideal cornerstone for students perusing studies in human physiology. To educate students about the spans of life from molecular and cellular to the organ and body system level. The course provides greater insight into body functions and basis of many common dysfunctions

### **Course Overview and Context**

- Gain thorough knowledge about basic body structure
- Analyse the functions and abnormalities of various systems of body
- Understand the neutralizing processes in the body

- Achieve knowledge about various working processes in the body

### **Syllabus Content**

#### **Module 1 : Cell and Tissue Protein (6 Hours)**

Structure of cell, cell injuries- Etiology and pathogenesis, Reversible and irreversible cell injury: Types, Sequential changes, Cellular swellings, Hyaline changes, Mucoïd changes. Types of Necrosis and Gangrene, Autolysis. Tissue protein- Collagen- synthesis, functions and degradation, Muscle proteins- Actin and myosin, Functions of Elastin and Lens protein.

#### **Module II: Body Fluids (10 Hours)**

Blood-Composition and functions, plasma proteins, erythrocytes, structure of haemoglobin, leucocytes/WBC- functions and Platelets, blood groups, blood coagulation and clotting factors, blood transfusion and blood banks. Lymphatic system, Buffers- buffer capacity, buffers in body fluids- Bicarbonates, Phosphates, and Proteins, Other body fluids – Cerebrospinal fluid, Aqueous humor, Amniotic fluid.

#### **Module III: Endocrine System (10 Hours)**

Classification, Mechanisms of hormone regulation, Alteration of hormonal regulation, functions, actions and abnormalities of- Thyroid, Parathyroid, Pituitary, Pancreas, Adrenal cortex and medulla.

#### **Module IV: Circulatory system (12 Hours)**

Heart structure and functions, CV system, anatomy, cardiac cycle, heart sounds, heart rate and regulation, blood pressure- measurements and mechanism of maintenance of B.P, hemorrhage- compensatory changes, cardiovascular modifications during exercise, oedema, causes and types.

#### **Module V: Respiratory system (10 Hours)**

Anatomy of the respiratory system, process of respiration, transport and exchange of oxygen and carbon dioxide in the body and different pulmonary volumes.

#### **Module VI: Digestive system (12 Hours)**

Anatomy of digestive tract and process of digestion, absorption and assimilation of food, composition and functions and mechanism of secretion of digestive juices and accessory organs and glands- salivary, gastric, liver, gall bladder, intestine and pancreas, functions of bile salts, movements of stomach, small intestine, villi and defecation.

#### **Module VII : Excretory system (10 Hours)**

Structure and function of kidney, structure of nephron, GFR, stages of urine formation, selective reabsorption of different constituents and factors affecting urine volume, composition of urine and micturition, Renin- Angiotensin system

**Module VIII : Reproductive system (10 Hours)**

Anatomy of male reproductive system, anatomy of female reproductive system, menstrual cycle- conception, contraception and parturition. Brief anatomy of mammary gland

**Module IX : Nervous system (10 Hours)**

Anatomy and physiology, structure of neurons, nerve cell as a conducting tissue, transmission of nerve impulses, mechanism of impulse transmission, synaptic transmission and its affecting factors, various types of receptors and reflex action and arc.

**Competencies of the course:**

- C1) Analyse the changes of cell during various conditions
- C2) Gain thorough knowledge about cells and tissues
- C3) Examine the detailed functioning of body fluids
- C4) Understand the effect of buffers
- C5) Study the importance of blood banking and blood transfusion.
- C6) Understand the mechanism and type of hormones
- C7) Learn the abnormalities of hormones
- C8) Study the comprehensive physiology of circulatory system
- C9) Study the significance and changes of blood pressure
- C10) Understand the anatomical functioning of respiratory system
- C11) Achieve knowledge about the process of digestion
- C12) Analyse the significances of digestive juices in digestion
- C13) Understand the process of micturiation
- C14) Study formation of urine
- C15) Gain knowledge about the structure of renal system
- C16) Learn the importance of Renin-Angiotensin mechanism
- C17) Study the anatomy of male reproductive system
- C18) Be able to differentiate between male and female reproductive system
- C19) Study the details of menstrual cycle
- C20) Familiarise the processes contraception and parturition
- C21) Gain knowledge on the anatomy of mammary gland
- C22) Recognize nerve and synaptic transmission
- C23) Gain meticulous knowledge of reflex arc
- C24) Identify the role of various receptors

**Learning Resources**

**References**

- 1) Lauralee Sherwood, (2015), "Human Physiology: From Cells to Systems", Cengage Learning.
- 2) Sembulingam. K, Prema Sembulingam, (2012), "Essentials of Medical Physiology", JP Medical Ltd.
- 3) Chandra Sekar C.N,(2007), "Manipal Manuel of Physiology", 1<sup>st</sup> Edition, CBS Publishers and Distributors, New Delhi.
- 4) Chatterjee C.C(2005), "Human Physiology", 11<sup>th</sup> Edition(Reprint),Vol 1& II Medical Allied Agency, Kolkata.
- 5) Khurana, Indu, (2005), "Textbook Of Medical Physiology", Elsevier India.

- 6) RatanVidya, (2004), "Handbook of Human Physiology", 7<sup>th</sup> Edition (Reprint), Jaypee Bros Medical Publishers (P) Ltd, New Delhi

**ND1C02TM Human Physiology**

Blue print

<b>Modules</b>	<b>Hours</b>	<b>Mark-3 5/7</b>	<b>Mark-5 6/9</b>	<b>Marks15 2/4</b>
I	6	1	1	-
II	10	1	1	-
III	10	-	1	-
IV	12	1	1	1
V	10	1	1	-
VI	12	1	1	1
VII	10	1	1	1
VIII	10	-	1	1
IX	10	1	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- I**

**Core Course – ND1C02TM Human Physiology**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Discuss the structure of muscle proteins
2. Explain GFR
3. How does carbon dioxide transported in the body?
4. Brief on reflex arc.
5. State the role of pancreas in digestion
6. What is buffer? Write the functioning of one buffer in the body
7. Write a brief note on heart sounds.

(5 x 3 = 15 marks)

**Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Write a note on synthesis, functions and degradation of collagen.
9. Discuss the functions of different glands in digestion.
10. Write a note on the structure of nephron.
11. Explain the abnormalities of thyroid hormone.
12. Define blood grouping. How does blood coagulation occur?
13. Describe the transport and exchange of gases.
14. Write on various receptors and their characteristics.
15. Discuss role of sexual hormones in female body.
16. Brief on cardiac changes during exercise.

(6 x 5 = 30 marks)

**Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Explain cardiac cycle. Write the role of special junctional tissues during heart beat
18. Explain the structure of digestive system. Discuss major digestive secretions and their involvement in digestion
19. How does urine synthesised in the body? Write the composition and characteristics of urine
20. Write the structure of female reproductive system. Explain the process of parturition.

(2 x 15 = 30 marks)

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**ND1C03TM Nutritional Biochemistry (T)**  
**(CORE COURSE 3)**  
**Semester I**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** The present course has been designed to train the students on various

enzymes, significances of macronutrients metabolism and the effect on various body functions. This course gives expertise to the students regarding energy production and genetic nature of a human body.

#### **Course Overview and Context**

- Attain thorough familiarity to the metabolism of macronutrients
- Analyse the role of micronutrients on macronutrients metabolism
- Unfold the enigmas of detoxification in the human body
- Scrutinize the production pathways of energy and various nucleic acids.

#### **Syllabus Content**

##### **Module I : Enzymology (10 Hours)**

Nomenclature and classification of enzymes and co – enzymes, Specificity of enzymes. Mechanism of enzyme action, Activation energy, Factors affecting enzyme activity, Enzyme inhibition, Role of different co – enzymes in metabolism, Isozymes, Enzymes in clinical diagnosis.

##### **Module II : Carbohydrate Metabolism (16 Hours)**

Chemistry of Carbohydrates: Structure and classification, Isomerism and properties of Monosaccharides, Oligosaccharides and Polysaccharides  
Metabolism of Carbohydrates: Intestinal transport of carbohydrates, Transport of glucose across various cells, Utilization of absorbed carbohydrate, Catabolic pathways of glucose and their regulation and significances- Glycolysis, oxidation of pyruvate, TCA cycle, HMP shunt, Glycogenesis, Anabolic pathways of glucose- Glycogenolysis, gluconeogenesis and major substrates involved, Uronic acid pathway, Metabolism of Galactose and Fructose, Metabolism of alcohol, Regulation of blood glucose level

##### **Module III : Lipid Metabolism (14 Hours)**

Chemistry of Lipids- Structure, classification and properties  
Metabolism of Lipids: Oxidation of fatty acids- $\beta$ , $\alpha$ ,  $\omega$  and peroxisomal oxidation of fatty acids, oxidation of MUFA and PUFA, De Novo synthesis of fatty acids, synthesis of triacylglycerides, role of liver in fat metabolism, Biosynthesis of cholesterol and bile acid formation, enterohepatic circulation.

##### **Module IV : Protein Metabolism (18 Hours)**

Chemistry of Protein: Structure, classification and properties. Metabolism of Protein: transamination, deamination, transdeamination, transmethylation, oxidative and non-oxidative deamination, Urea cycle, one carbon metabolism, biosynthesis of nonessential aminoacids- Glycine, Serine, Alanine, Threonine, Methionine, Cysteine, Glutamic acid, Tyrosine, production of specialized compounds from amino acids- porphyrin, creatine, niacin, histamine, serotonin, catecholamines and melanin.

##### **Module V: Interrelationship between macronutrients metabolism (6 Hours)**

Metabolic interrelationship between adipose tissue, the liver and extra hepatic tissues. Major regulation and integration of metabolic pathways.

##### **Module VI : Nucleic acid metabolism (12 Hours)**

DNA- structure, synthesis, replication and degradation. RNA- structure of rRNA, mRNA, tRNA.

Protein synthesis- Initiation, elongation and termination, Role of different RNAs in protein synthesis, Genetic code. Nucleotide metabolism – biosynthesis and regulation of purines, metabolism of pyrimidine.

**Module VII : Bioenergetics (9 Hours)**

The concept of Gibbs free energy, exergonic and endergonic reactions, redox potential. High energy bond and key position of ATP, substrate level and oxidative phosphorylation, Electron transport chain.

**Module VIII : Xenobiotics (5 Hours)**

Phase I- oxidation, reduction and hydrolysis

Phase II- Conjugating agents-Glucuronic acid, Sulfate, Cysteine, Glutathione, Acetylation, Glycine

Phase III reactions

**Competencies of the course:**

- C1) Comprehend the role of enzymes on different metabolism
- C2) Evaluate the coenzymatic functions of nutrients.
- C3) Pinpoint the pathways of carbohydrate metabolism.
- C4) Achieve knowledge about the utilization of fat in various conditions
- C5) Get an idea about role of prostaglandins and phospholipids
- C6) Recognize the uses of various proteins
- C7) Explain the significance of cholesterol and bile acid
- C8) Extrapolate the impact of amino acid pool.
- C9) Recognize the synthesis of special compounds from proteins
- C10) Analyse the chemistry and classification of amino acids
- C11) Realize the importance of protein synthesis and genetic code
- C12) Ascertain the relation between the macronutrients
- C13) Analyse the differentiation of different phosphorylations
- C14) Achieve knowledge about energy production and respiration chain
- C15) Attain knowledge on nucleic acid metabolism
- C16) Analyse the distinction between exergonic and endergonic reactions
- C17) Familiarize the effect of xenobiotics in the body
- C18) Identify the phases of detoxification
- C19) Gain knowledge regarding the importance of anabolic reactions.
- C20) Understand the ways of utilization of macronutrients.

**Learning Resources**

**References**

- 1) John Baynes, Marek H Dominiczak (2014), “Medical Biochemistry”, Elsevier Health Sciences.
- 2) Richard A Harvey, Denise R Ferrier, (2011), “Biochemistry”, Lippincott Williams & Wilkins.
- 3) Todd A. Swanson, Sandra I. Kim, Marc J. Glucksman, (2008), “Biochemistry”, Lippincott Williams & Wilkins.



- 4) Deb A.C. (2006), Fundamentals of Biochemistry, New Central Book Agency (p) Ltd, Kolkata.
- 5) Vasudevan.D.M, Sreekumari S, (2005), Text Book of Biochemistry, Jaypee Brothers Medical Publishers(P), Ltd, New Delhi.
- 6) David A. Bender, (2003), "Nutritional Biochemistry of the Vitamins", Cambridge University Press.
- 7) Murray R.K, Garnner, D.K, Mayers, P.A, and Rodwell, V.W (2000), Harpers Biochemistry 25<sup>th</sup> Edition, Appleton and Lange, Connecticut

**ND1C03TM Nutritional Biochemistry**

Blue print

Module	Hours	Mark-3	Mark-5	Marks15
		5/6	6/9	2/4
I	10	1	2	-
II	16	1	1	1
III	14	1	1	1
IV	18	1	1	1
V	6	-	1	-
VI	12	1	1	1
VII	9	1	1	-
VIII	5	1	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- I**

**Core Course- ND1C03TM Nutritional Biochemistry**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Explain the co enzymatic role of niacin in carbohydrate metabolism.

2. Briefly explain the term xenobiotics.
3. What is transamination with a suitable example?
4. Explain degradation of MUFA?
5. What are the major salient features of DNA?
6. How is glycogenesis occurring?
7. What is exergonic reaction write an example?

(5 x 3 = 15 marks)

**Part B**

*Answer any **six** questions not exceeding **two** pages*

*Each question carries **five** marks*

8. Explain HMP shunt with its significances.
9. Discuss  $\beta$  oxidation with energetics.
10. Describe the role of mRNA in protein synthesis.
11. Explain the production and excretion of ammonia.
12. Discuss the energy production through respiratory chain
13. What are the phases of detoxification?
14. How does fat digested, absorbed and transported in the body?
15. Explain the mechanism of enzyme action and the factors affecting the same.
16. Why does fat require carbohydrates for metabolism?

(6 x 5 = 30 marks)

**Part C**

*Answer any **two** questions not exceeding **four** pages*

*Each question carries **fifteen** marks*

17. What is gluconeogenesis? Explain the pathway and the conversion of various compounds to glucose.
18. How is Denovo synthesis of fat working? How does it regulated and write the energy transaction during the process
19. Elaborate the replication process of DNA. What are the characteristics of genetic code?
20. Write in details about the following.
  - a. Melanine production
  - b. Serotonin synthesis
  - c. Functions of Glutamic acid

(2 x 15 = 30 marks)

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**ND1C04TM - Research Methodology and Biostatistics (T)**  
**(CORE COURSE 4)**  
**Semester I**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** The aim of the course is to furnish to the intellectual needs of the students who wish to proceed to higher learning and research in nutrition.

**Course Overview and Context**

- Enable the researcher to make research more scientific and meaningful.

- Contemplate comprehensive knowledge of development of research.
- Envisage the significance and relevance of research to the society.
- Provide knowledge about opportunities for research at advanced level in the various fields of research in nutrition.

### **Syllabus Content**

#### **Module 1: Foundation and Design Strategies of Scientific Research (12 Hours)**

Research Definition - Significance of Research - Objectives and characteristics of research - Types of Research - Qualities of researcher – Need for research in field of Nutrition. Descriptive studies - Correlation studies, Case studies, Cross sectional/Survey. Analytical studies - Observational studies, Cohort studies, Cross sectional studies/Survey.

#### **Module II: Research Process (8 Hours)**

Criteria for the selection of a research problem - selection and formulation of research problem - Literature survey, Formulating hypothesis - Importance and types of Hypothesis, Variables-definition, Characteristics, Types; Specifying objectives. Preparing Research Design – Importance and types of research design, Characteristics of a good Research design

#### **Module III: Methods of Sampling, Data Collection and Representation (15 Hours)**

Sampling- Definition, Characteristics of good sample, Sampling techniques, Merits and Limitations of sampling, Sampling and Non sampling errors. Sampling and survey methods and their application to public health research. Concept and Types of Data, Methods for collecting data, Research tools for data collection – Questionnaire, Schedule, Rating scale, Attitude scale, Reliability and validity. Pilot study. Organization of data, Classification and Tabulation of data- parts of table, Significance and types of data presentation- graphs, bar diagram, histogram, pie chart, pictogram, cartogram.

#### **Module IV: Scientific Writing (12 Hours)**

Meaning, definition, Characteristics and Principles, Types of scientific writing, Format of report, National and international standards, Layout of thesis / dissertation. Writing process: Parts of dissertation/ Thesis: Title, Certificate, Declaration, Acknowledgement, Introduction, Review of literature, Statement of the problem, Scope, Relevance, Objectives and Hypothesis of the study, Methodology, Results and discussion, Summary and Conclusion, Limitations and Recommendations, Abstract, Bibliography, Appendix.

#### **Module V: Research in Nutrition and Dietetics (5 Hours)**

Research possibilities in the field of nutrition and dietetics, Institutions providing Research facilities, Scholarships, Funds, Fellowships, Minor and Major project requisites. Article publication opportunities and Journals within the field of Nutrition and Dietetics. , Writing for Grants.

### **BIOSTATISTICS**

#### **Module VI: Foundation of Biostatistics (7 Hours)**

Meaning, definition, characteristics of statistics. Importance of the study of statistics, Branches of statistics, Statistics and health science. Variables and their types, Measurement scales. Measurements of central tendency, Partition values, Measures of dispersion.

**Module VII: Correlation and Regression analysis (9 Hours)**

Concept of Correlation, correlation coefficient, Karl Pearson and Rank Correlation Coefficients. Concept of Regression and significance of regression, Linear regression & regression equation.

**Module VIII: Probability and Standard Distributions (8 Hours)**

Definition of probability, conditional probability, addition and multiplication rules of probability. Binomial distribution, Poisson distribution, Normal distribution, Divergence from normality – skewness, kurtosis.

**Module IX: Testing of Hypothesis (14 Hours)**

Parameters and statistics, Statistical inference, Statistical tests, Statistical hypothesis – Simple and Composite Hypotheses, parametric and non parametric Hypotheses, Null and alternative Hypotheses. Test statistics – Sampling distribution, Standard error, Level of significance, Type 1 and Type II, Degree of freedom, Two tailed and one tailed tests, Large and small sample tests - Test for mean, Test for proportion, Testing independence of attributes -  $\chi^2$  test.

**Competencies**

- C1) Seek to contextualize its findings within the larger body of research.
- C2) Produce knowledge that is applicable outside of the research setting
- C3) Have implications for policy and project implementation.
- C4) Make research known to the global community.
- C5) Encourage the uptake of evidence-based interventions.
- C6) Pursue an in-depth original study about a topic of interest.
- C7) Good research produces results that are examinable by peers.
- C8) Explores valid and reliable methodologies that can be replicated.
- C9) Extrapolates knowledge that can be applied to real-world situations.
- C10) Improve knowledge in quantitative reasoning.

**Learning Resources**

**References**

- 1) George Argyrous (2011), "Statistics for Research: With a Guide to SPSS", SAGE Publishers, New Delhi.
- 2) Sherri Jackson (2015), "Research Methods and Statistics: A Critical Thinking Approach", Cengage Learning Publishers.
- 3) Kothari C R (2004), "Research Methodology: Methods and Techniques", New Age International (P) Limited.
- 4) Ranjit Kumar (2014), "Research Methodology: A Step-by-Step Guide for Beginners", SAGE Publishers, New Delhi.
- 5) Dr. Rajendra Kumar C, (2008), "Research Methodology", APH Publishing.

**ND1C04TM Research Methodology and Biostatistics**

Blue print

<b>Module</b>	<b>Hours</b>	<b>Mark-3</b> <b>5/7</b>	<b>Mark-5</b> <b>6/9</b>	<b>Marks15</b> <b>2/4</b>
I	12	-	1	1
II	8	1	1	-
III	15	1	2	1
IV	12	1	-	1
V	5	1	1	-
VI	7	-	1	-
VII	9	1	1	-
VIII	8	1	1	-
IX	14	1	1	1
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- I**

**Core Course- ND1C04TM Research Methodology and Biostatistics (T)**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Distinguish between a parameter and statistic.
2. Define binomial distribution and state the condition under which it holds.
3. What is meant by judgement sampling?

4. What are the minor and major project requisites?
5. Which are the different types of scientific writing?
6. Define 'Dependent' and 'Independent' variable and specify its characteristics.
7. What is regression analysis and explain the types?

(5 x 3= 15 marks)

**Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Explain the significance of Chi – square test in statistical analysis.
9. Define research process. What are the criteria in selection of a research problem?
10. Calculate the correlation coefficient from the following data sheet:  
N X = 444 N Y = 443 N X<sup>2</sup> = 19806 N Y<sup>2</sup> = 20065 N XY = 19711 n = 10
11. Write a note on partition values.
12. Discuss on research tools. Define the terms 'Reliability' and 'Validity'.
13. Explain a scatter diagram with illustration.
14. Explain on descriptive studies and analytical studies in research.
15. What do you mean by 'Writing for Grants'? What are the steps to be followed?
16. Define normal distribution and state any eight properties of normal distribution.

(6 x 5 = 30 marks)

**Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Explain in detail on parts of dissertation.
18. What is sampling? Discuss on different types of sampling methods.
19. Define research and explain the following;
  - a. Objectives of research.
  - b. Significance of research
  - c. Qualities of a good researcher.
20. A bank manager is concerned that her brands share may be unevenly distributed throughout the country. In a survey in which the country was divided into four geographical regions, a random sampling of 100 consumers in each region was surveyed, with the following results.

Region					
	NE	NW	SE	SW	Total
Purchased the brand	40	55	45	50	190
Do not purchase	60	45	55	50	210
Total	100	100	100	100	400

Develop the table of observed and expected frequencies for this problem and also  
(a) Calculate the sample  $\chi^2$  value; (b) State the null and alternative hypothesis; (c)  
at  $\alpha = 0.05$  test whether brand share is the same across four regions.

(2 x 15= 30 marks)

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**ND1C05PM Biochemical Analysis (P)**  
**(CORE COURSE 5)**  
**Semester I**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** The course enables the students to estimate the amount of macro and micro nutrients present in food stuffs.

**Course Overview and Context:**

- Enable the students to detect the presence of macro nutrients
- Learn to estimate the amount of nutrients present in the given sample

**Syllabus Content:**

**Module 1: Carbohydrate** (12 Hours)

- a. Qualitative analysis of sugars -Mono, Di and Polysaccharides

**Module II : Proteins** (12 Hours)

- a. Estimation of Proteins

b. Qualitative analysis of Amino Acids	
<b>Module III : Fat</b>	<b>(12 Hours)</b>
a. Estimation of Fat content	
<b>Module IV: Vitamins</b>	<b>(12 Hours)</b>
a. Estimation of Vitamin A, Vitamin C(titration method)	
<b>Module V: Minerals</b>	<b>(42 Hours)</b>
a. Estimation of Calcium content	
b. Estimation of Iron content	
c. Estimation of Phosphorus	
d. Estimation of Sodium	
e. Estimation of Potassium	
<b>Competencies of the course:</b>	
C1) Identify the carbohydrates	
C2) Steps of quantitative analysis of carbohydrate	
C3) Gain knowledge on protein and amino acid estimation	
C4) Understand the fat content of food	
C5) Study the estimation of vitamins	
C6) Understand the estimation procedures of minerals	

**ND1C05PM Biochemical Analysis (P)**

Blue Print

Module	Hours	Marks-15	Marks-40	Marks-10	Marks-10	Total Marks(75)
		1/1	1/1	1/1	1/1	
1	12	1	1	1	1	75
2	12					
3	12					
4	12					
5	42					

**Model Question Paper**



**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**  
**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- I**  
**Core Course-ND1C05PM Biochemical Analysis (P)**

**Time: 3 hrs**

**Max.Marks:75**

Estimate the amount of calcium present in the given sample. Write the aim, principle and procedure of the same experiment.

- |                |            |
|----------------|------------|
| 1. Principle   | (15 marks) |
| 2. Procedure   | (40 marks) |
| 3. Calculation | (10 marks) |
| 4. Record      | (10 marks) |

**ND2C06TM Advanced Dietetics (T)**  
**(CORE COURSE 6)**  
**Semester II**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/Week)**

**Aim of the course:** The course focuses on providing knowledge and developing appropriate skills and attitudes in students for medical nutritional therapy and counselling services for the purpose of disease management. It provides in-depth review on proper diet, lifestyle strategies and therapeutic nutrient intervention to correct nutritional imbalances, provide optimal health and prevent, correct and manage different medical problems.

**Course Overview and Context**

- Detailed understanding of the concept medical nutrition therapy
- Analyse different therapeutic diets, nutritional support and mode of feeding available
- Know the significance of unique and individualised nutritional therapy
- Understand the importance of team approach in therapeutic nutrition

**Syllabus Content**

**Module 1: Introduction to Medical Nutrition Therapy (8 Hours)**

Role of dietician, job specialization,

NCP- Nutritional assessment, nutritional diagnosis, nutritional intervention, nutritional monitoring and evaluation, documentation- SOAP/ Z score/ MUST/ POMR/ SGA. Routine Hospital Diet- Clear fluid, full fluid, soft and normal diet.

**Module II: Medical Nutrition therapy for Gastrointestinal Tract Disorders (12Hours)**

a) Upper Gastrointestinal tract Diseases /Disorders: Pathophysiology and Nutritional care and diet therapy in:

Diseases of oesophagus; oesophagitis, Hiatus hernia

Disorders of stomach: Dyspepsia, Gastritis, Gastro esophageal reflux disease, Peptic ulcers- Gastric and duodenal ulcers- dietary management: traditional approach and liberal approach and dumping syndrome.

b) Lower gastrointestinal tract Diseases/Disorders

Flatulence, constipation, haemorrhoids, diarrhoea,

Diseases of the large intestine: Diverticular disease, Irritable bowel syndrome, inflammatory bowel disease(ulcerative colitis, crohn's disease, short bowel syndrome)

Malabsorption Syndrome/Diseases of Small intestine - Celiac (Gluten –induced) disease, tropical sprue, intestinal brush border enzyme deficiencies- Lactose intolerance, steatorrhoea,

Principles of dietary Care: Modified fibre diets/ high residue, low residue.

**Module III: Medical Nutrition therapy for Diabetes Mellitus (10 Hours)**

Aetiology, classification, pathophysiology symptoms and diagnosis - i) Blood glucose monitoring-GTT, FBS,PPBS, RBS ii) Glycosylated hemoglobin iii) Urine testing

Management of DM, Blood sugar lowering agents- Oral hypoglycemic agents, Insulin therapy, Nutritional management- Diet planning for Type1, Type2, For Special conditions – Pregnancy, Elderly and Surgery.

Acute complications – pathophysiology, diagnosis, types, treatment - Hypoglycemia, Hyperglycemia, Ketoacidosis, Somogyi effect and Dawn phenomenon. Chronic complication - pathophysiology, diagnosis, types, and treatment – Atherosclerosis, Nephropathy, Neuropathy, Retinopathy and infections

**Module IV: Medical Nutrition therapy for Liver and Gall Bladder disease (12 Hours)**

Dietary care and management in jaundice, viral hepatitis (different types), fulminant hepatitis cirrhosis of liver, hepatic encephalopathy, Wilson's disease.

Dietary care and management in diseases of the gall bladder and pancreas- biliary dyskinesia, cholelithiasis, cholecystitis, cholecystectomy, pancreatitis- acute, chronic, Zollinger Ellison syndrome.

**Module V: Medical Nutrition therapy for Cardiovascular Diseases (10 Hours)**

Blood pressure - Regulation, Short-term (sympathetic nervous system) and long-term (kidneys) Hypertension – classification (secondary and essential) Risk Factors for hypertension, Dietary management-DASH approach.

Hyperlipidemia and Hyperlipoproteinemia- Classifications, dietary management Atherosclerosis - Etiology and understanding the pathogenesis. Coronary Heart Disease - Angina Pectoris and Myocardial Infarction - Clinical manifestation and importance of

cardiac enzymes to aid in the detection of CHD - Dietary management  
Congestive Heart Failure - Pathogenesis - Pathogenesis of sodium and water retention Risk factors, Clinical manifestation Cardiac Cachexia Treatment - Nutritional Care  
Cerebrovascular Disease and Peripheral Vascular Disease - In brief etiology and dietary care. Rheumatic and Congenital Heart Disease - Clinical manifestation, pathogenesis and nutritional care

**Module VI: Medical Nutrition therapy for Renal Diseases (12 Hours)**

GlomeruloNephritis: Etiology, characteristics Objectives, Principles of dietary treatment and management. Nephrotic Syndrome: Etiology, Objectives, Principles of dietary treatment and management

Acute Renal Disease - Causes and Dietary management, Chronic Renal Disease - Causes and Dietary management, dietary modification in chronic renal disease with complications, Sodium and Potassium Exchange list

Types of dialysis and their nutritional care – Haemodialysis, Continuous Ambulatory peritoneal dialysis

Nephrolithiasis- etiology, types of stones and nutritional care (acid and alkaline ash diet)

**Module VII :Medical Nutrition therapy for Respiratory diseases (10 Hours)**

Signs and symptoms of pulmonary disease, respiratory distress syndrome in adults and newborn, Chronic Obstructive Pulmonary Disease - Etiology and Pathogenesis, Nutritional Management.

**Module VIII: Medical Nutrition therapy for Fever and Infectious Diseases (8Hours)**

Pathophysiology of fever and infection effect of fever and infection on nutritional status and management for febrile diseases- acute-typhoid, malaria, and chronic fever-tuberculosis, poliomyelitis, AIDS.

**Module IX: Medical Nutrition therapy for Nutritional Anemias (8 Hours)**

Erythropoiesis and haemoglobin synthesis, Nutrients involved in Erythropoiesis Classifications, symptoms of Anemias and Nutritional Care.

Normocytic anemia – aplastic anemia , Megaloblastic anemia, Microcytic anemia Sickle cell anemia and Thalassemia, Hemolytic anemia

**Competencies of the course:**

- C1) Know medical nutrition therapy.
- C2) Analyse nutrition care process
- C3) Achieve knowledge regarding hospital diet
- C4) Understand various upper gastro intestinal diseases and their dietary modifications
- C5) Analyse the pathogenesis of lower gastro intestinal diseases and nutritional management.
- C6) Know dietary care of various liver diseases
- C7) Familiarize different gall bladder and pancreas diseases and their treatments
- C8) Gain knowledge about diabetes mellitus and its management

- C9) Understand the terms glycemic index and artificial sweeteners.  
 C10) Attain knowledge on various cardio vascular diseases and nutritional management  
 C11) Understand the principles of dietary management of renal diseases  
 C12) Familiarize various infections and their management.  
 C13) Understand various anaemias and role of dietetics in its treatment  
 C14) Identify the role of diet on respiratory diseases  
 C15) Focus the management processes involved in AIDS  
 C16) Analyse the process erythropoiesis.

**Learning Resources**

**References**

- 1) Anne Payne, Helen M. Barker, (2011) "Advancing Dietetics and Clinical Nutrition", Elsevier Health Sciences.
- 2) Joan Webster-Gandy, Angela Madden, Michelle Holdsworth, "Oxford Handbook of Nutrition and Dietetics", OUP Oxford.
- 3) Begum R M, (2008), "A Textbook of Foods, Nutrition & Dietetics", Sterling Publishers Pvt. Ltd.
- 4) Garrow, J.S., James, W.P.T. and Ralph, A. (2000), "Human Nutrition and Dietetics", 10th Edition, Churchill Livingstone.
- 5) Gopalan.C, Rama Sastri, B.V, and Balasubramian, S.C., (2012), "Nutritive Value of Indian Foods", NIN, ICMR.
- 6) Mahan, L.K. and Escott-Stump, S. (2000), "Krause's Food Nutrition and Diet Therapy", 10th Edition, W.B. Saunders Ltd.

**ND02C06TM Advanced Dietetics**

Blue print

<b>Module</b>	<b>Hours</b>	<b>Mark-3</b> <b>5/7</b>	<b>Mark-5</b> <b>6/9</b>	<b>Marks15</b> <b>2/4</b>
I	8	1	1	-
II	12	1	1	-
III	10	1	1	-
IV	12	1	1	1
V	10	-	1	1
VI	12	1	1	1
VII	10	-	1	-
VIII	8	1	1	1
IX	8	1	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- II**

**Core Course – ND2C06TM Advanced Dietetics**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one** page*

*Each question carries **three** marks*

1. Explain pernicious anaemia.
2. Write note on hospital diets
3. What is glycemic index?
4. Differentiate between crohn's disease and ulcerative colitis.
5. Briefly explain cholelithiasis.
6. Write a short note on haemodialysis.
7. What is the relevance of dietary management in tuberculosis?

(5 x 3 =15 marks)

**Part B**

*Answer any **six** questions not exceeding **two** pages*

*Each question carries **five** marks*

8. Write briefly on angina pectoris.
9. Hyperglycemia leads to ketoacidosis. Comment on this statement.
10. Explain the role of medical nutrition in various febrile conditions.
11. Discuss about different types of nutritional deficiency anaemia.
12. Describe both acute and chronic renal failure.
13. Dietary care and management of gall bladder diseases
14. Suggest ways of managing peptic ulcer in an IT professional.
15. Explain the term COPD and its medical nutrition management.
16. Write on nutrition care process.

(6 x 5 = 30 marks)

**Part C**

*Answer any **two** questions not exceeding **four** pages*

*Each question carries **fifteen** marks*

17. Discuss in the detail the term cirrhosis and its management procedures.
18. Explain glomerulonephritis and its dietary management.
19. Write different stages of AIDS and discuss diet.

20. Describe atherosclerosis and dietary management.

(2 x 15=30 marks)

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**ND2C07TM - Advanced Nutrition (T)**  
**(CORE COURSE 7)**  
**Semester II**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/Week)**

**Aim of the course:** To explore the essentiality of nutrients for human survival. This course gives expertise to the students regarding human body composition and the role of nutrients to maintain it healthy.

**Course Overview and Context**

- Know and understand the, importance of all nutrients present in foods.
- Know about the functions of various nutrients in the body.
- Familiarize with the recent advances in field of nutrition.
- Understand the different types of newly developed food products.
- Know about the various types of nutrients and their functions in the body.

**Syllabus Content**

**Module 1-Human Nutrient Requirements**

**(7 Hours)**

Macronutrients, methods of assessment of nutrient needs – a critical review, Critical evaluation of sensitive methods and derivations of requirements and recommended dietary allowances of macronutrients for all age groups: - Energy - Carbohydrates and dietary fibre - Proteins and amino acids - Lipids – Water, critical evaluation of National and International nutrient allowances; factors affecting the requirements.

**Module II- Body Composition (9 Hours)**

Different levels of body composition- atomic, molecular, cellular, tissue and whole body levels, body compartments, Estimation of body composition (direct and indirect methods), Body composition changes during childhood, adolescence and elderly, Status/Length, Weight, Circumference measurements, Body Mass Index, skinfold measurements, leg length.

**Module III-Energy (12 Hours)**

Components of energy requirements: BMR, RMR, thermic effect of food, physical activity. Factors affecting energy requirements, methods of measuring energy expenditure. Estimating energy requirements of individuals and groups. Regulation of energy metabolism and body weight: Control of food intake – role of leptin and other hormones.

**Module IV- Carbohydrates (8 Hours)**

Classification, occurrence and physiological functions, digestion, absorption and transport, factors influencing metabolism. Dental caries. Role of dietary fiber in health and disease. RDA, major sources.

**Module V- Lipids (8 Hours)**

Digestion, absorption and transport, classification - visible and invisible fats. MUFA, PUFA, EPA, SFA, trans fatty acid- sources and physiological functions. Role of lipoproteins, cholesterol and triglycerides in health and disease. RDA, major sources.

**Module VI- Proteins (8 Hours)**

Classification - essential and non-essential amino acids- their role in growth and development. Physiological functions of proteins. Requirements, nitrogen balance. Methods for evaluating protein quality. RDA, major sources.

**Module VII- Minerals (13 Hours)**

Macro minerals: Digestion, absorption, factors affecting absorption, transport and utilization

Calcium - Skeleton and other tissue measurement, bone mineral density, effect of diet and immobilization, calcium absorption and utilization, calcium balance, requirement, sources, deficiency and excess (toxicity).

Phosphorous - Concentration in the body, calcium -phosphorous ratio, absorption and utilization, deficiency and toxicity, interrelationship of calcium, phosphorus, vitamin D and protein.

Sodium, potassium, magnesium and sulphur - distribution, absorption, utilization, role in human nutrition, deficiency and toxicity. Electrolyte balance and acid base balance, Acidosis, Alkalosis, Anion gap

Micro Minerals: Iron - Intake, utilization, storage, iron balance, functions, deficiency and toxicity. Role of Iron in prevention of anemia, sources and RDA.

Iodine and Zinc - Physiology, functions, and sources recommended intake, deficiency and toxicity.

Fluorine -Physiology, use in the prevention of dental carries and toxic effects, sources, RDA.

Copper, molybdenum, cobalt, nickel, manganese, selenium, chromium and cadmium Physiology, sources, recommended intake, deficiency and toxicity, sources and RDA

**Module VIII- Fat Soluble Vitamins (12 Hours)**

Factors influencing the utilization of vitamins.  
 Fat soluble vitamins: A,D,E,K - History, chemistry, physiological role, digestion, absorption transport, utilization and storage, methods of assay, dietary sources, dietary losses in preparation and handling, conversion of carotene in to vitamin A in human beings, RDA, deficiency and toxicity.

**Module IX- Water Soluble Vitamins (13 hours)**

Water soluble Vitamins: B complex Thiamine, riboflavin, niacin, vitamin B<sub>12</sub>, pyridoxine, pantothenic acid, Choline, carnitine, inositol, taurine, biotin and ascorbic acid – history, chemistry, sources, physiological action, biochemical utilization, storage, transport, biosynthesis of vitamins, losses in preparation and handling, recommended intake, deficiency diagnosis and toxicity, methods of assay.

**Competencies of the course**

- C1) Achieve knowledge about the relationship between food, health and disease.
- C2) Distinguish between macronutrients and micronutrients.
- C3) Get an idea about process of digestion, absorption and utilization of nutrients in body.
- C4) Recognize the factors affecting absorption of nutrients.
- C5) Extrapolate the impact of micronutrients on macronutrients.
- C9) Explain about the RDA for different age groups.
- C7) Analyse the body compartments from atomic to system level.
- C8) Realize the importance of intake of micronutrients in diet.
- C9) Analyse the differentiation of macrominerals and microminerals.
- C10) Achieve knowledge about quality assessment of nutrients.
- C11) Attain knowledge on factors depending total energy expenditure.
- C12) Analyse the distinction between fat soluble and water soluble vitamins

**Learning Resources**

**References**

1) James L Groff and Sareen S Gropper, (2009) “Advanced Nutrition and Human Metabolism”, Fourth Edition, Wadsworth Publishing Company.

2) Hui,Y H, (2007), “ Handbook of Food Products Manufacturing” Vol. I , Wiley-Interscience, New Jersey Publishers.

3) Maurice B Shils, Moshe Shike, Mark Gathers, Ross Benjamin, Cabellero, Robert J Cousins, (2006), “Modern Nutrition in Health and Disease”, Lippincott Williams al Wilkins.

4) Michael J Gibney, Ian A Macdonald and Helen M Roche (2003) “Nutrition and Metabolism”, The Nutrition Society Textbook Series, Blackwell Publishing, First Edition.

Module	Hours	Mark 3	Mark 5	Mark 15
II	9	1	-	1
III	12	-	1	-
IV - Advanced Nutrition	8	1	1	
V	8	1	-	1
VI	8	1		-
VII	13	1	3	1
VIII	12	1	2	-
IX	13	- 40	2	1
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>



**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- II**

**Core Course- ND2C07TM - Advanced Nutrition (T)**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page**  
Each question carries **three** marks*

1. Explain the protein sparing action of carbohydrate.
2. Write briefly about the classification of proteins.
3. Give the RDA of macronutrients for different age groups.
4. Briefly explain doubly labelled water technique.
5. Explain the role of Vitamin K in blood coagulation
6. Comment on process of Fat emulsification.
7. Write a note on the functions of fluorine

(5 x 3= 15 marks)

**Part B**

*Answer any **six** questions not exceeding **two pages**  
Each question carries **five** marks*

8. Explain the beneficial effects of various types of dietary fibres.
9. Discuss the term 'antioxidant' and main explain on nutrients used as antioxidants.
10. Discuss the role of electrolytes in the body.
11. How folic acid and Vitamin B12 do become important especially during pregnancy?
12. Describe the role of Vitamin C in the body. Write the food sources and deficiency stages.
13. Explain significance of magnesium and the factors affecting the action.
14. What is meant by basal metabolism and the conditions affecting the same?
15. Explain the digestion, absorption and functions of Iron.
16. Discuss Xerophthalmia on the basis of the importance of vitamin A.

(6 x 5=30 marks)

### **Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Elaborate the role of Vitamin C in the body. Write the food sources and deficiency disease.
18. Explain about three components of total energy expenditure.
19. Discuss the digestion, absorption and transport of lipids.
20. Describe the following on iron and copper.
  - a. Functions
  - b. Absorption and transport
  - c. Related health problems and food sources.

(2 x 15=30 marks)

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### **ND2C08TM Food Science and Technology (T)** **(CORE COURSE 8)** **Semester II**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** Open the wide horizons of the science of foods. This course helps to gain information on food groups, novel foods and toxins in food. The various sources of nutrients and the functions of different food groups. Enlighten the students on the newer expansions of this science.

#### **Course Overview and Context**

- Enable the students to gain knowledge on nutritive value and properties of different foods
- Identify the changes in property during food handling
- Create awareness on recent trends and novel foods.

#### **Syllabus Content**

##### **Module I: Cereals and millets**

**(10 hours)**

Structure, properties, nutritive value. Gelatinization, Gelation, syneresis, retrogradation, dextrinization. Factors affecting gelatinization and gelation. Modified starch, resistant starch Flour mixtures – batters and dough - Leavening agents – physical, chemical and biological. Gluten formation, Gums – Functions, sources, applications. Pectic substances, pectin gels

##### **Module II: Vegetables and Fruits**

**(10 hours)**

Nutritive value, pigments, ripening and senescence. Enzymatic and non enzymatic browning reaction.

**Pulses and legumes** - Composition, processing

**Module III: Milk and Milk Products (15 hours)**

Composition of milk, properties of milk, effect of heat on milk, milk products and milk substitutes

**Meat, fish and poultry** - Composition, cooking methods, effects of cooking, Fish and sea foods Composition, changes during processing

**Eggs** -Composition, functional properties of eggs, use in cooking, egg processing, egg products.

Protein concentrates and isolates hydrolysates and texturised vegetable proteins, modified meat products, soy proteins, non-conventional sources of protein.

**Module IV: Fats, oils and sugars (8 hours)**

Properties of fats, Role of fats and oils in cooking, Fat substitutes, Fat deterioration and antioxidants, chemical degradation, oxidative and hydrolytic rancidity, effect of heat, chemical modifications of fats - Hydrogenation, trans fats. Colloidal systems, Types of food dispersions – sol, gel, emulsion and foam and applications in foods.

**Sugars** -Properties of sugars, chemical reactions –Hydrolysis, caramelization, maillard reaction. Food Applications : crystalline candies, crystallization, syrup, sauces, jams and jellies, Stages of sugar cookery, Crystallisation

**Module V: Food processing techniques (15 hours)**

Traditional Processing Methods – Drying, Salting, Sugaring, Pickling, Smoking, Fermentation, Concentration – Advantages and Disadvantages. Modern Processing techniques – Application of High temperature, Low temperature, Hydrostatic Pressure Treatment, High Voltage Pulse Technique, irradiation. Canning – Advantages and Disadvantages.

Food Packaging. Novel Methods in Food Preservation, Use of Biopreservatives: Antibiotics, Bacteriocins, Natural antimicrobials from plants.

**Module VI: Food additives (8 hours)**

Definition, Types and action of food additives – Preservatives, Antioxidants, Sequesterants, Stabilizers, Bleaching agents, Maturing agents, Aerating agents, Antistaling agents, Bodying agents, Clouding agents, Curing agents, Clarifiers, Food colours, Nutritive and Non –Nutritive Sweeteners, Surfactants , Fat replacers. Numbering system of Food additives, Acceptable Daily Intake, Health concerns.

**Module VII: Novel Foods (10 hours)**

Definition, Types and acceptability of Novel foods - SCP, leaf isolates, oil seed cakes, hydrocolloids, novel source of food colourants.

Functional foods – Fibre- Resistant starch, phytochemicals, essential oils, Natural antimicrobial compounds in foods.

Introduction, Definition, history, classification – Prebiotics, probiotics and synbiotics

Probiotics: Taxonomy and important features of probiotic micro- organisms, Health effects of probiotics including mechanism of action, Probiotics in various foods: fermented milk products, non-milk products etc, Quality Assurance of probiotics and safety.

Prebiotics-Definition, chemistry, sources, metabolism and bioavailability, effect of processing, physiological effects, effects on human health and potential applications in risk reduction of diseases, perspective for food applications of - Non-digestible carbohydrates/oligosaccharides: Dietary fibre, Resistant starch, Gums.

**Module VIII: Toxins in food (8 hours)**

Definition, Types and health hazards of Natural Toxins in foods: Pulses, cereals, nuts– Biogenic amines, Ciguatoxin Shellfish toxins, Scombrototoxin, Tetrodotoxin, Mushroom toxins, Aflatoxins, BOAA Gempylotoxin, Pyrrolizidine alkaloids, Venomous fish, Grayanotoxins, Phytohaemagglutinin, protease inhibitors, phytates.

Definition and health hazards of chemical contaminants – Heavy Metals, Pesticide residues, inferior packaging materials and adulterants.

**Module IX: New product development (6 hours)**

Definition, classification, characterization, factors shaping product development. Social concerns, health concerns and market place concerns. Process of development: ingredient characteristics, idea generation, feasibility, technique standardization, variations, product standardisation, product development, sensory evaluation, product modification, final product, label design and packing

**Competencies of the course**

- C1) Understand the structure nutritive value and composition of cereals
- C2) Familiarise with forms of starches and their benefits
- C3) Analyse the principles of sensory evaluation
- C4) Introduce and familiarise the newer foods like functional foods, pre and probiotics, novel foods
- C5) Gain knowledge on composition, processing and nutritive value of pulses
- C6) Study changes during starch cookery
- C7) List the various food preservation techniques
- C8) Distinguish between nutrient, composition of pulses, legumes, nuts and oilseeds.
- C9) Extrapolate on the anti nutritional factors in pulses, nuts and oilseeds
- C10) Study the significance of milk its composition and nutritive value
- C11) Distinguish the preparation of fermented and non fermented milk products
- C12) Understand the classification, grading and selection of meat, poultry and fish
- C13) Understand the changes post mortem in flesh foods
- C14) Identify the nutrients and role of egg in cookery
- C15) Analyse the non conventional sources of proteins
- C16) Focus on textured vegetable protein, modified proteins and protein isolates
- C17) Gain knowledge on enzymatic and non enzymatic browning reactions
- C18) Study the types of fats and oils
- C19) Enumerate the chemical changes in fats on cooking
- C20) Infer the stages of sugar cookery and its role in cooking
- C21) Familiarise with artificial sweeteners and its effects.
- C22) Attain knowledge on natural toxins in foods
- C23) Study the nutrient methods novel methods of preservation
- C24) Introduce food additives: flavouring, colouring, leavening agents, emulsifiers,

<p>stabilisers</p> <p>C25) Learn the functions and types of food additives</p> <p>C26) Disseminate food adulteration based on heavy metal and pesticides useage</p> <p>C27) Gain insight on new product development</p> <p>C28) Analyse market and promote newer products</p> <p>C29) Techniques of marketing and labeling of innovative products</p> <p>C30) Broader understanding of food science and its development due to technology</p>
<p><b>Learning Recourses</b></p> <p><b>References</b></p> <p>1) Vickie Vaclavik, Elizabeth W. Christian, (2013), “ Essentials of Food Science”, Springer Science &amp; Business Media.</p> <p>2) George Stewart, (2012), “Introduction to Food Science and Technology”, Elsevier.</p> <p>3) Geoffrey Campbell-Platt, (2011), “Food Science and Technology”, John Wiley &amp; Sons.</p> <p>4) International Food Information Service, (2009), “ IFIS Dictionary of Food Science and Technology”, John Wiley &amp; Sons.</p> <p><a href="#">Sumati Rajagopal Mudambi</a>, <a href="#">Shalini M. Rao</a>, <a href="#">M. V. Rajagopal</a>, (2006), “Food Science”, New Age International.</p>

**ND2C08TM Food Science and Technology (T)**

<b>Blue print</b>				
<b>Modules</b>	<b>Hours</b>	<b>Mark-3</b>	<b>Mark-5</b>	<b>Marks15</b>
		<b>5/7</b>	<b>6/9</b>	<b>2/4</b>
I	10	1	1	-
II	10	-	1	-
III	15	1	1	1
IV	8	-	1	-
V	15	1	2	1
VI	8	1	1	-
VII	10	1	1	1
VIII	8	1	1	1
IX	6	1	-	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- II**

**Core Course- ND2C08TM Food Science and Technology**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Write on wheat protein and its effect with water
  2. Brief on Textured vegetable protein
  3. Write on any three heavy metal adulterants
  4. Principles of hydrostatic pressure treatment
  5. What are stabilisers? Write on its role in cookery
  6. Brief on SCP
  7. Write on product standardization in a food service establishment
- (5 x 3=15 marks)

**Part B**

*Answer any **six** questions not exceeding **two pages***

*Each question carries **five** marks*

8. Elaborate on natural toxins in sea foods

9. Explain on non nutritive sweeteners with examples.
  10. What is canning, what are the steps involved in canning.
  11. Discuss the effect of heat and cooking on cereals
  12. Elaborate on stages of sugar cookery
  13. Explain composition and nutritive value of milk
  14. Discuss on enzymatic and non enzymatic browning reaction
  15. Extrapolate on functional foods
  16. Brief on use of bio preservatives as novel method of food preservation.
- (6 x 5 = 30 marks)

### **Part C**

*Answer any two questions not exceeding four pages*  
*Each question carries fifteen marks*

17. Write an essay on traditional processing methods
18. Discuss probiotics under the headings: definition, source, health benefits and quality assurance.
19. Brief on functional properties and role of egg in cookery
20. Discuss on toxic constituents in pulses and mushrooms.

(2 x 15 = 30 marks)

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## **ND2C09TM NUTRITION IN CRITICAL CARE (T)** **(CORE COURSE 9)** **Semester II**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** This course provides an in-depth review on therapeutic nutrient and modes of feeding, intervention to correct nutritional imbalances. The course focuses on critical care, with focus on end stage diseases and palliative care

### **Course Overview and Context**

- Understand the process of nutrition care in hospitals
- Analyse and modify the feeding techniques for specific conditions
- Develop the skill in specialising with therapeutic dietary management

### **Syllabus Content**

#### **Module I: Pre and Post-Operative Diet: (10 hours)**

Type of surgery, physiological response to surgery, assessment of nutritional status, nutritional requirements for various surgical conditions.

#### **Module II: Enteral nutrition (12 hours)**

Introduction, access route, catheter insertion procedure, physical characteristics, advantages and disadvantages, nutrient composition, types of formula, formula calculation, drug administration, monitoring and complications- gastro intestinal, insertion site and metabolic complications.

**Module III: Parenteral Nutrition (12 hours)**

Total parenteral nutrition- short term, long term, peripheral parenteral nutrition. Nutrient composition, PN solutions, osmolarity and osmolality of solutions, administration techniques, monitoring and complications- vein, gastro intestinal, insertion site and metabolic complications

**Module IV: Hospice Nutrition (8 hours)**

Definition, Social and psychological support to terminally ill. Role of palliative care in different conditions- Elderly, cancer patients, paralyzed patients.

**Module V: Nutrition in Stress (12 hours)**

Burns- classification, complications, dietary management. Trauma- Physiological metabolic and hormone response to injury, dietary management. Sepsis- systemic metabolic response. Multiple organ dysfunction syndrome- Nutritional assessment and dietary management. Gastric and Intestinal surgery: Short bowel syndrome, Ileostomy, Colostomy, Rectal surgery

**Module VI: Cardiovascular complications, surgery and transplant (7 hours)**

Clinical and metabolic aspects and special nutritional requirements

**Module VII: End stage Renal Disease and Kidney Transplantation (7 hours)**

ESRD: In diabetic patients and in children Nutritional requirement, fluid and electrolyte management

**Module VIII: Decompensated Liver diseases and transplant (7 hours)**

Complications, nutritional management of liver disease. Nutritional therapy in liver resection and transplantation.

**Module IX: Nutrition and Cancer (15 hours)**

History of cancer, development of cancer, characteristics and identification of cancers. Carcinogens in foods, Etiology and Pathogenesis of carcinogenesis. Metabolic and Nutritional Alterations in Malignancy. Types of therapy and their side effects. Nutritional impacts of cancer therapy. Bone Marrow Transplant and its nutritional care. Nutritional requirement of the Cancer patient

**Competencies of the course**

- C1) Identify the need for preoperative diet
- C2) Analyse the prescriptions for post operative diet
- C3) Gain knowledge on enteral feeding techniques
- C4) Understand the principles and enteral nutrition
- C5) Study the need for parenteral nutrition
- C6) Understand the need and modifications in therapeutic diets
- C7) Learn the specialised methods of parenteral and enteral feed composition
- C8) Study the types of enteral feed based on route and mode of feeding
- C9) Study the types of parenteral feed based on route and mode of feeding



- C10) Understand the types surgeries
- C11) Learn the physiological changes during stress
- C12) Analyse the cause multiple organ dysfunction syndrome
- C13) Understand the causative factors and dietary management of trauma
- C14) Study the effect of gastric and intestinal surgery
- C15) Gain knowledge on palliative care for terminally ill
- C16) Learn the management of end stage renal disease
- C17) Study the clinical aspects of cardio vascular complications
- C18) Be able to differentiate between types of burns
- C19) Study on dietary management during burns
- C20) Familiarities with development of cancer
- C21) Gain knowledge on dietary management of cancers
- C22) Study the effect of nutrients on prevention of cancer
- C23) Familiarise with recent trends in treatment of cancers
- C24) Extrapolate on nutrition intervention in liver resection
- C25) Be able to plan diet for liver transplant
- C26) Study on the nutritional management of liver disease

### **Learning Recourses**

#### **References**

- 1) Rajkumar Rajendram, Victor R. Preedy, Vinood B. Patel, (2015), "Diet and Nutrition in Critical Care", Springer New York.
- 2) Peter Faber, Mario Siervo, (2014), "Nutrition in Critical Care", Cambridge University Press.
- 3) Miranda Kelly, (2014), "Nutrition in Critical Illness, An Issue of Critical Nursing Clinics", Elsevier Health Sciences.
- 4) Gopalan.C, Rama Sastri, B.V, and Balasubramian, S.C. (2012), "Nutritive Value of Indian Foods", NIN, ICMR.
- 5) Preiser, (2005), "Nutrition in Critical Care", Remedica Publishers.

## **ND2C09TM NUTRITION IN CRITICAL CARE**

### **Blue print**

<b>Modules</b>	<b>Hours</b>	<b>Mark-3</b> <b>5/7</b>	<b>Mark-5</b> <b>6/9</b>	<b>Marks15</b> <b>2/4</b>
I	10	-	-	1
II	12	1	1	-
III	12	1	1	1
IV	8	1	1	-
V	12	2	3	-
VI	7	-	1	-
VII	7	-	1	-
VIII	7	1	-	-
IX	15	1	1	2
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- II**

**Core Course – ND2C09TM NUTRITION IN CRITICAL CARE**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Discuss the complications of burns
2. Explain development of cancer
3. What are principles of palliative care.
4. Brief on long term access routes for enteral feeding.
5. What are the physiological changes in trauma
6. Discuss dietary management of ascities.
7. Brief on indications for providing parenteral support to patients.

(5 x 3 = 15 marks)

**Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Write on classification of enteral feed formulas.
9. Define cancer and classify cancer based tissues affected.
10. Write on dietary management of sepsis with MODS.
11. Explain treatment of second degree burn.
12. Discuss the complications of parenteral nutrition.
13. Discuss rheumatic heart disease.
14. Write on points to remember before kidney transplant
15. Define and detail on Hospice nutrition.
16. Brief short bowel syndrome.

(6 x 5 = 30 marks)

**Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Discuss parenteral nutrition under the heads: a. Access routes b. Solutions c. mode of administration.
18. Explain types of cancer therapy and their side effects.
19. Ms Beena is a 30yr old she has a BMI of 18, with a height of 155cm and Hb=10 recently detected a malignant tumor in her left breast. Plan a day's menu for Beena considering her conditions.
20. Elaborate on importance of pre and post operative diets.

(2 x 15 = 30 marks)

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**ND2C10TM Advanced Dietetics and Critical Care (P)  
(CORE COURSE 10)  
Semester II**

**Total Credits: 4**

**Total Lecture Hours: 90**

**Aim of the course:** Equip the beneficiaries with skills to diagnose conditions, plan, prepare and calculate nutrient value for different disease conditions. Practically apply the different therapeutic diets according to health conditions.

**Course Overview and Context**

- Analyse and modify the menu to therapeutic demands
- Develop the skill in the selection of foods for modification of diet
- Plan menu for specific therapeutic conditions

**Syllabus Content**

**Module 1: Market Survey**

Market survey for commercial oral supplements – any ten macro and micro nutrients

supplements produced by nutraceutical companies

**Module 2: Standardisation**

Standardization of common raw and cooked foods for weight and volume measurement.

**Module 3: Enteral Feeding**

Plan and prepare a kitchen formula any critically ill patient.

**Module 4: Routine Hospital Diet**

- 1) Plan therapeutic diet – clear full diet, full fluid diet, soft diet and normal diet.
- 2) Plan the therapeutic diet progression of a severely burnt patient.

**Module 5: Planning and preparation of diets for the following conditions**

- 1) Cardiac diseases- modified diet with fat, sodium- Hypertension, Atherosclerosis
- 2) Renal diseases- modified diet with protein, minerals and fluid- Nephrotic syndrome (paediatric), Glomerulonephritis and Chronic renal failure.
- 3) High calorie diet for underweight, cancer, anaemia and fevers – tuberculosis, typhoid.
- 4) Gastro intestinal diseases- Peptic ulcer, Ulcerative colitis, Diverticulosis, Diarrhoea and Constipation
- 5) Diabetes mellitus - with/without insulin therapy.
- 6) Low calorie diet preparations for obesity and gout
- 7) Liver diseases- Hepatitis, Cirrhosis

**Competencies of the course:**

- C1) Understand the availability of various new supplements in the market
- C2) Identify the volume changes occur during cooking by standardisation
- C3) Understand the need for modification of diet with change in consistency
- C4) Know the points to be considered during the preparation of kitchen formulas
- C5) Analyse the role of common hospital diets
- C6) Learn to plan high calorie diets for underweight patient
- C7) Support to prepare diet for underweight patient
- C8) Learn to plan high calorie iron rich diet for anaemic patient
- C9) Be able to prepare iron rich diet for anaemic patient
- C10) Learn to plan high calorie diet for febrile conditions
- C11) Enable to prepare high calorie diet for febrile conditions
- C12) Learn to plan low calorie diet and prepare diet for obesity
- C13) Enable to plan and prepare diet for burns
- C14) Be able to plan and prepare diet for cardiac diseases
- C15) Enable to plan and prepare diet for renal diseases
- C16) Be able to plan and prepare diet for gastrointestinal diseases
- C17) Understand the modifications, plan and prepare diet for diabetes mellitus with or without insulin therapy
- C18) Enable to plan and prepare diet for gout

C19) Learn the dietary modification of liver diseases  
 C20) Support the planning and preparation of high residue diet

**Learning Resources**

**References**

- 1) Rajkumar Rajendram, Victor R. Preedy, Vinood B. Patel, (2015), "Diet and Nutrition in Critical Care", Springer New York.
- 2) Peter Faber, Mario Siervo, (2014), "Nutrition in Critical Care", Cambridge University Press.
- 3) Miranda Kelly, (2014), "Nutrition in Critical Illness, An Issue of Critical Nursing Clinics", Elsevier Health Sciences.
- 4) Gopalan.C, Rama Sastri, B.V, and Balasubramian, S.C. (2012), "Nutritive Value of Indian Foods", NIN, ICMR.
- 5) Gopalan.C, Rama Sastri, B.V, and Balasubramian, S.C Nutritive Value of Indian Foods, NIN, ICMR, 2012

**ND2C10PM Advanced Dietetics and Critical Care**

**Blue Print**

<b>Module</b>	<b>Hours</b>	<b>Marks-7</b>	<b>Marks-8</b>	<b>Marks- 10</b>	<b>Marks-25</b>	<b>Total Marks(50)</b>
		<b>1/1</b>	<b>1/1</b>	<b>1/1</b>	<b>1/1</b>	
1	14	1	1	1	1	50
2	11					
3	12					
4	12					
5	11					
6	6					
7	10					
8	14					

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**  
**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- II**

**Core Course- ND2C10PM Advanced Dietetics and Critical Care (P)**

**Time: 3 hrs**

**Max.Marks:75**

Mrs. John is an IT professional with irregular food habits suffering from abdominal pain, heart burn and gastrointestinal bleeding. The symptoms has been Diagnosed as peptic ulcer

- |  |            |
|--|------------|
| 1. Plan a day's menu for the above patient         | (20 marks) |
| 2. Calculate the Energy, Protein, Fat, Fiber, Iron | (10 marks) |
| 3. Prepare dinner from planned menu                | (30 marks) |
| 4. Record  | (15        |
| marks)   | )          |

❖ Individual case studies will be given for each student

**ND3C11TM Applied Nutrition (T)**  
**(CORE COURSE 11)**  
**Semester III**

**Total Credits: 4**

**Total Lecture Hours: 90(5 Hours/ Week)**

**Aim of the course:** To Understand the dynamic nature of nutrition and the complex biochemical factors that influence health status.

**Course Objective**

- Understand and be able to apply behavior change principles as they apply to health settings.
- Demonstrate a working knowledge of the basic principles of nutrition and how they relate to overall health and exercise performance.
- Understand the factors influencing the development of eating disorders and eating disorder sequelae.
- Scrutinize the development in the field of nutrition.

**Syllabus Content**

**Module I: Nutrition and weight management (16 Hours)**

Regulation of body weight, Genetics and body weight, body weight assessment Obesity: Etiology, Assessment, Classification, Management of Obesity - Medical, Nutritional, Lifestyle management, Role of exercise, Surgical complications, Childhood Obesity. Underweight: Etiology Metabolic consequences of starvation and Management.

**Module II : Eating Disorders (12 Hours)**

Nutritional Aspects of Eating Disorders and Nutritional management of eating disorders -

Anorexia Nervosa, Bulimia Nervosa, Binge eating disorders, Anorexia athletic, Body dysmorphic disorder, Muscle dysmorphic disorder (bigorexia), Orthorexia nervosa, Pregorexia, Drunkorexia, Infection-triggered, auto immune subtype of anorexia nervosa in young children, Night-eating syndrome, Rumination syndrome, Gourmand syndrome, Prader-Willi syndrome, Pica, Cyclic vomiting syndrome, Chewing and spitting.

**Module III: Food Allergy (13 Hours)**

Definition, Symptoms and mechanism of food allergy, Diagnosis – Biochemical, immuno testing, history and food record, Elimination diets, Food Selection, Medication, Food allergy in infancy.

**Module IV: Special conditions (14 Hours)**

**Space nutrition** – Foods developed for different space flights, Apollo – Soyuz test project. International space station, Food system engineering facilities, Types of space foods, Microgravity, Baseline space shuttle food and beverages, International space station daily menu and standard menu, Space shuttle standard menu, USDA food guide pyramid.

**High altitude nutrition** – Acclimatization, Hydration, Micronutrient ratio and calories, altitude sickness, Effect of altitude on energy balance, Fluid requirements, Hypoxia, weight loss, gastrointestinal complaints.

**Polar** – Key developments in nutrition, Fundamentals of polar diet, Formulation of a polar diet, Hunger and starvation, Nutrition in inter war period.

**Module V: Nutrition counseling (12 Hours)**

Diet counseling skill: Tactics and techniques of counseling – evaluating and understanding clients attitude, how to identify and express feelings towards the client, utilizing proper counseling techniques – verbal behavior, non – verbal behavior, covert behavior. Concepts and principles in communication and their application in developing skills in counseling, use of communication aids, communication and interviewing skills.

Counseling process, Community counseling – Community education, crisis intervention, assessment, client records, orientation of services for clients, client care plan, referral, follow up. Ethics and the counselor.

**Module VI : Immuno Nutrition (13 Hours)**

Nutrients affecting the immune system at the physiological, cellular and genetic level. Nutrients involved in the Inflammatory response. Role of specific nutrients in immune suppression. Role of nutrients in Immune promotion acute inflammation: features, causes, vascular and cellular events, inflammatory cells and mediators, chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples, repair, Wound healing by primary and secondary union, factors promoting and delaying the process. Healing in specific site including bone healing.

**Module VII : Nutrigenetics and Nutrigenomics (10 Hours)**

Introduction, Definition, Gene Expression, role of specific nutrients in controlling gene expression : Proteins / Lipids /Fuel molecules and lipogenesis / Minerals / Vitamins,. Genes and diseases. Genetic variation and dietary response. Human genome Project, Epigenomics.

**Competencies of the course**

- C1) Demonstrate an understanding of the general principles of fitness
- C2) Understand the aspects of counseling.
- C3) Pinpoint the pathways development in nutrigenomics.
- C4) Achieve knowledge evaluating educational programs
- C5) Get an idea about Prescribing safe and effective exercise for a variety of populations
- C6) Recognize the different eating disorders.
- C7) Explain the significance of diet in food allergy.
- C8) Extrapolate the impact of nutrition in special conditions.
- C9) Recognize the importance of community nutrition.
- C10) Analyse the different aspects of immunonutrition.

### **Learning Resources**

#### **Reference:**

- 1) Bharat B. Aggarwal, David Heber, (2014), "Immunonutrition: Interactions of Diet, Genetics, and Inflammation", CRC Press.
- 2) Sareen Gropper, Jack Smith, (2012), "Advanced Nutrition and Human Metabolism", Cengage Learning.
- 3) Anne Payne, Helen M. Barker, (2011), "Advancing Dietetics and Clinical Nutrition", Elsevier Health Sciences.
- 4) Krause's Food and Nutrition Therapy, (2010), 12<sup>th</sup> Edition.
- 5) Paul Insel, R. Elaine Turner, Don Ross, (2009), "Discovering Nutrition", Jones & Bartlett Publishers.
- 6) Lynnette R. Ferguson, (2013), "Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition", CRC Press

### **ND3C11TM Applied Nutrition Blue Print**



<b>Module</b>	<b>Hours</b>	<b>Mark-3</b> <b>5/7</b>	<b>Mark-5</b> <b>6/9</b>	<b>Marks15</b> <b>2/4</b>
I	16	-	1	1
II	12	1	1	-
III	13	2	1	1
IV	14	-	2	1
V	12	1	3	-
VI	13	1	-	1
VII	10	2	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- III**

**Core Course- ND3C11TM APPLIED NUTRITION**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Define and differentiate 'nutrigenetics' and 'nutrigenomics'
2. What is immune testing?
3. Describe Human Genome Project
4. Write a note on Prader-Willi syndrome.
5. Briefly explain "Elimination diet".
6. Write a short note on nutrients involved in inflammatory response
7. Brief on communication aids in counselling.

(5 x 3 =15 marks)

**Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Discuss on a five types of eating disorders.
9. Explain Anaphylaxis.
10. Describe the ethics of counselling and counsellor.
11. Write a note on Types of space foods.
12. Detail on types of counselling skills.
13. Explain on Bariatric surgery.
14. Detail on Epigenomics.
15. Explain on counselling process.
16. Describe the modification of diet in polar regions.

(6 x 5 = 30 marks)

**Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Discuss on Space Nutrition and different types of space foods developed.
18. Explain about nutrients affecting the immune system at various levels.
19. Elaborate on medical, nutritional and dietary management in Obesity
20. Define Food allergy and explain the following;
  - a. Symptoms of food allergy
  - b. Diagnosis
  - c. Dietary management

(2 x 15 = 30 marks)

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**ND3C12TM Hospital Management (T)**  
**(CORE COURSE 12)**  
**Semester III**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** Introduce functioning of food service establishments. Discuss the various management criteria in food service establishments: food service, financial management, personal management.

**Course Overview and Context**

- Develop knowledge of efficient management of hospital; being a part of medical team
- Gain insight into every aspect of catering management, where a dietician is directly involved
- Learn administrative aspects of hospital management
- Gain knowledge on software programming

**Syllabus Content**

**Module I: Food Service Establishments**

**(10 hours)**

Structure, History and Development, Types of Food Service Establishments - Commercial Establishments, Non-Commercial Establishments.

**Module II: Institutional Food Management (10 Hours)**

Organisational hierarchy, Approaches to Management, Principles of management, functions of management- planning, organizing, directing, coordinating, controlling and evaluating, Management Process- Tools of Management, Management of resources- money, space, materials, equipments, staff, time, energy and procedures.

**Module III: Food Management (10 Hours)**

Food purchasing, Receiving and Storage of foods, Menu planning. Food Service: Style of Service & Types of Service. Environmental hygiene and sanitation, Waste disposal, Food handling practices, Personal hygiene Safety and security, Legal responsibilities of a food service institution, Food Standards.

**Module IV : Financial Management (26 Hours)**

Definition & Scope of application of Management accounting, Cost concept, Components of costs, Cost control, Pricing, Book keeping & accounting

**Module V: Personnel Management (10 Hours)**

Recruitment, Selection, induction, employee facilities & benefits, Types of employee welfare Schemes, training and development of employees.

**Module VI: Presentations using Power Point (12 Hours)**

Creating Presentations - Slides. New Slid, Slide Layout, Applying a Slide Layout, Slide Design, Design Templates, Colour Schemes, Slide Background, Changing Slide background, Deleting Slides, Slide Show, Show Type, Show options, Animation schemes, Slide Transition, Setting up Shows, Custom Shows, Printing Slides.

**Module VII: SPSS and its Applications (12 Hours)**

Defining variables - Numeric and String Variables - Assigning Names and Labels to variables and values - Entering Data - Summary Statistics - Frequencies - Descriptive Statistics Means - Crosstab - Graphs - Histograms and Bar charts- Scatter diagram, Pie Diagram - Bivariate Correlation - Linear regression - Test of mean - One Sample t-test, Independent sample t-test- Paired samples t-test - One way ANOVA- Chi square test.

**Competencies of the course**

- C1) Study on food service establishments
- C2) Differentiate between commercial and non commercial food service establishments
- C3) Familiarise with soft ware programming
- C4) Study on types of organisations
- C5) Learn on division of labour in an organisation
- C6) Understand the importance of organisation chart in managing food service organisation
- C7) Gain knowledge on elements of management
- C8) Gain knowledge on tools of management
- C9) Understand importance of menu planning
- C10) Learn to make an informative and attractive menu card
- C11) Familiarise with sequence of courses for Indian and continental menu
- C12) Understand the basics of preparing power point presentations
- C13) Familiarise with delivery and receiving procedures

- C14) Differentiate storage spaces based on perishability of foods
- C15) Identify the classification of equipments
- C16) Identify the factors affecting selection and purchase of equipments
- C17) Study the centralised and decentralised delivery systems
- C18) Familiarise with different food service systems
- C19) Gain knowledge on different styles of services
- C20) Attain awareness on specialised forms of food service
- C21) Introduce to accounting and its basic rules
- C22) Study difference between book keeping and accounting
- C23) Learn to make journal entry, posting etc
- C24) Understand the definition of cost and study its types
- C25) Analyse the factors that act as profit centres
- C26) Gain knowledge on food cost control
- C27) Study the importance and practices for personal hygiene
- C28) Learn about garbage disposal measures
- C29) Understand the need for general hygiene practices in hospitals
- C30) Study the different types of accidents in food service establishments
- C31) Attain information on causes and prevention of accidents
- C32) Familiarise with different types of extinguishers and their function

#### **Learning Resources**

##### **References**

- 1) Wallace J. Hopp, William S. Lovejoy, (2012), "Hospital Operations: Principles of High Efficiency Health Care", FT Press.
- 2) A.K. MALHOTRA, (2009), "Hospital Management: An Evaluation", Global India Publications.
- 3) BM Sakharkar,(2008), "Principles of Hospital Administration and Planning", Jaypee Brothers,Medical Publishers Pvt. Limited.
- 4) Frank J. Fabozzi, Pamela P. Peterson, (2003), "Financial Management and Analysis", John Wiley & Sons.
- 5) Cole Davis, (2013), "SPSS for Applied Sciences: Basic Statistical Testing", Csiro Publishing.

### **ND3C12TM Hospital Management Blue print**

<b>Modules</b>	<b>Hours</b>	<b>Mark-3</b>	<b>Mark-5</b>	<b>Marks15</b>
		<i>5/7</i>	<i>6/9</i>	<i>2/4</i>
I	10	-	1	1
II	12	1	1	1
III	12	2	1	1
IV	26	1	2	1
V	10	1	1	-
VI	10	1	1	-
VII	10	1	2	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- III**

**Core Course – ND3C12TM Hospital Management**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Explain organisational hierarchy.
2. Write a short note uses of SPSS.
3. What are extinguishers, give the different types
4. Brief on rules for debit and credit in different accounts.
5. Explain the types of employee welfare program
6. Write a short note on personal hygiene
7. List out a flow chart to insert a slide into an existing slide show.

(5 x 3 = 15 marks)

**Part B**

*Answer any **six** questions not exceeding **two** pages*

*Each question carries **five** marks*

8. Write on non commercial food service establishments
9. Brief on steps in recruitment of staff in an establishment
10. Explain the data entry window of SPSS.
11. Explain different types of cost involved in food production
12. Differentiate between book keeping and accounting.
13. Points to be noted while preparing a presentation using power point.
14. Points to be noted while naming a variable.
15. Explain the steps in receiving and storage of foods purchased
16. Write on elements of management.

(6 x 5 = 30 marks)

**Part C**

*Answer any **two** questions not exceeding **four** pages*

*Each question carries **fifteen** marks*

17. Discuss accounting and its objectives, also illustrate the format of journal and ledger
18. Explain different styles and types of services.
19. Define food service systems. Discuss on types of food service establishments.
20. Explain the principles and functions of management

(2 x 15 = 30 marks)

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**ND3C13TM Clinical Biochemistry (T)  
(CORE COURSE 13)  
Semester III**

**Total Credits: 4**

**Total Lecture Hours: 90(5 Hours/ Week)**

**Aim of the course:** The course enlighten the students about clinical biochemistry by comparing normal and abnormal metabolic conditions. A laboratory component has also been included in the course to enhance the biochemistry and nutrition concepts presented and provide direct interaction with the science of biochemistry.

**Course Overview and Context**

- Analyse the pathophysiological changes in different organs in different disease conditions
- Comprehend the metabolic changes occurring in disease conditions
- Interpret various diagnostic tests and parameters

**Syllabus Content**

**Module 1: Nutrition and Metabolic Syndrome**

**(10 Hours)**

Overview, Prevalence, Etiology, Risk factors, Complications and Management. Special

emphasis to preventive role of nutrition and lifestyle, Metabolic changes of adipose tissue- during fasting, starvation, well fed conditions and changes during exercise

**Module II: Metabolic alterations in Diabetes Mellitus (12 Hours)**

Insulin- Biosynthesis, degradation, structure, mechanism of action and physiological action, metabolic derangements in diabetes mellitus- carbohydrate, protein and fat metabolism

**Module III: Metabolic alterations in Liver diseases (10 Hours)**

Fatty infiltration, fatty liver – definition, causes and action of lipotropic factors, Catabolism and anabolism of ketonebodies, regulation of ketogenesis, ketosis and its consequences. Biochemical parameters.

**Module IV: Metabolic alterations in cardiovascular diseases (12 Hours)**

Progressive stages of plaque formation, Lipoprotein metabolism- VLDL and LDL ('Forward' Cholesterol transport) VLDL and LDL (Endogenous TAG transport) HDL ('Reverse' Cholesterol transport) alterations in structure and function of lipoproteins, Lipid profile, types, synthesis, biological and clinical actions of prostaglandins. Synthesis of steroid hormones

**Module V: Action of free radicals and antioxidants (12 Hours)**

Overview, Types, action, mechanism of antioxidants, role of oxygen free radicals and production, physiological mechanisms to limit free radical damage, free radical in the pathophysiology of diseases, enzymatic regulation of damage

**Module VI: Biochemical aspects of hematology (10 Hours)**

Disorders of erythrocyte metabolism, hemoglobinopathies, thalassemias thrombosis and anemias. Laboratory tests to measure coagulation and thrombolysis

**Module VII: Inborn Errors of Metabolism (14 Hours)**

Carbohydrate- Introduction, Glycogen storage diseases, Fructosuria, Galactosemia, Protein metabolism: Phenylalanemia, homocystinuria, tyrosinemia, MapleSyrup Urine Disease, phenylketonuria, alkaptonuria, albinism and aminoacidurias  
Fat metabolism: Hyperlipoproteinemia, Gaucher's disease, Tay-Sach's and Niemann-Pick disease, Abetalipoproteinemia

**Module VIII: Diagnostic tests (10 Hours)**

Typhoid function test, Renal function test, Cardiac function test, Enzymology -LDH, CPK, AST, ALT, ALP, ACP, GGT, Amylase, 5' nucleotidase. Haematological test- Haematocrit, PCV, RBC indices.

**Competencies of the course**

- C1) Identify the disease involved in metabolic syndrome
- C2) Analyse the steps of plaque formation
- C3) Gain knowledge on inborn errors of carbohydrate metabolism

- C4) Understand inborn errors of protein metabolism  
 C5) Study the term haemoglobinopathies  
 C6) Understand the need of diagnostic tests.  
 C7) Learn the importance of lipoprotein metabolism  
 C8) Study the types of insulin used synthesis  
 C9) Study the metabolic alteration of liver diseases  
 C10) Understand the types of diabetes mellitus

**Learning Resources**

**References**

- 1) Allan Gaw, (2008), "Clinical Biochemistry: An Illustrated Colour Text", Elsevier Health Sciences.
- 2) Nessar Ahmed, (2010), "Clinical Biochemistry", OUP Oxford.
- 3) Vasudevan D.M, Sreekumari S, (2005), "Text Book of Biochemistry", Jaypee Brothers Medical Publishers(P), Ltd, New Delhi.
- 4) William J. Marshall, Márta Lapsley, Andrew Day, Ruth Ayling, (2014), "Clinical Biochemistry: Metabolic and Clinical Aspects", Elsevier Health Sciences.
- 5) Nanda Maheshwari, (2008), "Clinical Biochemistry", Jaypee Brothers Publishers.

**ND3C13TM Clinical Biochemistry**

Blue print

<b>Module</b>	<b>Hours</b>	<b>Mark-3 5/7</b>	<b>Mark-5 6/9</b>	<b>Marks15 2/4</b>
I	10	1	1	-
II	12	1	1	-
III	10	1	1	1
IV	12	1	1	1
V	12	1	1	1
VI	10	1	1	-
VII	14	1	1	1
VIII	10	-	2	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>



**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- III**

**Core Course – ND3C13TM Clinical Biochemistry**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Discuss the term Gaucher's disease
2. Explain the structure of insulin.
3. What is fatty liver and role of lipoproteins?
4. Brief on thalassemia
5. State the diseases in metabolic syndrome and aetiological factors
6. Discuss functions of prostaglandins.
7. Brief on superoxide dismutase.

(5 x 3 = 15 marks)

**Part B**

*Answer any **six** questions not exceeding **two pages***

*Each question carries five marks*

8. Write the synthetic processes of steroid hormones.
9. Discuss the metabolic changes of adipose tissues during different conditions.
10. Write a note on various haemoglobinopathies.
11. Explain about recent cardiac tests commonly used.
12. Define ketogenesis. Explain the types of ketone bodies and ketosis
13. Discuss insulin management of diabetes mellitus.
14. Write on any five inborn errors of protein metabolism
15. Discuss synthesis and action of oxygen free radicals
16. Brief on renal function tests.

(6 x 5 = 30 marks)

### **Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Define the term inborn errors of metabolism. Explain carbohydrate metabolic disorders
18. Explain plaque formation in atherosclerosis. Write the metabolism of lipoproteins and changes of lipoproteins in cardiac diseases
19. Describe the mechanisms to prevent the damages by free radicals on body
20. Elaborate metabolic changes contribute to liver diseases

(2 x 15 = 30 marks)

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## **ND3C14TM Nutritional Pharmacology (T)** **(CORE COURSE 14)** **Semester III**

**Total Credits: 4**

**Total lecturer hours: 72 (4 Hours/ Week)**

**Aim of the course:** **Aim of the course:** To understand the fundamental principles of pharmacokinetics that underlay the absorption, distribution, metabolism and elimination of drugs in the body and thereby affect drug effectiveness.

### **Course Overview and Context**

- Understand the fundamental scientific principles of drug action and the various mechanisms by which drugs can mediate their pharmacological effect.
- Understand the biochemical reactions that result in the metabolism of drugs within the body.
- Understand the rationale behind designing different dosing regimens of particular drugs in specific patient populations.
- Understand how specific patient characteristics and genetics can affect the response to a particular class of drugs.
- Understand the scientific basis underlying how two different drugs can interact within the body and can have undesirable effects either on drug concentrations or drug clinical effects

### **Syllabus Content**

**Module I: General principles of Nutritional Pharmacology (13 Hours)**

Definitions, classification of drugs, sources of drugs, routes of drug administration, principles of pharmacokinetics and pharmacodynamics, principles of toxicology and treatment of poisoning, pharmacogenomics, essential drug concepts, drug toxicity, drug allergy, drug resistance, drug potency, efficacy and drug antagonism, drug addiction and drug abuse, toxicity studies in animals.

**Module II: Effects of Food on Drug therapy (10 hours)**

Digestion, absorption, distribution and excretion of drugs, Medication and enteral nutrition reaction, effect of nutrients and nutritional status on absorption and metabolism of drugs. Physiological consequences.

**Module III: Effect of Drug on Food and Nutrition (13 hours)**

Nutrient digestion, absorption, distribution, excretion. Modification of drug action by food. Drug and nutrient interaction: Effect of drugs on nutrient intake, absorption and metabolism, requirement, summary of action of some common drugs. Major mechanisms that can lead to drug-drug interactions, Role of enzyme induction and inhibition of metabolic enzymes play in drug metabolism.

**Module IV: Effects of drug on Nutritional status (10 hours)**

Effect on chemical senses, gastrointestinal effects, and appetite changes organ system toxicity, Effect on glucose levels, Excipients and food drug interactions.

**Module V: Systemic Pharmacology (14 hours)**

Autonomic nervous system, cardiovascular system, Renal function, Gastro intestinal system, Central nervous system, Blood, Autocoids, Respiratory system.

Drugs affecting uterine motility, Heavy metals and chelating agents, Drugs used for immunomodulation: Immunostimulants, Immunosuppressant's, Hormones and hormone antagonists, Chemotherapy of microbial diseases, Chemotherapy of Neoplastic diseases, NSAID's, Therapeutic gases.

**Module VI: Drug Regulations (12 hours)**

Drugs and Cosmetics Act, Drug Price Control order, Application for Investigational New Drug (IND), Application for New Drug Discovery (NDD) according to Indian Control Authority & USFDA guidelines. Conducting bio-equivalence studies. Ethical considerations in utilizing human subjects for drug discovery process. ICH-GCP Guidelines. Ethical guidelines in utilizing animals for experimental purposes.

**Competencies of the course:**

- C1) Choose and prescribe medicines safely and effectively
- C2) Use essential medicines rationally
- C3) Pinpoint the Theoretical aspects related to essential medicines
- C4) Achieve knowledge about pharmacological concepts.
- C5) Identify which specific drugs belong to each major drug class
- C6) Recognize the uses of various therapeutic drugs
- C7) Understand the indications

- C8) Realize the clinical effects.  
C9) Recognize the mechanism of action.  
C10) Analyse the chemistry between food and drug consumption.  
C11) Realize the and adverse effects of each of the major drug classes  
C12) Ascertain the relation between the food – drug metabolism.  
C13) Achieve knowledge about different pharmacological laws and regulations

**Learning Resources**

**References**

- 1) [Satoskar R S](#), [Nirmala Rege](#), [SD Bhandarkar](#), (2015), “Pharmacology and Parmacotherapeutics”, Elsevier Health Sciences.
- 2) [Stanley Zaslau](#) (2013), “Lippincott's Illustrated Q&A Review of Pharmacology”, Lippincott Williams & Wilkins.
- 3) Joseph I. Boullata, Vincent T. Armenti, (2010), “Handbook of Drug-Nutrient Interactions”, Springer Science & Business Media.
- 4) Richard Finkel (PharmD.), Michelle Alexia Clark, Luigi X. Cubeddu, (2009) “Pharmacology”, Lippincott Williams & Wilkins.
- 5) [Mitchell Bebel Stargrove](#), [Jonathan Treasure](#), [Dwight L. McKee](#), (2008) “Herb, Nutrient, and Drug Interactions: Clinical Implications and Therapeutic Strategies”.

**ND3C14TM Nutritional Pharmacology**

**Blue Print**

<b>Module</b>	<b>Hours</b>	<b>Mark-3 5/7</b>	<b>Mark-5 6/9</b>	<b>Marks15 2/4</b>
I	13	1	2	1
II	10	1	-	1
III	13	1	2	-
IV	10	1	2	-
V	14	2	1	1
VI	12	1	2	1
<b>Total</b>	<b>72</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

ST.TERESA'S COLLEGE, ERNAKULAM  
(Autonomous)  
MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS  
Semester- III

Core Course- ND3C14TM NUTRITIONAL PHARMACOLOGY

Time: 3 hrs

Max.Marks:75

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Differentiate pharmacokinetics and pharmacodynamics.
2. Explain the effect of nutrients on metabolism of drug.
3. Describe the role of enzyme induction in drug metabolism
4. Write a note on NSAID'S
5. Briefly explain role of drug on appetite
6. Write a short note on chemotherapy of microbial disease
7. Brief on drug price control order.

(5 x 3 = 15 marks)

**Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Discuss on principles of toxicology and treatment of poisoning.
9. Explain on major mechanisms that can lead to drug - drug interaction.
10. Describe the USFDA guidelines for application of new drug discovered.
11. Write a note on drug addiction and drug abuse.
12. Describe the modification by action of food
13. Explain on any two drug regulations
14. Detail on immunosuppressant and immunostimulants
15. Explain effect of drug on nutritional status
16. Detail on food drug interaction

(6 x 5 = 30 marks)

**Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. Discuss on digestion, absorption and metabolism of drug
18. Explain about any two systemic drugs and its mechanism of action

19. Elaborate on ethical considerations in utilising human and animal subjects for drug experiments
20. Discuss about drugs under the following headings
- a. Drug allergy
  - b. Drug resistance
  - c. Drug potency
  - d. Drug efficacy
  - e. Drug antagonism

(2 x 15 = 30 marks)

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**ND3C15PM Yoga and Basic Life Support (P)**  
**(CORE COURSE 15)**  
**Semester III**

**Total Credits: 4**

**Total Lecture Hours: 108 (6 Hours/ Week)**

**Aim of the course:** The course aims at introducing yoga practices to its beneficiaries. It helps in harnessing the power of our mind towards healthy living. Knowledge in nutrition, dietetics and yoga will give a holistic approach towards management of disease conditions. The course is also concerned with developing awareness in terms of first aid, which is important in professional as well as daily life.

**Course Overview and Context**

- Understand practices of yoga for all-round personality development
- Learn stress management techniques
- Understand the significance of emergency medicine
- Educate on basic first aid
- Inculcate presence of mind in times of accidents

**Syllabus Contents**

**Module I**

**(10 hours)**

Introduction to Yoga: definition, objectives, need and importance. Different streams of yoga, five points of yoga. 8 limbs of yoga, general instructions for the practitioner. Do's and Don'ts	
<b>Module II</b>	<b>(15 hours)</b>
Kriyas, pranayama and meditation	
<b>Module III</b>	<b>(15 hours)</b>
Basic asanas and benefits	
<b>Module V</b>	<b>(14 hours)</b>
Surya namaskara: introduction steps of suryanamaskara	
<b>Module VI</b>	<b>(8 hours)</b>
<ul style="list-style-type: none"> <li>• Introduction to basic life support</li> <li>• Recognition of sudden cardiac arrest (SCA) and activation of the emergency response system</li> <li>• Learn to look for arterial pulse</li> <li>• Learn to look for breathing patterns</li> </ul>	
<b>Module VII</b>	<b>(12 hours)</b>
<ul style="list-style-type: none"> <li>• CPR: Adults, Infants</li> <li>• Chest compressions : Hands on training</li> <li>• Rescue Breaths</li> <li>• Early Defibrillation With an AED(optional)</li> <li>• Recovery position</li> </ul>	
<b>Module VIII</b>	<b>(17 hours)</b>
<ul style="list-style-type: none"> <li>• BLS during choking</li> <li>• Relief of Foreign-Body Airway Obstruction</li> <li>• Basics of heart attack, stroke, hypoglycemia ,hypothermia</li> </ul>	
<b>Module IX</b>	<b>(18 hours)</b>
<ul style="list-style-type: none"> <li>• Snake Bite : Primary care</li> <li>• Other bites and stings: Primary care</li> <li>• BLS during road accidents: Log roll, helmet removal, spine fractures</li> <li>• Basic trauma victim management</li> <li>• Basic wound management</li> <li>• Burns, scalds, electric shock</li> </ul>	
<b>Competencies of the course:</b>	
C1) Familiarise with definition and objectives of yoga	
C2) Understand the different streams of yoga	
C3) Study the five points of yoga	
C4) Understand the 8 limbs of yoga	
C5) Familiarise with Do's and Don'ts of yoga practices	
C6) Understand the kriyas of yoga	
C7) Study the pranayama and meditation techniques	
C8) Practice with basic asanas	
C9) Study the health benefits of asanas	
C10) Understand the steps of suryanamaskara	

- C11) Study the benefits of suryanamaskara  
 C12) Study the importance of basic life support  
 C13) Enable to check for arterial pulse  
 C14) Familiarise with defibrillator  
 C15) Train on recovery position after CPR  
 C16) Study on the basic life support methods of choking  
 C17) Identify snake bites and first aid steps  
 C18) Enable identification of bits and stings  
 C19) Familiarise with first aid :log roll, helmet removal and spine fractures in road accidents  
 C20) Enable to be efficient trauma management persons  
 C21) Study basic wound management  
 C22) Acquire knowledge on first aid in burns, scald and electric shock  
 C23) Gain knowledge on basics of heart attack, strokes and its effective life support methods  
 C24) Acquire knowledge on basics of hypoglycaemia and hypothermia2

**Learning Resources**

**References**

- 1) K.S.Iyengar, "Light on Yoga" Schocken Publisher, 1995
- 2) Mary Nurriestearns, "Yoga for Emotional Trauma medications and practices for healing pain and suffering", Harbinger Publications
- 3) Dr. R Nagaratna and Dr. H.R Nagendra, " Yoga for Hypertension and Heart Diseases, Vivekananda Yoga Research Foundation
- 4) Rajeev Roy, "Yoga for Health and Happiness", Tiny Tot Publications
- 5) Yogacharya Govindan Nair, Yogapadavali, D.C Books, Kottayam
- 6) Dr.Gireesh Kumar, Advanced emergency life support protocols, Paras books, 2015

**ND3C15PM Yoga and Basic Life Support (P)**  
 Blue Print

<b>Module</b>	<b>Hours</b>	<b>Mark-10 3/3</b>	<b>Marks-20 1/1</b>
I	5	-	-
II	5	1	-
III	15	1	-
IV	15	1	-
V	14	-	1
<b>Total</b>	<b>54</b>	<b>3</b>	<b>1</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**  
**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- III**



**Core Course –ND3C15PM Yoga and Basic Life Support**

**Time: 3 hrs**

**Max.Marks:100**

1. Write the Do's and Don'ts while practicing yoga (10marks)
2. Write one kriya to improve eye sight and demonstrate the same (10 marks)
3. Demonstrate any one asana  
Ardhacakrasana / bhujangasana / Vakrasana (10 marks)
4. Enlist the steps and demonstrate suryanamaskara (20 marks)
5. Write different types of snake bite and treatments (10marks)
6. How will you remove helmet from an accident person's head?  
Demonstrate (15 marks)
7. What is CPR? Demonstrate the same (15 marks)
8. How will you recognise sudden cardiac arrest and activate emergency  
response system? (10 marks)

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**ND4C16TM Food Microbiology and Quality Control (T)**  
**(CORE COURSE 16)**  
**Semester IV**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/Week)**

**Aim of the course:** To make students understand the means to prevent microbial spoilage during and after food processing and also to make them aware about the all aspects of food microbiology and quality control.

**Course Overview and Context**

- Attain knowledge on basic principles of food microbiology.
- Analyse the role microorganisms in food spoilage
- Unfold the use of microorganisms in food product development
- Scrutinize the Quality control aspects in food industries.

**Syllabus Content**

**Module 1: Introduction Food and Microorganisms (9 Hours)**

Classification of microorganism, Microorganisms important in food microbiology, food as a substrate for microorganisms, Factors affecting the survival and growth of microorganisms in food – Intrinsic and extrinsic factor - Hydrogen ion concentration, Moisture requirement, concept of water activity, temperature, oxidation reduction potential, inhibitory substances and biological structure.

**Module II: Contamination of Foods (9 Hours)**

Contamination from green plants and fruits, animals, sewage, soil, water, air, contamination during handling and processing of foods. Food spoilage – Definition, types of spoilage-physical, enzymatic, chemical and biological spoilage.

**Module III : Principles of Food Preservation (11 Hours)**

General principles of food preservation, Asepsis, removal of microorganism, maintenance of anaerobic conditions, use of acids, fermentation, use of high temperature, use of low temperature, mechanical destruction, chemical preservation, carbonation, irradiation.

**Module IV: Spoilage of Different Types of Food (15 Hours)**

Source type and effect of microorganisms on the following: Fruits and vegetables, Milk and milk products, Meat and meat products, Fish and other sea foods, Egg and poultry, cereals and canned foods.

**Module V: Culture Techniques in Food Microbiology (12 Hours)**

General principle of culture maintenance and preparation, bacterial cultures, yeast cultures, mold cultures, instruments and equipments. Methods of isolation and detection of microorganisms or toxic compounds produced in foods. Physical, chemical and molecular methods, Bioassays

**Module VI: Food in relation to disease (12 Hours)**

Food borne infections and intoxications: Bacterial and non bacterial. Foodborne illness, food borne disease outbreaks and preventive measures.

**Module VII: Microbiology in Food Plant Sanitation (8 Hours)**

Bacteriology of water, sewage and waste treatment, microbiology of food product, good manufacturing practices, Hazard Analysis Critical Control Point (HACCP), health of employees.

**Module VIII: Food Laws and Regulations (6 Hours)**

Enforcement and Control agencies, Quality assurance: Microbiological quality standards of food. Government regulatory practices and policies. FDA, EPA, ISI.

**Module IX: Applications of Food Microbiology (8 Hours)**

Microorganisms in Human Welfare, Beneficial Uses of Microorganisms in Food, Intestinal Beneficial Bacteria-Concept of Prebiotics and Probiotics, Economic importance of microorganisms. Biosensors in food. Importance of microbes in food biotechnology: genetically engineered organisms, probiotics and single cell proteins. Dairy products (cheese and yoghurt) and traditional Indian fermented foods and their health benefits.

**Competencies of the course**

- C1) Explain the food spoilage that can occur in different food products.
- C2) Enable to use proper control measure for food safety.
- C3) Analyse the differentiation of different microorganisms
- C4) Achieve knowledge about culture techniques.

- C5) Attain knowledge on various bioassays.  
 C6) Analyse the role of microorganisms in food microbiology.  
 C7) Familiarize the different preservation techniques.  
 C8) Acquire knowledge on HACCP and other food standards.  
 C9) Gain knowledge regarding the importance of microorganisms.  
 C10) Understand the ways of food contamination.

**Learning Resources**

**References**

- 1) Bibek Ray, Arun Bhunia, (2013), "Fundamental Food Microbiology", CRC Press.
- 2) James M. Jay (2012), "Modern food microbiology", Springer Science & Business Media Publishers.
- 3) Gould, G. W. (2012), "New Methods of food preservation", Springer Science & Business Media
- 4) Manay, N.S. Shadaksharaswamy, M. (2004), "Foods- Facts and Principles", New age international publishers, New Delhi.
- 5) Ahmed E. Yousef, Carolyn Carlstrom, (2003) "Food Microbiology: A Laboratory Manual", John Wiley & Sons.
- 6) Srilakshmi, B..(2003), "Food Science", New Age International Publishers, New Delhi.
- 7) Subalakshmi, G and Udipi, S.A. (2001), "Food processing and preservation". New Age International Publishers, New Delhi

**ND4C16TM Food Microbiology and Quality Control (T)**

**Blue Print**

<b>Module</b>	<b>Hours</b>	<b>Mark-3 5/6</b>	<b>Mark-5 6/9</b>	<b>Marks15 2/4</b>
I	9	-	2	-
II	9	1	2	-
III	11	1	1	1
IV	15	1	1	1
V	12	1	-	1
VI	12	-	-	1
VII	8	1	1	-
VIII	6	1	1	-
IX	8	1	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**  
**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**  
**Semester- IV**

**Core Course- ND4C16TM - Food Microbiology and Quality Control (T)**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Explain the term GMP.
2. Briefly explain the term food borne illness and its etiological factors.
3. What is ELISA?
4. What do you mean by microbiological standards?
5. What are the aims of food preservation?
6. Explain the economic importance of microorganisms.
7. What are the causes of spoilage in meat?

(5 x 3=15 marks)

**Part B**

*Answer any six questions not exceeding two pages*

*Each question carries five marks*

8. Explain botulism in terms of causes, foods involved, symptoms and prevention.
9. Discuss on food spoilage and the types of food spoilage.
10. Explain the HACCP and its importance in quality control
11. Describe the role International agencies in monitoring food safety.
12. Discuss on industrial importance of microorganisms.
13. Explain on the factors effecting growth of microorganisms. Mention the intrinsic and extrinsic factors.
14. Explain the principles of food preservation and how high temperature used for this.
15. Write the classification of microorganisms and specify their importance in food industry.
16. Explain the ways in which food gets contaminated.

(6 x 5=30 marks)

**Part C**

*Answer any two questions not exceeding four pages*

*Each question carries fifteen marks*

17. How can we preserve food by application of low temperature and high temperature.
18. Differentiate between infection and intoxication. Explain these terms with help of suitable examples.
19. Elaborate the spoilage of canned foods and causes of spoilage.
20. Write in details about the following.

- a. Food borne illness.
- b. Bacterial cultures.
- c. Isolation methods of microorganisms

(2 x 15=30 marks)

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**ND4C17TM Public Health Nutrition (T)**  
**(CORE COURSE 17)**  
**Semester IV**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** The course focuses on the promotion of good health through nutrition and the primary prevention of nutrition related illness in the population. It deals with nutritional epidemiology, assessment, interventions and preventive measures. The learners will also be trained on nutrition education techniques.

**Course Overview and Context**

- Gain insight into the national nutrition problems and the efforts taken to overcome them
- Understand the importance of nutrition education and integration of nutrition education with some aspect of diet counselling
- Interpret the impact of technological advancement on general health due to altered food habits/pattern

**Syllabus Content**

**Module I: Demographic Profile and Vital Statistics (10 Hours)**

Population trends in India, Density of population, Age structure, Sex ratio, Family size, Literacy and Education, Life expectancy. Vital Statistics : Infant Mortality (IMR), Birth rate (CBR), Fertility rate, Material mortality rate (MMR), Under 5 mortality rate (U5MR)

**Module II: Food Production and Sufficiency (12 Hours)**

Food production, post- harvest technology, food grain storage, food losses. Food sufficiency, Food requirements verses food availability. Food & Nutritional Security. Food Security Programmes: Public Distribution System (PDS), Antyodaya Anna Yojana (AAY),

Annapurna Scheme, Food for Work Programme.

**Module III: Prevalent Nutrition Problems in India (15 Hours)**

Protein energy malnutrition, obesity, underweight, Anemia, vitamin A deficiency, Iodine deficiency disorders, Rickets, Osteomalacia and osteoporosis, Fluorosis.

**Module IV: Strategies to combat Nutritional Deficiencies (18 Hours)**

Food fortification, Food enrichment, Nutrition and health education, National nutrition Policy & Programmes: (Aims and objectives Short and long term policies and implementation). Vitamin A prophylaxis programme, prophylaxis against nutritional anaemias, control of Iodine deficiency disorders.

**Module V: Supplementary Feeding Programmes (15 Hours)**

Role of ICDS, national & international agencies in combating malnutrition (WHO, FAO, UNICEF, NIN, NFI, FNB, NNMB, CFTRI) Role of food technology in combating malnutrition (development of food mixtures, food fortification, food preservation & new foods). Nutrition Policy and Programme: National Nutrition Policy –Anganwadi - its management, its role in implementation of nutrition policy programme. Functions of Primary Health Centre.

**Module VI: Assessment of Nutritional Status (10 Hours)**

Methods of Nutritional assessment, nutritional anthropometry, growth standards, dietary and clinical assessment, biochemical and radiological assessment. Nutrition monitoring objectives, agencies engaged in nutrition monitoring. Nutritional surveillance: need for nutritional surveillance, key indicators of nutritional surveillance programme.

**Module VII: Nutrition Education (10 Hours)**

Scope of nutrition education, steps in planning, conducting & evaluating nutrition and health education programme. Methods of imparting nutrition education– design messages, mass media, traditional methods. Monitoring and evaluation of effectiveness of nutrition and health education programmes.

**Competencies of the course**

- C1) Study the vital statistics
- C2) Study the demographic profile as a method of assessment
- C3) Identify the factors leading to food loss
- C4) Understand the food security programs
- C5) Identify the effect food security programs
- C6) Recognise the positive and negative impact of technology on agriculture
- C7) Study the symptoms and causes of anaemia
- C8) Study the stages, symptoms and causes of VAD
- C9) Study the causes, symptoms and classification of Iodine Deficiency disease
- C10) Differentiate between forms of PEM and its causes
- C11) Identify the symptoms and cause of fluorosis among the population
- C12) Understand and study the prophylaxis programs against major deficiency diseases of India
- C13) Learn the strategies to prevent deficiencies through agriculture development

- C14) Gain knowledge on fortification, restoration and enrichment to prevent deficiencies  
 C15) Familiarise on functions of primary health centre  
 C16) Study the various intervention programs by national organisations against public health issues  
 C17) Gain knowledge on various intervention programs by international agencies towards public health issues  
 C18) Understand the importance of nutrition education program  
 C19) Study the steps involved in preparing for a nutritional education program  
 C20) Understand assessment of nutritional status  
 C21) Gain knowledge on term safe drinking water and its sources  
 C22) Analyse the need for personal hygiene to prevent infections

**Learning Resources**

**References**

- 1) Michael J. Gibney, Barrie M. Margetts, John M. Kearney, Lenore Arab, (2013), “Public Health Nutrition”, John Wiley & Sons.
- 2) Sari Edelstein, (2010), “Nutrition in Public Health”, Jones & Bartlett Learning.
- 3) Arlene Spark, Lauren M. Dinour, Janel Obenchain, (2015), “Nutrition in Public Health: Principles, Policies, and Practice, Second Edition”, CRC Press.
- 4) Proceedings of Nutrition Society of India, NIN, Hyderabad.
- 5) Technical Reports of WHO.
- 6) Technical Reports of ICMR, New Delhi.

**ND4C17TM Public Health Nutrition**  
**Blue print**

<b>Module</b>	<b>Hours</b>	<b>Mark-3 5/7</b>	<b>Mark-5 6/9</b>	<b>Marks15 2/4</b>
I	10	1	1	-
II	12	1	1	-
III	15	1	2	-
IV	18	-	2	1
V	15	2	2	1
VI	10	1	-	1
VII	10	1	1	1
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- IV**

**Core Course – ND4C17TM Public Health Nutrition**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Brief on any MMR and U5MR.
2. Discuss IDD.
3. What are the functions of a primary health centre
4. Brief on food enrichment.
5. Write on nutrition education channels
6. Write on Annapurna scheme.
7. Discuss key indicators of nutritional surveillance.

(5 x 3 =15 marks)

**Part B**

*Answer any **six** questions not exceeding **two pages***

*Each question carries **five** marks*

8. Brief on role of ICDS to combat deficiencies.
9. Discuss on long term policies to treat and prevent anaemia
10. Explain any two food security programs
11. Explain types of PEM.
12. What are causes and consequences of iron deficiency anaemia.
13. Brief on population trends and sex ratio in the past decade
14. 14. Discuss food fortification under: a. Nutrients b.vehicle.
15. Write on importance of anganwadis as a boon to the country
16. Explain various stages of nutrition education program.

(6 x 5 = 30 marks)

**Part C**

*Answer any **two** questions not exceeding **four pages***

*Each question carries **fifteen** marks*



17. Define nutrition education, plan a nutrition education program for a pregnant woman in a village in Assam( medium selected should be English)
18. What are the causative factors of VAD. Discuss National Prophylaxis Program for prevention of Blindness due to Vitamin A deficiency.
19. Give a detailed account on the assessment of nutritional status.
20. Discuss on role of international agencies in combating malnutrition.

(2 x 15 = 30 marks)

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**ND4C18PM Community Programme**  
**(CORE COURSE 18)**  
**Semester IV**

**Total Credits: 4**

**Total Lecture Hours : 108 (6 hours/ week)**

**Syllabus Content**

**Module 1: Survey**

Conduct a survey in a nearby rural area to detect the prevalence rate of different disease conditions

**Module II: Nutrition awareness class**

Each student should take a class on nutrition/ dietetics in a rural area in collaboration with government/ non- governmental organization

**Module III: Health check-up camp**

Measure and record the weight, height and BMI of the people who come to attend the class.

Record the random glucose level, blood group checking and blood pressure.

Arrange medical check –up camp along with primary health centres.

**Module IV:Anthropometric measurement of children**

Measure and record the weight, height, head circumference of the pre- school children in an institution.

# **Syllabi for Electives**

**ND4EA01TM Health and Fitness (T)**

**(ELECTIVE 1)**

**Semester IV**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/Week)**

**Aim of the course:** This course intended to provide knowledge on health and fitness. It aims at attaining broader understanding about different systems affected during exercise. The students are able to gain insight on the pros and cons of dietary modification in relation to exercise and physical fitness.

**Course Overview and Context**

- Know the components of health and fitness and the role of nutrition in these.
- Understand the effect of exercise on different systems.
- Make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.

**Syllabus Content**

**Module 1: Introduction to Fitness and Training Benefits of Exercise (10 Hours)**

Parameters of fitness, fitness tests, Holistic approach to management of health and fitness including diet and exercise (Aerobic and anaerobic), energy production, Alternative systems for Health and fitness.

**Module II: Musculo-skeletal Systems (12 Hours)**

Types of Skeletal muscles fibre, Effect of anaerobic exercise on musculoskeletal system, Endurance, strength/ Power, Speed, Coordination, agility, balance.

**Module III: Cardio--respiratory System (14 Hours)**

Effect of aerobic exercise on heart rate, blood pressure and lung function, Assessment of Cardio-respiratory fitness using Maximum aerobic capacity (VO<sub>2</sub>max), Assessment of coronary risk profile- RISKO factor , Recognizing symptoms to stop any exercise. Emergency procedures.

**Module IV: Substrate for exercise (8 Hours)**

Utilization of lipid and carbohydrate in relation to exercise type, intensity and duration.

**Module V: Sports Nutrition (14 Hours)**

Overview, Nutritional requirements and recommendations, pre event and post event meal, water and electrolyte balance, Regime of hydration and dehydration. Symptoms and effect of dehydration. Sports Drink.

**Module VI: Effect of Specific Nutrients on Work Performance (12 Hours)**

Nutritional requirements during exercise, Effect of specific nutrients during exercise-carbohydrate, protein, fat, iron, calcium, vitamins, consumption pattern -Merits and demerits of nutrigenic aids and supplements. Ergogenic Aids-physical, chemical and mechanical, Use and Abuse of Dietary Supplements.

**Module VII: Exercise prescription in Special Conditions (10 Hours)**

Exercise regime for pre and post-natal fitness, Obesity and weight control – Prevention of weight cycling, Diabetes, Hypertension and Coronary Heart Disease, Osteo arthritis and Osteoporosis, Spondylitis Back aches.

**Module VIII: Formulating dietary guidelines (10 Hours)**

Fitness and health Obesity management and Critically analyzing different established weight reduction diet plans. Management of diabetes mellitus and Management of CVD

**Competencies of the course:**

- C1) Identify the components of health and fitness
- C2) Gain knowledge on changes of exercise on musculo skeletal system
- C4) Understand the principles of dietary management during health and fitness
- C5) Study the need of sports drink on exercise
- C6) Understand the role of substrates on exercise
- C7) Learn the need of exercise in different disease conditions
- C8) Study the effect of water and electrolyte balance during exercise
- C9) Study the effect of specific nutrients on work performance
- C10) Understand the effect of exercise on cardio- respiratory system

**Learning Resources**

**References**

- 1) Mahan, L.K. & Ecott-Stump, S. (2000): Krause's Food, Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
- 2)Sizer, F. & Whitney, E. (2000): Nutrition – Concepts & Controversies, 8th Edition, Wadsworth Thomson Learning.
- 3) Whitney, E.N. & Rolfes, S.R. (1999): Understanding Nutrition, 8th Edition, West/Wadsworth, An International Thomson Publishing Co.
- 4) Ira Wolinsky (Ed) (1998): Nutrition in Exercise and Sports, 3rd Edition, CRC Press.
- 5) Parizkova, J. Nutrition, physical activity and health in early life, Ed. Wolinsky, I., CRC Press.
- 6) Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999): Modern Nutrition in Health & Disease, 9th Edition, Williams & Wilkins.
- 7) McArdle, W. Katch, F. and Katch, V. (1996) Exercise Physiology. Energy, Nutrition and Human Performance, 4th edition, Williams and Wilkins, Philadelphia.

**ND4EA01TM Health and Fitness (T)**

Blue print

<b>Module</b>	<b>Hours</b>	<b>Mark-3</b> <i>5/7</i>	<b>Mark-5</b> <i>6/9</i>	<b>Marks15</b> <i>2/4</i>
I	10	1	2	-
II	12	1	1	-
III	14	1	1	-
IV	8	-	-	1
V	14	1	1	-
VI	12	1	2	1
VII	10	1	2	1
VIII	10	-	1	1
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- IV**

**Core Course – ND4EA01TM Health and Fitness**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one** page*

*Each question carries **three** marks*

1. Discuss the components of physical fitness.

2. Explain different types of diets for weight reduction.
3. How is the lung capacity improved by exercise?
4. Brief on the effect of exercise on bone diseases.
5. State the role of nutrients on exercise
6. Discuss dehydration and its symptoms.
7. Brief on alternative methods for health and fitness.

(5 x 3 = 15 marks)

### **Part B**

*Answer any **six** questions not exceeding **two** pages*

*Each question carries **five** marks*

8. Write effect of water and electrolytes during exercise.
9. Discuss effect of micronutrients during exercise.
10. What are the advantages and disadvantages of exercise on diabetes?
11. How will you manage the weight changes in post- natal condition?
12. Describe the assessment procedures of coronary disease risk and emergency procedures followed.
13. Define nutrogenic aids. Write the merits and demerits.
14. Write a note on energy production during exercise.
15. Discuss the parameters of fitness
16. Brief on energy requirement for different types of sports activities.

(6 x 5 = 30 marks)

### **Part C**

*Answer any **two** questions not exceeding **four** pages*

*Each question carries **fifteen** marks*

21. Discuss the role of exercise prescription for various cardiac diseases.
22. Explain the role of exercise and different diets for weight reduction.
23. Describe the utilization of lipids and carbohydrates during exercise
24. Elaborate on ergogenic aids. Explain the uses and misuses of the same.

(2 x 15 = 30 marks)

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**ND4EA02TM Paediatric Nutrition (T)**  
**(Elective II)**  
**Semester IV**

**Total Credits: 4**

**Total Lecture Hours: 90 (5 Hours/ Week)**

**Aim of the course:** This course proposes to give thorough knowledge on nutritional assessment of paediatrics. It provides a detailed understanding in dietary management of children with medical conditions.

**Course Overview and Context**

- Recognise the importance of nutritional care and nourishment of children with various ailments
- Understand the specific needs of children and the effects of various diseases on nutritional status and nutritional requirements at these stages of the life cycle
- Be competent to recommend / provide appropriate nutritional care based on pathophysiology, prevention/ and treatment of the various diet-related disorders/ diseases

**Syllabus Content**

**Module 1: Paediatric Nutritional Assessment (12 Hours)**

Anthropometric measurements, biochemical parameters, clinical and dietary data. Measuring, recording and plotting growth chart

**Module II: Nutritional considerations for LBW and preterm children (12 Hours)**

Overview, Nutritional management and feeding options for pre mature children and children with developmental disabilities, paediatric problems- congenital heart disease, lactose intolerance, celiac disease

**Module III: Nutrition concerns in childhood (14 Hours)**

Childhood Obesity; Underweight and Under nutrition- short term and long term consequences , Failure to thrive; Growth faltering and detection Mineral and vitamin deficiencies, Dental caries, Allergies, Attention-deficit hyperactivity disorder

**Module IV: Inborn Errors of Metabolism (14 Hours)**

Disorders of amino acid metabolism- PKU, Maple syrup urine disease, Homocystinemia Disorders of CHO metabolism- Galactosemia, Glycogen storedisorder , other disorders- Wilson's disease. Nutritional Care Management of these conditions.

**Module V:Gastrointestinal Diseases and Disorder (13 Hours)**

Diarrhea, gluten enteropathy, inflammatory bowel disease, constipation and fat absorption

test diet, calculation of fluids& electrolytes- both deficit and maintenance and management of caloric intake.

**Module VI: Neurological and Pulmonary Diseases in Children (10 Hours)**  
Epilepsy (ketogenic diets) , cystic fibrosis

**Module VII: Renal Disease and Disorder in Children (14 Hours)**  
Nephrotic syndrome, chronic renal failure and different types of dialysis- calculation of fluids& electrolytes- both deficit and maintenance and management of caloric intake.

#### **Competencies of the course**

- C1) Identify the special assessment procedures of children
- C2) Gain knowledge on nutritional requirement of LBW children
- C4) Understand the different disease conditions present in childhood
- C5) Study the need nutrition in these conditions
- C6) Understand the prominent in born errors present during childhood
- C7) Learn the need of nutrients in gastro intestinal diseases
- C8) Study the effect of diet on epilepsy and cystic fibrosis
- C9) Study the nutritional requirement in renal diseases
- C10) Understand the effect of diet on dialysis

#### **Learning Resources**

##### **References**

- 1) Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
- 2) Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
- 3) Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
- 4) Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
- 5) Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
- 6) Davis, J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd Edition, W.B. Saunders Co.
- 7) Walker, W.A. and Watkins, J.B. (Ed) (1985): Nutrition in Pediatrics, Boston, Little, Brown & Co.
- 8) Guyton, A.C. and Hall, J.E. (1999): Textbook of Medical Physiology, 9th Edition, W.B. Saunders Co.
- 9) Ritchie, A.C. (1990): Boyd's Textbook of Pathology, 9th Edition, Lea and Febiger, Philadelphia.
- 10) World Cancer Research Fund (1997). Food, Nutrition and the Prevention of Cancer- A Global perspective, Washington E.D. WCRF.
- 11) Kumar, V. (1996): Aging – Indian Perspective and Global Scenario. Proceedings of International Symposium of Gerontology and Seventh Conference of the Association of Gerontology (India).



- 12) Bagchi, K. &Puri, S. (Ed) (1999): Diet and Aging – Exploring Some Facets. Soc. for Gerontological Research, New Delhi and Help Age India, New Delhi.
- 13) Chaudhary, A. (Ed) (2001): Active Aging in the New Millennium, Pub. Anugraha, Delhi

**ND4EA02TM Paediatric Nutrition**

Blue print

<b>Module</b>	<b>Hours</b>	<b>Mark-3 5/7</b>	<b>Mark-5 6/9</b>	<b>Marks15 2/4</b>
I	12	1	2	-
II	12	1	1	1
III	14	2	2	-
IV	14	-	3	1
V	13	2	-	1
VI	10	1	1	-
VII	14	-	-	1
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- IV**

**Core Course – ND4EA02TM Paediatric Nutrition**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any five questions not exceeding one page*

*Each question carries three marks*

1. Discuss and write a note on growth chart.
2. Explain on lactose intolerance.
3. Write a short note on cystic fibrosis.
4. Brief on childhood obesity.
5. How can we manage diarrheic condition in children?
6. Discuss on constipation and fat absorption test diet.

7. Brief on ADHD.

(5 x 3 =15 marks)

**Part B**

*Answer any **six** questions not exceeding **two** pages*

*Each question carries **five** marks*

8. Write a note on glycogen storage disease.
9. How can we detect the nutritional deficiencies? 3
10. Explain on epilepsy and benefit of ketogenic diet.
11. How will you manage the weight changes in post- natal condition?
12. Discuss on undernutrition and overnutrition consequences.
13. Briefly explain MSUD and explain the nutritional management
14. Write a note on nutritional considerations of preterm infants.
15. Describe the assessment procedures for children?
16. Brief on Wilson's disease and nutritional management.

(6 x 5 = 30 marks)

**Part C**

*Answer any **two** questions not exceeding **four** pages*

*Each question carries **fifteen** marks*

17. Discuss the nutritional management and feeding options in LBW babies.
18. Explain any five inborn errors of metabolism in children.
19. Describe the following
  - a. Gluten enteropathy
  - b. Inflammatory bowel disease
  - c. Constipation.
20. Elaborate on nutritional management of nephritic syndrome.

(2 x 15 =30 marks)

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**ND4EA03 TM Geriatric Nutrition (T)**  
**(ELECTIVE 3)**  
**Semester IV**

**Total Credits: 4**

**Total Lecture Hours: 90(5 Hours/ Week)**

**Aim of the course:** This course intended to provide knowledge on health and fitness. It aims at attaining broader understanding about different systems affected during exercise. The students are able to gain insight on the pros and cons of dietary modification in relation to exercise and physical fitness.

**Course Overview and Context**

- Know the components of health and fitness and the role of nutrition in these.
- Understand the effect of exercise on different systems.
- Make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.

**Syllabus Content**

**Module 1: The ageing process (20 Hours)**

Physical, Physiological, metabolic body composition changes and impact on health and nutritional status, Socio-psychological aspects of ageing-special problems of elderly women.

**Module II: Nutritional and health status of elderly (20 Hours)**

Nutritional assessment methods and tools, Nutritional changes and requirement, Factors influencing food and nutrient intake, health status including lifestyle pattern, medication, psychosocial aspects.

**Module III: Chronic diseases (20 Hours)**

Chronic degenerative diseases and nutritional problems of the elderly-their pathogenesis, management, prevention and control, Nutritional support- parenteral, enteral and oral feedings, health and feeding problems.

**Module IV: Policies and programmes (16 Hours)**

Policies and programmes of the government and NGO sector pertaining to the elderly.

**Module V: Promoting fitness and well-being (14 Hours)**

Use of various modern and traditional approaches to promote fitness and well being

**Competencies of the course**

- C1) Know the physiological and physical changes on elderly people.
- C2) Analyse nutrition assessment process of old age
- C3) Achieve knowledge regarding nutritional changes and requirement of elderly
- C4) Understand various common chronic diseases
- C5) Analyse the governmental policies for elderly.
- C6) Know non-governmental beneficial policies for elderly

C7) Gain knowledge on wellness and fitness

**Learning Resources**

**References**

- 1) Sharma, O.P. (Ed.) (1999): Geriatric Care in India – Geriatrics and Gerontology: A Textbook, M/s. ANB Publishers.
- 2) Care of the Elderly: A family approach, New York, Pergamon Press. 26. Watson, R. R. (ed) (2000) Handbook of Nutrition in the Aged. 3rd edition. CRC Press. Boca Raton
- 3) Nutrition Screening Initiative (1991 and 1992). Nutrition Screening Manual for Professionals Caring for Older Americans. Washington, D.C. Green Margolis, Mitchell, Burns and Associates
- 4) Chernoff, R. (ed) (1991). Geriatric Nutrition: The Health Professionals' Handbook, Gaithersburg, MD: Aspen
- 5) The Nutrition Screening Initiative (1994). Incorporating Nutrition Screening and Interventions into Medical Practice: A Monograph for Physicians.
- 6) Watson, R.R. (ed) (1985) CRC Handbook of Vitamins in the Aged ERC Press, Boca Raton, Florida
- 7) Bock, G.R.; and Whelen, J. (eds) The Childhood Environment and Adult Disease. Chichester, U.K. Wiley
- 8) Berg, R.L. and Casells, J.S. (1990) The Second Fifty Years: Promoting Health and Preventing Disability. Washington E.C. National Academy Press.

**ND4EA03TM Geriatric Nutrition**

Blue print

<b>Module</b>	<b>Hours</b>	<b>Mark-3</b> <b>5/7</b>	<b>Mark-5</b> <b>6/9</b>	<b>Marks15</b> <b>2/4</b>
I	20	2	1	1
II	20	1	3	1
III	20	2	3	1
IV	16	1	1	1
V	14	1	1	-
<b>Total</b>	<b>90</b>	<b>7</b>	<b>9</b>	<b>4</b>

**Model Question Paper**

**ST.TERESA'S COLLEGE, ERNAKULAM**

**(Autonomous)**

**MASTER'S PROGRAMME IN CLINICAL NUTRITION AND DIETETICS**

**Semester- IV**

**Core Course – ND4EA03TM Geriatric Nutrition**

**Time: 3 hrs**

**Max.Marks:75**

**Part A**

*Answer any **five** questions not exceeding **one page***

*Each question carries **three** marks*

1. Discuss physiological aspect of ageing process.
2. Brief on traditional approaches in promoting fitness.
3. Write a short note NGO sectors.
4. Brief on nutritional problems in elderly.
5. Which are factors influencing food and nutrient intake?
6. Discuss on enteral nutrition feeding formulations.
7. Explain on socio – economic factors in ageing.

(5 x 3 =15 marks)

**Part B**

*Answer any **six** questions not exceeding **two pages***

*Each question carries **five** marks*

8. Write a note on body composition changes in geriatric patients.
9. Brief on health status problems faced by old age.
10. Explain on oral feeding procedures.
11. How will you manage the degenerative diseases in elderly?
12. Discuss on modern and traditional approaches that promote wellbeing in old age.
13. Briefly explain the function of Government sectors in pertaining geriatrics.
14. Write a note on nutritional considerations in elderly.
15. Describe the assessment procedures for geriatrics.
16. How can we detect the nutritional deficiencies?

(6 x 5 = 30 marks)

**Part C**

*Answer any **two** questions not exceeding **four pages***

*Each question carries **fifteen** marks*

17. Discuss the nutritional management and feeding options in elderly.
18. Explain polices that are developed for old age well-being.
19. Describe the following changes in geriatrics
  - a. Physical
  - b. Physiological
  - c. Metabolic
20. Elaborate on nutritional changes and management in old age.

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# **Syllabus for Registered Dietician Training**

### **ND01PM-Registered Dietician Training**

**Duration: 6 months**

#### **Syllabus Content**

- **Nutrition Assessment:** (SGA /MUST/MNA/SOAP /CASE SPECIFIC) of 70 cases from the various departments, and detailed case study of 30 patients-association ABCD (SGA /MUST/MNA/SOAP /Case Specific), 3 Day Recall, Food Exchange Calculations, and Dietary Recommendations and Conclusion
- **Completion of the RD Residency Training** as per RD Internship of Indian Dietetic Association (IDA) Log book is compulsory (emphasis to be given to the following: )
  1. Anaemia
  2. Pregnancy and Lactation
  3. Enteral and Parenteral nutrition
  4. Cancer patient
    - i ) Chemo Therapy ii) Radiation Therapy
  5. Cardio vascular diseases
  6. Gastro Intestinal Diseases
  7. Liver Diseases
  8. Pancreatitis
  9. Pediatric- i ) Inborn Errors of Metabolism- PKU/MSUD/GSD/GA ii) T-1DM iii) Underweight child iv) Feeding difficulties v ) Failure to thrive vi ) Overweight & Obesity vii) Nephritis, Chronic Renal Failure viii) Cancer
  10. Diabetes Mellitus-i) T-1 DM ii) T-2DM iii ) GDM iv) Diabetes With complications
  11. Weight management: i) Overweight and Obesity: Adult cases ii) Underweight: Adult cases
  12. Renal Diseases- Acute and Chronic Renal Failure
    - i) Conservative treatment ii) Renal replacement therapy
      - a) Dialysis -Hemodialysis, Peritoneal dialysis b) Transplant
  13. Critically ill in ICU

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