ST.FRANCIS DEGREE COLLEGE FOR WOMEN BEGUMPET

HYDERABAD-500016

(AN AUTONOMOUS COLLEGE OF OSMANIA UNIVERSITY)

DEPARTMENT OF NUTRITION

DSC- 9	ADVANCED NUTRITION SEMESTER- III	45 HRS

Module –1 Emerging Food Trends

Module –2 Immunology and Nutrition Associated with Immunity

Module –3 Nutraceuticals, Functional Foods and Antioxidants

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

SEMESTER – III

ADVANCED NUTRITION

1. Course Description:

Programme : M.Sc.
Course Code : P24/NUT/DSC /301
Course Type : DSC 9
No. of credits : 3

Max. Hours : 45
Hours Per Week: 3
Max. Marks : 100

2. Course Objectives

- To familiarize students with the recent advances in nutrition.
- To impart knowledge on nutraceuticals and functional foods.

3. Course Outcomes

After the successful completion of the course, the student will be able to:
CO 1: Remember the upcoming trends and technological changes in the field of Nutrition.
CO 2: Understand the immunology and types of allergies
CO 3: Analyze the role of different nutraceuticals, functional foods and antioxidants on human health.

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4. Course Content

MODULE I: EMERGING FOOD TRENDS (15 Hrs)

1.1 Biotechnology in Food-Genetically Modified foods – techniques, examples, Bio Fortification-pathway, methods- Agronomic approach, conventional breeding and molecular breeding, genetic modification

1.2 Processed and Convenience Foods-Extruded Foods- Types, Advantages and Disadvantages, Textured vegetable proteins (meat substitutes/ analogs), Novel proteins- mycoprotein, leaf protein extracts, Single cell protein, insects, Space foods- types, challenges

1.3 Prebiotics, probiotics and organic foods-Probiotics, Prebiotics, Synbiotics, Symbiotics, Food Applications of Prebiotics, Benefits of Probiotics, Organic foods – organic farming- advantages and limitations, organic manures and biopesticides , organic livestock and poultry

MODULE II: IMMUNOLOGY AND NUTRITION ASSOCIATED WITH IMMUNITY

(15 Hrs)

2.1 Immunology and related systems-Active immunity: Humoral, cellular and combination of both, Passive immunity: normal human Ig, Specific human Ig, Immunoglobulins: IgG, IgM, IgA, IgD, IgE

2.2 Food Hypersensitivity and Allergies: Definition types: immediate, cytotoxic, immune complex mediated and delayed anaphylaxis with examples, Classification: immune mediated and non-immune mediated

2.3 Nutrigenomics: Principles and Basis of Nutrigenomics, Tools of Nutrigenomics- Genomics, Proteiomics, metabolomics, Transcriptomics, Interaction between nutrient and Gene, Role of nutrigenomics on metabolic disorders like CVD, Lipid metabolism and Hypertension, Inflammatory disorders, Cancer and Diabetes, Genetic determinants of Obesity, Potential role of different nutrients and hormones (leptin and Ghrelin) in modulating obesity

MODULE III: NEUTRACEUTICALS, FUNCTIONAL FOODS AND ANTIOXIDANTS

(15 Hrs)

3.1 Nutraceuticals as Science: Definition, Historical Perspective of Nutraceuticals, Classification of Nutraceuticals- Isoprenoids, Glucocyanovates and phytosterols, Polyphenols: Terpenoids, Carotenoids: Lycopene, Carotene, Curcumin, Lignans, Resveratrol, Scope and Future Prospects, Nutraceutical Supplements from Plant Sources and Animal Source, Nutraceutical Rich Supplements - Bee Pollen, Caffeine, Green Tea, Grape Tea, Wheat Grass, Lecithin

3.2 Functional foods-Perspective for Food Applications: Non-Digestible Carbohydrates / Oligosaccharides : Dietary Fibre, Resistant starch, Perspective for Food Applications: Omega -3 Fatty acids, Conjugated Linoleic acid

3.3 Antioxidants- Formation of free radicals, Reactive oxygen species, Oxidative stress, Antioxidant-definition and mechanism of action, Classification of antioxidants-Endogenous: Super Oxide Dismutase, Catalases, Glutathione Reductase, Peroxidases , Exogenous: Retinol. Beta Carotene,

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Ascorbic acid and tocopherol, Retinol. Beta Carotene, Ascorbic acid and tocopherol in prevention of cancer, CVD, aging and Inflammation.

5. Reference Books:

1. Nutrition and Metabolism – Michael J. Gibney, MarinosElia, OlleLjungqvist,
2. Julie Dowsett (Eds.) – Nutrition Society Textbook series, Blackwell Publishers.
3. Nutrition Science – B Sri Lakshmi, New Age International Publishers.
4. Normal and Therapeutic Nutrition – Robinson & Lawler, 17th edition, Mac Millan Publishers.
5. Text Book of Human Nutrition – Mahtab S Bamji, N PrahladRao, Vinodini Reddy, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd.
6. Social and Preventive Medicine – Park & Park.
7. Modern Nutrition in Health & Disease – Eds – Maurice E. Shils, James A.
8. Olson, Moshe Shike, 8th edition, Vol I and II, Williams & Wilkins Publication.
9. Human Nutrition – Geissler & Powers, 11th edition, Elsevier Publications.

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6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
Global	The course gives an understanding of the concepts of advanced foods in the food industry and help them develop a deep knowledge about functional foods, nutraceuticals and antioxidants. All this information can help them formulate new food products.

b) Components on Skill Development/Entrepreneurship/Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
ED	1	Videos on the advanced technologies
ED	2	Presentations
ED	3	Survey of nutraceutical products available in the market

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Quiz/ case studies	Experiential Learning
3.	Group Discussion	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
CO3	CIA-1 Seminar/ assignment	
	CIA 2- Mind maps	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE X 12 M = 36 M			**3Q**	
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	What are genetically modified foods and mention in detail for its need?	**CO 1**	**I**
2	**Module 1**	Define extruded foods with examples. What are the advantages and disadvantages of extruded foods?	**CO 1**	**I**
3	**Module 2**	What are nutrigenomics? Describe their role for metabolic disorders	**CO 2**	**I**
4	**Module 2**	Explain the different types of food allergies with examples.	**CO 2**	**V**
5	**Module 3**	What are nutraceuticals. Classify them. Give one example of animal and plant nutraceutical.	**CO 3**	**I and II**
6	**Module 3**	What are antioxidants. Give classification. Explain its role in metabolic disorders.	**CO 3**	**II and V**
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have **ONE** question from **each** module)			**4 Q X 6 M = 24 M**	
7	**Module 1**	Fortification	**CO 1**	**II**
8	**Module 1**	Space foods	**CO 1**	**II**
9	**Module 2**	Active and passive immunity	**CO 2**	**II**
10	**Module 2**	Proteomics	**CO 2**	**II**
11	**Module 3**	Dietary fiber	**CO 3**	**II**
12	**Module 3**	Beta Carotene	**CO 3**	**II**

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SEMESTER -III
HOSPITAL INTERNSHIP IN NUTRITION AND DIETETICS -PRACTICAL

Programme : M.Sc.
Course Code: P24/NUT/DSC/301/P
Type of course:DSC-9
No. of credits : 2

Max.Hours : 30
Hours per week: 4
Max.Marks: 50

Course Objectives:

1. Internship is a phase of training wherein a graduate is expected to conduct actual practice of diet management and health care and acquire skills under supervision of a Practicing dietician so that he/she may become capable of functioning independently.

Course Outcomes:

- Manage Diet prescription independently for clinically common disease conditions encountered to higher level.
- Use of parenteral feeds and nasal /tube feedings
- Manage– Medical, Surgical, Obstetric, Neonatal and Paediatric specialties
- Monitoring the National Health Programmes and Schemes, oriented to provide promotive, preventive, curative and rehabilitative health care services to the community.
- Develop leadership qualities to function effectively as a leader of the Dietetics team organized to deliver the health and family welfare services in existing socio-economic, political and cultural environment.
- Render services to chronically sick and disabled (both physical and mental) and to communicate effectively with patient and the community
- Acquire adequate communication skills for proper interactions with:

a. Patients and Attendants
b. Seniors
c. Peer Group
d. Other paramedical workers
e. Acquire ability, to judiciously select appropriate diet prescription as per clinical situation, patient's likes and dislikes and priorities

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Period of Internship: 45 days internship in a multispecialty hospital with a dietary department.
Case Studies: Five case studies of different diseased conditions have to be taken up during the Internship.
Report to be submitted in the hospital: Submit a bound copy of the word-processed, printed internship report to the dietician for evaluation at the end of the internship.

Prepared by	Checked &Verified by	Approved by
Dr. Poonam Singhal Name and Signature of the teaching faculty	Tabitha Ramona NameandSignatureofHoD	Dr. Uma Joseph NameandSignatureof Principal

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DEPARTMENT OF NUTRITION

DSE- 1	DIET COUNSELING SKILLS SEMESTER- III	45 HRS

Module –1 Basics Of Diet Counseling

Module –2 Diet Counseling at Hospital and Community Level

Module –3 Introducing to Psychology and Counseling

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

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SEMESTER – III
DIET COUNSELING SKILLS

1. Course Description
Programme: M.Sc.
Course Code: P24/NUT/DSE/301
Course Type : DSE -1
No. of credits: 3

Max. Hours: 45
Hours Per Week: 3
Max. Marks:100

2. Course Objectives:

- To familiarize students with diet counseling skills and ethical considerations involved in basic principles of dietetics
- To train students in various psychological assessment techniques

3. Course Outcomes:

After the successful completion of the course, the student will be able to:

CO1: Understand essence to communication and visual aid in the process of counseling.
CO2: Create skills to conduct detailed nutritional assessments at administrative, community and hospital level to assess health.
CO 3: Analyze the role of psychology in counseling patients

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4. Course Content

MODULE 1: BASICS OF DIET COUNSELING (15 Hrs)

1.1. Introduction: Diet Counseling-Definition, significance, Ethical principles of counseling.Role of Counselor & Counselee. Role ofDietician at Hospital as a part of medical team, community and research team.

1.2. Nutrition Care Plan: Nutrition assessment, nutrition diagnosis- 24 hour recall, list of likes and dislikes, lifestyle.Nutrition Intervention, Monitoring and Evaluation.

1.3. Communication: Communication process in counseling- verbal and non-verbal, problems in communication. Materials for counseling -Models, charts, posters, AV aids, Handouts etc.

Hospital case studies-Medical Terminology, The Medical record, reading and understanding the medical case sheet, Medical history and patient profile case study assessment and evaluation, Impact of counseling on health of individuals.

MODULE2: DIET COUNSELING AT HOSPITAL AND COMMUNITY LEVEL(15 Hrs)

2.1. Diet counseling for Obese people :Theories and Facts About Nutrition Obesity, Inappropriate Eating Behaviors , Assessment of Eating Behaviors ,Adherence with Weight-Loss Programs , Treatment Strategies.

2.2 Diet counseling for Diabetics &CVD :Theories and Facts about Nutrition and Type 1 Diabetes & Type 2 Diabetes and CVD .Inappropriate Eating Behaviors , Assessment of Eating Behaviors,Dietary Intervention Research on Adherence to Eating Patterns , Treatment Strategies.

2.3 Evaluation and Follow-Up :Evaluation of Counselor Progress and client progress,Strategies to Maintain Dietary Adherence ,Reinstitution of Intervention or Treatment , The Termination Process.

MODULE 3: INTRODUCING TO PSYCHOLOGY AND COUNSELING (15 Hrs)

3.1. Introduction to Psychology: Definition , Nature and Scope , Attention and perception – Types of attention and factors influencing attention , principles of perceptual organization and abnormalities in perception.

3.2. Learning methods :Definition and Types of learning, Types of memory, Forgetting and its causes,Motivation and Emotion- Types of motives, types of emotions, emotional expression , Personality- nature and definition , factors influencing personality, Psycho analytic theory of personality.

3.3. Approaches to Counseling: Nature and goals of Counseling, Principles of counseling, Principles of test construction and standardization- item analysis, reliability, Validity Psychological tests – Types: individual, group, performance, verbal and non verbal. Psycho analytic approach,Behavioristic approach, Humanistic approach.

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5. Reference Books:

1. Bali ,P.A(2001) care of the Elderly in India. Changing configurations, Indian Institute of Advanced study,shimla
2. Bhai, L.T,(2002) Ageing on Indian perspective, Decent Books Pubs, New Delhi
3. Dietetics 5th edition by B.Srilakshmi
4. Singh. R. (1994)Educational and Vocational Guidance, Common Wealth pub, New Delhi
5. Jacobs,M (2010) Psychodynamic Counselling in Action (4th edition) Sage publications, New Delhi
6. Maerns and Thorne (2007) Person-centered Counselling in Action (3rd edition),Sage publications, New Delhi
7. Rao ,S.N.(1991) counseling and Guidance, Tata McGraw Hill Pub, New Delhi
8. Trower, P, Jones, J, Dryden, W and Casey, A (2011) Cognitive BehaviouralCounselling in Action (2nd edition) ,Sage pub, New Delhi.

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6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Global	Diet counseling is a combination of nutrition expertise and psychological skills delivered by a trained dietitian. Diet counselor's role is no longer seen as mere information on dispenser but rather as an agent for changing food and eating behavior for better health.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1	Help students to prepare various teaching aids which will help in effective counseling sessions..
EMP	2 , 3	Good communication and counseling skills will help in .counseling patients at a hospital or a Clinic.

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Food samples testing	Experiential Learning
3.	Group Discussion	Participative Learning

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8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
CO3	CIA-2 Teaching Aids	
	CIA -2 Role Play	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE **3Q X 12 M = 36 M**				
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	Explain the role of a dietitian in a hospital setting. What is the goal of counseling individuals.	**CO 1**	**II**
2	**Module 1**	What is communication, what are the different practices used in communication.	**CO 1**	**I**
3	**Module 2**	Explain the steps involved in Evaluation and follow up process while counseling a patient.	**CO 2**	**II**
4	**Module 2**	How is Diet counseling useful in clinical conditions? Explain the counseling steps for an obese person.	**CO 2**	**I**
5	**Module 3**	What are the types of memory and learning, what are the factors that affect an individual's	**CO 3**	**I**
6	**Module 3**	Elaborate the various approaches in the counseling process	**CO 3**	**VI**
SECTION B - ANSWER ANY 4 OUT OF 6 **(To compulsorily have ONE question from each module)**			**4 Q X 6 M = 24 M**	
7	**Module 1**	Define AV aids	**CO 1**	**I**
8	**Module 1**	Explain 24-hour dietary recall	**CO 1**	**II**
9	**Module 2**	Create patient feedback	**CO 2**	**VI**
10	**Module 2**	How should Diet counseling be done for mother and child care	**CO 2**	**I**
11	**Module 3**	Illustrate Listening skills	**CO 3**	**II**
12	**Module 3**	Describe Goal setting	**CO 3**	**I**

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SEMESTER III
DIET AND COUNSELING SKILLS-PRACTICAL
INTERNSHIP - CASE STUDIES PRESENTATION

Programme : M.Sc.
Course Code: P24/NUT/DSE/301/P
Type of course: DSE
No. of credits : 2

Max.Hours : 30
Hours per week: 4
Max.Marks: 50

Course Objectives:

1. To familiarize the students with diet counseling skills for normal and therapeutic diets
2. To acquaint the students with practical approach towards nutrition education and follow up of cases

1. Writing articles for counseling- preparing brochures, pamphlets

2. Need based programme- planning, organizingcounseling sessions for particular age group, with specific disease

Presentation of case studies related to

- Diabetes
- Obesity
- Cvd
- Renal
- Liver
- Pancreas
- Hormones- PCOS/ thyroid
- GI Tracts
- Paediatrics
- Burns
- Surgery
- Emergencies- accident
- Fevers / transplants

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1. **Report to be submitted in the Department**: Submit a bound copy of the word-processed, printed internship report to the programme in charge for necessary action after the internship.

2. **Presentation and Viva-voce**: Students shall give a presentation on their internship.

Prepared by	Checked &Verified by	Approved by
Ms. Tabitha Ramona Name and Signature of the teaching faculty	Ms. Tabitha Ramona Name and Signatureof HoD	Dr. Uma Joseph Name and Signature of Principal

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DEPARTMENT OF NUTRITION

DSC- 10	FOOD PRODUCT DEVELOPMENT SEMESTER- III	45 HRS

Module –1 Food Product Development And Entrepreneurship

Module –2 Evaluation of Food Quality

Module –3 Food Product Labeling and Food Packaging

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

SEMESTER – III
FOOD PRODUCT DEVELOPMENT

1. Course Description:

Programme: M.Sc.
Course Code: P24/NUT/DSC/302
Course Type: DSC-10
No. of credits: 3

Max. Hours: 45
Hours Per Week: 3
Max. Marks: 100

2. Course Objectives:

- To understand the concept of development of a new product and prepare new products
- To help students understand the concept of food packaging and labeling a new food product.

3. Course Outcome:

After the successful completion of the course, the student will be able to:

CO1: To understand the basics of new food development and standardization

CO2: To understand the subjective and objective evaluation techniques of foods

CO3: To analyze the food labels and different types of food packaging on food products

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4. Course content

MODULE I: FOOD PRODUCT DEVELOPMENT AND ENTREPRENEURSHIP (15Hrs)

1.1 New Product Development-Definition and Types of food product development, Line extension- additions, improvements, repositioning and cost reductions; me too (a copy of existing successful product);New to the world, Reasons for food product development: technological, health, environmental concerns, convenience and cost, company profit, specialized application

1.2 Steps in food product development and Standardization-Steps in food product development: Idea generation, Screening, feasibility, regulation technology, formulation, ingredients, processing, facilities, Packaging, distribution, shelf life, safety and finances, Standardization of food product:Definition, formulation and standardization of recipes, Steps involved in standardization, Significance of food standardization

1.3 Entrepreneurship - Definition, Types, Classification, Qualities of an entrepreneur, Challenges of women entrepreneur, Institutional support to Entrepreneur- SIDCO, SSIB, SIDO, IDBI

MODULE II EVALUATION OF FOOD QUALITY (15Hrs)

2.1Sensory Evaluation of foods-Definition, Sensory characteristics of food: Appearance (colour), Flavor, texture, psychological factors, sensory Tests: Importance of testing food quality, trained panel members, testing laboratory preparation of samples, Techniques of smelling , tasting and testing time, design of experiment, Score card

2.2Subjective evaluation techniques/ Types of tests-Difference tests: paired comparison test, duo-trio test, triangle test, Rating tests – Ranking, Single sample, Two sample and Multiple sample, difference tests, Hedonic scaling, Numerical scoring, Composite scoring, Sensitivity tests : threshold test , dilution test

2.3 Objective tests to assess sensory properties of foods-Physical methods: Test volume, moisture, texture Viscosity, appearance, Chemical methods : Nutrient analysis, sugar concentration, saltiness and flavor, PH, Proximate composition and analysis of food constituents, Measurement of color and texture

MODULE III FOOD PRODUCT LABELING AND FOOD PACKAGING (15Hrs)

3.1Food product labeling-Product labeling: Definition, Characteristics of effective labels , purpose, Types- Brand label, grade label, descriptive label, informative label and Functions of labeling, Nutrition labeling : Definition, Types/categories of nutrition labeling: nutrition claims, nutrient content claims, comparative claim, nutrient function claim ; Guiding principles of nutrition labeling : Codex Guidelines, Labeling provisions in existing food laws in FSSAI 2020; Marketing the animal origin foods, labeling nutraceuticals,

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3.2 Food packaging: Importance, Definition, Principles of packaging, Classification, Types of packaging material: Metal, glass, Paper, plastic, edible packaging material, miscellaneous packaging materials

3.3 Recent developments in packaging and packaging laws - Plastic crates, Boil-in-bag package, plastic-shrink package, Cryovac film, microwave oven packaging, high barrier plastic bottles, Aseptic packaging, edible wraps, Packaging Laws and Regulations as per SWMA, Packaging Laws and Regulations as given under FSSAI, Tests for identification of packaging material

5. References

1. Sudhir Gupta (2007) Handbook of Packaging Technology, Engineers India Research Institute, New Delhi
2. Khanaka, S.S., Entrepreneurial Development, S. Chand and Company Ltd, New Delhi, 2006.
3. Suja, R. Nair(2004) Consumer Behaviour and Marketing Research, 1st Edition, Himalaya Publishers.
4. Hmacfie,(2007) Consumer led Food Product Development, Weedhead Publishing Ltd., UK
5. Fuller, Gordon, W(2005) New Food Product Development, 2nd Edition, CRC Press, Boca Raton, Florida.
6. Schaffner .D,J, Schroder , W.R.(2000)Food Marketing and International Perspectives, Web/McGraw Hill Publication

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6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
National	The course gives an understanding of the basics of food product development and the process of making a new food product from standardization to sensory evaluation to food packaging.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
ED	1	Survey of different types of new food products in the market
ED	2	Hands on learning on different sensory analysis techniques
ED	3	Collection of different food packaging material from surroundings

7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Presentation	Participative Learning
2.	Self testing of sensory techniques	Participative Learning
3.	Quiz	Participative Learning

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8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
CO3	CIA-2 Creating their own packaging material	
	CIA -2 Food Labeling	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE **3Q X 12 M = 36 M**				
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	Explain the stages of New Product Development in detail.	**CO 1**	**II**
2	**Module 1**	Explain the stages of Recipe standardization in detail.	**CO 1**	**II**
3	**Module 2**	Explain the types of sensory evaluation of foods.	**CO 2**	**II**
4	**Module 2**	Write the differences between Duo-trio and Triangle test?	**CO 2**	**IV**
5	**Module 3**	Define packaging and the need of packaging. Explain different types of packaging with examples.	**CO 3**	**I and II**
6	**Module 3**	Illustrate different types of plastics used in packaging? Explain examples of each.	**CO 3**	**II and V**
SECTION B - ANSWER ANY 4 OUT OF 6 **(To compulsorily have ONE question from each module)**			**4 Q X 6 M = 24 M**	
7	**Module 1**	List the benefits of standardized recipes	**CO 1**	**I**
8	**Module 1**	Illustrate the Components of standardized recipes	**CO 1**	**II**
9	**Module 2**	Describe the types of panel for sensory analysis	**CO 2**	**I**
10	**Module 2**	What are the requirements for sensory evaluation	**CO 2**	**I**
11	**Module 3**	List Components of nutrition label	**CO 3**	**IV**
12	**Module 3**	Explain Modified Atmosphere Packaging	**CO 3**	**V**

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SEMESTER – III
FOOD PRODUCT DEVELOPMENT
PRACTICAL

1.Course Description:
Programme: M.Sc.
Course Code: P24/NUT/DSC/302/P
Course Type: DSC-10
No. of credits: 2

Max. Hours: 30
Hours Per Week: 4
Max. Marks: 50

2. Course Objectives:

1. To understand the concept of development of a new product and prepare new products
2. To help students understand the various sensory evaluation techniques.

3. Course Outcome:

After the successful completion of the course, the student will be able to:

- To learn sensory evaluation techniques
- To develop a new product with label and packaging and evaluate its organoleptic acceptability.

PRACTICAL SESSIONS:

I. Sensory Evaluation Techniques – Subjective

1. Threshold test for salt.
2. Threshold test for sugars.
3. Triangle test.
4. Paired Comparison test.
5. Duo – trio test
6. Hedonic Rating test.

II. Food Product Development

7. Standardization of Basic Recipe and
8. Formulation of value added Variation I and II

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9. Calculation of Nutritive Value and Cost of the recipes.
10. Sensory Evaluation of Basic recipe and variations, Analysis of results ofsensory evaluation.
11. A report on financing banks and Institutions for Women Entrepreneurs
12. A report on successful women entrepreneurs in food industry.
13. A report on Patented Food Products in India.
14. Market survey on Food Products – collection of information on food products (different brands).
15. Market survey on Packaging Materials

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MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSC/302/P **Marks: 50**

No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. Complete the given sensory analysis using a score card.	10M
2. Prepare a new product using the given ingredients with labeling and packaging.	20M
3. Identify the packaging material.	10M
4. Viva	5 M
5. Record	5 M

Prepared by	Checked &Verified by	Approved by
Dr. Poonam Singhal Name and Signature of the teaching faculty	Ms. Tabitha Ramona Name and Signature of HoD	Dr. Uma Joseph Name and Signature of Principal

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DEPARTMENT OF NUTRITION

DSE- 3	**FOOD SAFETY**	
	SEMESTER- III	**45 HRS**

Module –1 Hygienic Handling of Food And Safe Handling

Module –2 Pollution, Pest Control, Food Security and Food Additives

Module –3 Adulteration and Food Laws

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

SEMESTER – III
FOOD SAFETY

1. Course Description

Programme: M.Sc.
Course Code: P24/NUT/DSE/303
Course Type: DSE-3
No. of credits: 3

Max. Hours: 45
Hours Per Week: 3
Max. Marks: 100

2. Course Objectives:

- To enable students to understand environmental sanitation and the link between environmental sanitation and health.
- To know the consequences of food poisoning and infection by pests and being aware of the levels of water treatment and types of pollution.
- To make students understand the foods that are adulterated and methods of detection of adulteration. Students will understand the consumer protection and Laws regarding food Adulteration.

3. Course Outcomes:

After the successful completion of the course, the student will be able to:

CO 1: Learn and understand the basic aspects of food sanitation, training and safe layout of a food premise. Understand the importance of Personal hygiene.
CO 2: Analyze consequences of food poisoning and infection caused by household pests. Understand the hazards of environmental pollution on health and community. Remember the principles of different levels of water treatment.
CO 3: Understand the adulteration of common foods and their adverse impact on health, comprehend certain skills of detecting adulteration of common foods. Know the basic laws and procedures regarding food adulteration and consumer protection.

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4. **Course Content**

MODULE1: HYGIENIC HANDLING OF FOOD AND SAFE HANDLING **(15 Hrs)**

1.1 Food Hygiene: Definition of hygiene, food hygiene and sanitation, Basic aspects of personal hygiene, Procedures to minimize microbial load, Common faults in food preparation, Sanitation training and education, Steps in planningand implementing a training program.

Layout and premises: Ventilation and lighting of premises, General guidelines of cleaning equipment, General guidelines for cleaning preparation area.

1.2 Personal hygiene: Necessity of personal hygiene, Health and hygiene of food handler, Personal appearance and sanitary practices, the Flow of Food: An Introduction, Preventing Cross-Contamination, Time and Temperature Control, Safe Food handler, How Food handlers can contaminate food.

1.3 Cold handling and Re-heating: Safe methods of chilling and freezing processed food. Methods of checking and recording temperatures in temperature-controlled food production and storage areas. The importance of high temperatures in the supply of safe food. Risks associated with under-cooking foods. Methods of monitoring and recording heat processes.

MODULE2: POLLUTION, PEST CONTROL, FOOD SECURITY AND FOOD ADDITIVES **(15 Hrs)**

2.1 Pollution: Uses and sources of water, Contamination of water, Hazards of water pollution, large scale purification of water, small scale purification of water, Chlorination and methods of chlorination. Prevention of air pollution, noise pollution, solid waste pollution, methods of waste disposal, water pollution.

2.2 Pest control: Classification of pest, Control of household pest with special reference to-Mosquito, Housefly, Rats and rodents, Cockroaches, Importance of pest control, Use of pesticides and insecticides.

2.3 Food security: Introduction to food & nutrition security- Definition, factors affecting food & nutrition security, national and house-hold food security, issues & challenges of food security.

Food additives- Definition, classification, role of additives in processed foods. Safe levels of additive uses and the institutions involved in the process. Current scenario- emergence of street foods and convenience foods and the related safety concerns

MODULE 3: ADULTERATION AND FOOD LAWS **(15 Hrs)**

3.1 Common Foods and Adulteration: Common Foods subjected to Adulteration, Definition of Adulteration, Types; Poisonous substances, foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives – Intentional and incidental. General Impact on Human Health.

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3.2 Adulteration of Common Foods and Methods of Detection: Means of Adulteration, Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices and condiments, Processed food, Fruits and vegetables. Additives and Sweetening agents.

3.3 Present Laws and Procedures on Adulteration: Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of India–Rules and Procedures of Local Authorities. Agmark, I.S.I. Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives.

5. Reference Books:

1. Social and preventive medicine -Park and Park
2. Food hygiene and sanitation -S Roday, Tata Mc graw Hill publishing Co Ltd.,3rd print
3. Public health Nutrition --- Michael J. Gibney,Barrie M . Margetts, John M. Kearney and Lenore arab(Eds.) --- Nutrition society textbook series , Blackwell publishing.
4. Mahindra N. S, 2008, Food Additives, Characteristics, Detection and Estimation, APH Publishing Corporation, New Delhi
5. Ward law G.M, Hamp J S, 2007, Perspectives in Nutrition, 7th edition, Mc Graw Hill
6. The Food Safety and Standards Act along with Rules and Regulations, 2011, Delhi, Commercial Law Publishers (India) Pvt Ltd.
7. Khanna K et al, 2013, Text Book of Nutrition and Dietetics, Phoenix publications
8. Sethi P and Lakra P, Aahaarvigyaan, Poshanevamsuraksha, 2015, Elite Publishing House.

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6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Global	To produce, provide, distribute and store food that is safe for Human consumption. It also includes the components like Hygiene, protection against pests and rodents, adulteration etc. for safe consumption. It explains different aspects of food safety and hygiene and how these practices can be implemented while Production, preparation and consumption of foods.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	3	The experiments on Adulteration of various food samples will enable the students to develop a skill of identifying the foods adulterated and distinguish between the two.

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7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Adulteration of Foods	Experiential Learning
3.	Group Discussion	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
CO3	CIA-2 seminar presentation	
	CIA-2 Skill test (written)	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE **3Q X 12 M = 36 M**				
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	What is food hygiene? Write a note on the basic aspects of food hygiene.	**CO 1**	**I**
2	**Module 1**	Describe the general guidelines of cleaning the equipment and preparation area.	**CO 1**	**I**
3	**Module 2**	List down the different types of pests. Illustrate how can pests be controlled.	**CO 2**	**I and II**
4	**Module 2**	Discuss in detail on the hazards of water pollution and its prevention in food service.	**CO 2**	**I**
5	**Module 3**	Describe the Adulteration of Common Foods and examine the Methods of Detection.	**CO 3**	**I and IV**
6	**Module 3**	Elaborate the Highlights of Food Safety and Standards Act 2006 (FSSA).	**CO 3**	**VI**
SECTION B - ANSWER ANY 4 OUT OF 6 **(To compulsorily have ONE question from each module)**			**4 Q X 6 M = 24 M**	
7	**Module 1**	Illustrate the Sanitation training and education	**CO 1**	**II**
8	**Module 1**	Describe the Importance of ventilation and lighting of premises	**CO 1**	**I**
9	**Module 2**	Classification of pest	**CO 2**	**II**
10	**Module 2**	Explain Methods of chlorination	**CO 2**	**V**
11	**Module 3**	Examine the food additives	**CO 3**	**IV**
12	**Module 3**	Explain Role of ISI	**CO 3**	**V**

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SEMESTER III
FOOD SAFETY
PRACTICAL

Programme : M.Sc.
Course Code: P24/NUT/DSE/303/P
Type of course: DSE-3
No. of credits : 2

Max.Hours : 30
Hours per week: 4
Max.Marks: 50

Course Objectives:

To enable students to:

1. Understand the principle of food hygiene and sanitation.

Course outcomes:

- To identify and imply common personal hygiene methods.
- To analyze water and waste disposal treatment.

1. Personal Hygiene:
2. Preparation of inventory list to check personal hygiene of food handlers
3. Hand hygiene and wash hand technique
4. Care of skin, hair, hand, feet, nails and mouth.
5. Hygiene and Sanitation:
6. Estimation of hardness of water using EDTA method
7. Microbial Contamination of Water
8. Common quick tests for detection of food adulterants at household level
9. Sago with sand and talcum powder
10. Milk for water and starch; Ghee, butter and Khoa for starch, Tea and coffee
11. Detection of chalk powder in sugar, salt and jaggery; Honey for sugar solution
12. Adulterants in Chilli powder - brick powder, water soluble synthetic colour, salt
13. Powder or Talcum Powder; Sugar with urea.
14. Pepper, sugar and salt
15. Methods of disposal of waste
16. Food Additives Experiment.

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FOOD SAFETY

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSE/303/P **Marks : 50**

No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. Write the Procedure for the detection of adulterants in the following 25M
   a)
   b)
   c)
2. Estimate the hardness of water using EDTA method 10M
3. Identify the given spotters 10M
   a)
   b)
4. Record 5M

Prepared by	Checked &Verified by	Approved by
Ms. Durga Nandini Name and Signature of the teaching faculty	Ms. Tabitha Ramona Name and Signature of HoD	Dr. Uma Joseph Name and Signature of Principal

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DEPARTMENT OF NUTRITION

DSE- 2	PEDIATRIC NUTRITION	
	SEMESTER- III	45 HRS

Module –1 Assessment and Management of Critically Ill Children

Module –2 Dietary Management in Gastrointestinal Tract, Liver and Kidney Diseases

Module –3 Dietary Management in Diabetes And Nutrition Needs for Special Children

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

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SEMESTER – III
PEDIATRIC NUTRITION

1. Course Description:

Programme: M.Sc.
Course Code: P24/NUT/DSE/302
Course Type: DSE-2
No. of credits: 3

Max. Hours: 45
Hours Per Week: 3
Max. Marks : 100

2. Course Objectives:

- To understand the growth, development and nutritional requirements of children.
- To get an insight knowledge on inborn errors of metabolism and pediatric critical care.

3. Course Outcomes:

After the successful completion of the course, the student will be able to:

CO 1: Remember the methods of assessment and management of critically illchildren.

CO 2: Understand the dietary principle of disease of gastrointestinal tract, liver and kidney diseases.

CO 3: Learn the dietary management in diabetes and nutritional needs for special children

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4. Course Content

MODULE 1: ASSESSMENT AND MANAGEMENT OF CRITICALLY ILL CHILDREN

(15 Hrs)

1.1. Introduction: Normal growth in children – formulae for average weight, height and head circumference in children (Birth to 12 years), factors affecting normal growth in children, milestones.

1.2. Assessment: Physical examination - Blood pressure, respiratory rate, body temperature, head to toe examination. Anthropometry – Weight, Height, MUAC, Head circumference. Interaction of nutrition and infection in children. Determination of nutritional requirements in hospitalized children – calories, proteins, fats, carbohydrates, vitamins, minerals, water & electrolytes and immunonutrients.

1.3. Nutritional support in critically ill children: Metabolic changes during critical illness. TPN, EN and dietary management. SAM, PEM - Identification criteria, causes. Management of PEM – Resuscitation, Restoration and Rehabilitation, Dietary management of PEM.

MODULE2: DIETARY MANAGEMENT IN GASTROINTESTINAL TRACT, LIVER AND KIDNEY DISEASES **(15 Hrs)**

2.1. Nutritional support in diarrheal disease: Adverse effect of diarrhea , Acute diarrhea – Nutritional management, Oral Rehydration Therapy (ORT), Fluid & Electrolyte Therapy. Persistent diarrhea – pathogenesis and dietary management. Constipation - dietary management. Irritable Bowel Syndrome (IBD) – (Crohn's disease, Ulcerative colitis), dietary management.

2.2. Liver : Hepatitis, Indian Childhood Cirrhosis - dietary management.

2.3. Renal diseases : Dietary management in Nephrotic syndrome , Acute Renal Failure , Chronic Renal Failure .

MODULE 3: DIETARY MANAGEMENT IN DIABETES AND NUTRITION NEEDS FOR SPECIAL CHILDREN **(15 Hrs)**

3.1. Juvenile Diabetes: Metabolic changes in Juvenile Diabetes, criteria for diagnosis. Management – Medical Nutrition Therapy, nutrient requirement, insulin regime and diet plan , Exercise and hypoglycemia. Considerations in different stages of childhood – infants, toddlers, school children, adolescents. Complications of Diabetes – hypoglycemia, diabetic ketoacidosis, somogy& dawn effect.

3.2. Inborn errors: Diagnosis and dietary management , CHO – glycogen storage disease, galactosemia, fructosemia. Proteins – PKU , MSUD, Alkaptonuria , Homocystinuria, Tyrosinemia. Minerals – Wilson's disease.

3.3 Nutrition for children with special needs: Ketogenic diet – Epilepsy, Neutropenic diet – marrow transplant. Autism.

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5. Reference Books:

1. Madhu Sharma, Pediatric Nutrition in Health and Disease, 1st edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2013
2. K. E. Elizabeth, Fundamentals of Pediatrics, 2nd Edition, Paras Publishers, Hyderabad, 2002
3. Meenakshi N. Mehta, Nitin J. Mehta, Nutrition and Diet for Children Simplified, 1st edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014
4. Suraj Gupta (Ed), Recent advances in Pediatrics – Nutrition, Growth and Development, Special Volume 20, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2010.
5. AnjanaAgarwal, ShobhaUdipi, Text book of Human Nutrition, 1st edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2014
6. Clinical Dietetics Manual- Indian Dietetic Association, 2011.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
National	The course gives an understanding of the growth, development and nutritional requirements of children and also gives a knowledge on inborn errors of metabolism and pediatric critical care.

b) Components on Skill Development/Entrepreneurship/Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
EMP	1	Growth charts
EMP	2	Presentations
EMP	3	Mind maps to study the inborn errors of metabolism

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7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Group Discussion	Participative Learning
3.	Quiz/ case studies	Experiential Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments andEnd Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-2 Seminar/ assignment	
	Mind maps	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE			**3Q X 12 M = 36 M**	
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	What are the factors affecting normal growth in children and how do you measure it.	**CO 1**	**I**
2	**Module 1**	Illustrate the identification criteria, etiology and management of PEM.	**CO 1**	**II**
3	**Module 2**	Explain in detail what are the different nutritional supports provided in diarrheal disease.	**CO 2**	**II**
4	**Module 2**	Explain in detail Juvenile Diabetes	**CO 2**	**II**
5	**Module 3**	Examine the different types of inborn errors	**CO 3**	**IV**
6	**Module 3**	List the dietary guidelines in epilepsy.	**CO 3**	**I**
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have ONE question from each module)			**4 Q X 6 M = 24 M**	
7	**Module 1**	Explain Anthropometry	**CO 1**	**II**
8	**Module 1**	Define TPN	**CO 1**	**I**
9	**Module 2**	What is Irritable Bowel Syndrome	**CO 2**	**I**
10	**Module 2**	Explain Diabetic ketoacidosis	**CO 2**	**V**
11	**Module 3**	Compare Alkaptonuria and , Homocystinuria	**CO 3**	**IV**
12	**Module 3**	Illustrate Ketogenic diet	**CO 3**	**II**

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SEMESTER -III
PEDIATRIC NUTRITION

PRACTICAL

Programme: M.Sc.
Course Code: P24/NUT/DSE/302/P
Type of course: DSE-2
No. of credits: 2

Max.Hours: 30
Hours per week: 4
Max.Marks: 50

Course Objectives:

1. Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of the community.

Course outcomes:

- To create and prepare nutritionally adequate diets
- To apply the principle of supplementary feeding to prepare infant friendly foods.

1. To plan some finger foods (single foods) for children aged 1-3 year.
2. Plan foods with the following food combinations for the given age (cereal + pulse, cereal + meat/animal proteins, cereal+ pulse + green leafy vegetables)
3. Plan and prepare meals using methods which enhance nutritive values (such as sprouting, fermentation, cooking methods etc)
4. Different food supplements for infants that can be introduced after six months.
5. Plan a sample menu for a one- year-old child (Energy -1100 kcal) Carbohydrate 40%, Protein 19%, Fat 41%
6. Plan a few breakfast foods for children aged 1-3 years.

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PAEDIATRIC NUTRITION

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSE/302/P **Marks: 50**

No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. Prepare and display the given recipe	30 M
a) Ingredients and method of preparation	10 M
b) Calculation of nutrients (Energy, protein , Fat)	5M
c) Display and Taste	15 M
2. Plan a sample menu for a one- year-old child (Energy -1100 kcal)	15M
3. Record	5 M

Prepared by	Checked & Verified by	Approved by
Dr. Poonam Singhal Name and Signature of the teaching faculty	Ms. Tabitha Ramona Name andSignatureof HoD	Dr. Uma Joseph NameandSignatureof Principal

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DEPARTMENT OF NUTRITION

DSE- 4	**PUBLIC HEALTH NUTRITION** **SEMESTER- III**	**45 HRS**

Module –1 Introduction To Public Health Nutrition

Module –2 Epidemology, Addictions and Aids

Module –3 Nutrition For Special Conditions

- The syllabus contains three Modules.
- Paper should give equal weightage to all Modules.
- Three long question- One question per module with internal choice

SEMESTER – III
PUBLIC HEALTH NUTRITION

1. Course Description

Programme: M.Sc.
Course Code: P24/NUT/DSE/304
Course Type: DSE-4
No. of credits: 3

Max. Hours : 45
Hours Per Week: 3
Max. Marks : 100

2. Course Objectives:

- To enable students to identify and contribute to the prevention of public health/social health problems in the country.
- To equip students with workable knowledge to treat common illnesses at home.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO 1: Learn Public health policies and Health programmes.

CO 2: Learn the Epidemology and understand the control programmes of Addictions and Aids.

CO 3: Evaluate and understand the role of Nutrition for special conditions, disaster management.

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4. Course Content

MODULE1: INTRODUCTION TO PUBLIC HEALTH NUTRITION **(15 Hrs)**

1.1 Introduction: Principles and practices of public health: Public Health- causation, prevention, social determinants of health, health systems and health policy. Health equity, Environments and health, Public Health action.

1.2 Policies of Health: Health system and policy in developing countries: Basic theoretical approaches and concepts used in policy analysis. Understanding of global and national health policies, including current trends. Analyse the political system within which policies are made. Contextual factors that influence to policy change. Changing global health policy environment Health management: Management principles and practices: Basic knowledge of health care systems and the environment in which health care managers and providers function

1.3 Health Programmes: Planning, implementation, Monitoring and Evaluation. Components of strategic management. Behavioural aspects of governmental, faith based and other non – governmental organizations Quality: define quality, its importance in public health, measures to manage and improve equality

MODULE2: EPIDEMOLOGY, ADDICTIONS AND AIDS **(15 Hrs)**

2.1. Epidemology: Basic Epidemiology including communicable and non-communicable diseases: History of Epidemiology. Measurements in Epidemiology. Incidence and prevalence. Causation and association. Measures of association. Introduction to confounding and bias. Screening tests- validity and reliability methods. Disease surveillance. Outbreak investigation, Communicable and non-communicable diseases.

2.2. Addictions: Smoking, Alcoholism, Drug addiction

2.3. AIDS: AIDS including AIDS Control Programme.

MODULE 3: NUTRITION FOR SPECIAL NEEDS **(15 Hrs)**

3.1 Nutrient deficiency: Causes, symptoms, treatment, prevention of the following:Protein Energy Malnutrition(PEM), Vitamin A Deficiency (VAD).

3.2 Mineral deficiency: Causes, symptoms, treatment, prevention of the following: Iron Deficiency Anaemia (IDA) Iodine Deficiency Disorders (IDD) Zinc Deficiency, Fluorosis.

3.3. Nutrition management in disasters: Feeding problems in children with Special needs. Considerations during natural and man – made disasters. Basic guidelines in Disaster management.

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5. Reference Books:

1. Mudambi ,S.R and Rajagopal, M.V. Fundamentals of Foods, Nutrition and Diet Therapy; 2012; New Age International Publishers
2. Wardlaw G . M, Hampl , J S. Perspectives in Nutrition; Seventh Ed; 2007; McGraw Hill..
3. Gibney et al Public Health Nutrition; 2004; Blackwell Publishing.
4. Srilakshmi, B. Dietetics; 2012; New Age International (P) Ltd.
5. Bamji , M . S, Rao, N .P and Reddy , V. Text Book of Human Nutrition; 2009;Oxford & IBH Publishing Co. Pvt . Ltd.
6. Lakra, P, Singh , M . D. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Global	Aids to understand the various Health policies available and the deficiency disorders occurring in the population globally. This enables the intervention program by the government.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
EMP	1, 2 and 3	Survey of government Nutrition programmes

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6. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Seminar Presentation	Participative Learning
2.	Presentation	Experiential Learning
3.	Group Discussion	Participative Learning

7. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1	End Semester examination
CO2	CIA-1	
C03	CIA-2 ASSIGNMENT	
	CIA-2 Skill test (written/quiz)	

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b) Model Question Paper- End Semester Exam

SECTION A - INTERNAL CHOICE **3Q X 12 M = 36 M**				
Question Number	**Question**	**Question**	**CO**	**BTL(Blooms Taxonomy Level)**
1	**Module 1**	List the social determinants of health and health systems	**CO 1**	**I**
2	**Module 1**	Describe health policies and system in developing countries.	**CO 1**	**I**
3	**Module 2**	Illustrate the measurement of epidemology, incidence and prevalence	**CO 2**	**II**
4	**Module 2**	Explain in detail the AIDS control programme.	**CO 2**	**I**
5	**Module 3**	What are the basic food guidelines to be followed in the case of disaster.	**CO 3**	**I**
6	**Module 3**	Explain the etiology, symptoms, treatment, prevention of IDD	**CO 3**	**V**
SECTION B - ANSWER ANY 4 OUT OF 6 **(To compulsorily have ONE question from each module)**			**4 Q X 6 M = 24 M**	
7	**Module 1**	Health equity	**CO 1**	**I**
8	**Module 1**	Explain Quality	**CO 1**	**II**
9	**Module 2**	Describe Alcoholism	**CO 2**	**I**
10	**Module 2**	What is AIDS	**CO 2**	**I**
11	**Module 3**	Discuss Sports nutrition	**CO 3**	**I**
12	**Module 3**	Elaborate VAD	**CO 3**	**VI**

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SEMESTER III

PUBLIC HEALTH NUTRITION

PRACTICAL

Programme : M.Sc.
Course Code: P24/NUT/DSE/304/P
Type of course: DSE-4
No. of credits : 2

Max.Hours : 30
Hours per week: 4
Max.Marks: 50

Course Objectives:

1. To develop recipes for treating various nutritional deficiencies.
2. To develop in them the skill to modify normal diets for disease conditions.

Course outcomes:

- To develop recipes for various nutritional deficiencies
- To develop in them the skill to modify normal diets, for disease conditions.

PRACTICAL SESSIONS:

1. Planning of snacks for PEM
2. Preparation of snacks for PEM
3. Planning of diet for VAD
4. Preparation of diet for VAD
5. Planning of diet for IDA
6. Preparation of diet for IDA
7. Visit to any national programme.
8. Visit to ICDS center and Report

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PUBLIC HEALTH NUTRITION

MODEL QUESTION PAPER

PRACTICAL

Course Code: P24/NUT/DSE/304/P **Marks : 50**

No. of credits: 2 **Time: 3 Hrs**

Answer the following

1. Plan and prepare a snack for a PEM child 30 M
2. Calculate the nutritive value for the given recipe 15 M
3. Record 05 M

Prepared by	Checked &Verified by	Approved by
Nandini Ms. Durga Nandini Name and Signature of the teaching faculty	Ms. Tabitha Ramona Name andSignatureof HoD	Dr. Uma Joseph NameandSignatureof Principal

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HYDERABAD-500016

(AN AUTONOMOUS COLLEGE OF OSMANIA UNIVERSITY)

DEPARTMENT OF NUTRITION

GE	**SPORTS NUTRITION** **SEMESTER- III**	**30 HRS**

Module –1 **Physical Fitness and Exercise Physiology**

Module –2 **Nutritional Requirements in Sports**

- The syllabus contains two Modules.
- Paper should give equal weightage to all Modules.
- Eight short question- Four questions per module with external choice

SEMESTER –III
SPORTS NUTRITION

1. Course Description:

Programme : M.Sc. **Max.Hours : 30**
Course Code: P24/NUT/GE/301 **Hours per week: 2**
Type of course: GE **Max.Marks: 50**
No. of credits : 2

2. Course Objectives:

- Understand special nutritional requirements for physical fitness and sports.
- Apply the knowledge of nutrition to improve the performance of a sports person.

3. Course Outcomes:

After the successful completion of the course, the student will be able to:

CO 1: Understand the basics of physical activity and sports physiology related to various sports.

CO 2: Remember the requirements of different nutritional components required for athletic performance.

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4. Course Content

MODULE– 1: PHYSICAL FITNESS AND EXERCISE PHYSIOLOGY (15 Hrs)

1.1 Physical Fitness: Definition and Components- Health related and Skill related , Assessment of Physical Fitness: Anthropometry, Body composition, Cardio -respiratory endurance, muscular fitness, musculoskeletal flexibility, Benefits of physical fitness on wellness dimensions, Alternative system for health and fitness: Ayurveda, Yoga , Meditation, Vegetarianism

1.2 Exercise-Types of exercises and its impact on fitness, Effect of exercise on Musculo-skeletal system- muscle fatigue, prevention and recovery, Effect of exercise on Cardiovascular system-cardiac cycle, cardiac output, Blood pressure, athlete heart, Effect of exercise on Respiratory system- lung performance, lung function tests

1.3 Energy Production in sports-ATP – utilization and Resynthesis, Anaerobic Energy System (Lactic Acid System), Aerobic Energy system

MODULE2: NUTRITIONAL REQUIREMENTS IN SPORTS (15 Hrs)

1.1 Nutritional requirements and RDA for sports-Nutritional requirements for exercise and sports: Sources of fuels – carbohydrates, Carbohydrate loading, Proteins - role in resistance exercise, Fats requirement, Role of fat in inflammation and sports injury

1.2 Requirement of water and fat soluble vitamins and minerals- B vitamins, Vitamin C, Vitamin A, D, E, Iron, Calcium and Zinc

1.3 Fluid requirements and Dietary supplements

Fluid balance in sports- Importance, symptoms and prevention of dehydration, Sports drink-Hypo, Iso and Hypertonic drink for hydration, Dietary supplements and ergogenic aids (nutritional. Pharmacological and physiological),

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5. Reference Books:

1. BamjiS.M.,Rao NP and Reddy V.1998.Text book of Human Nutrition.Oxford and IBH publishing CO. New delhi.
2. Fink H.H.,Mikesky E.A and Burgoon A.L.2012.Practical Applications in Sports Nutrition.3rd ed.Jones and Bartlett Learning.USA.
3. Burke Louse and DeakinVicky(2006) Clinical sports Nutrition.
4. Ira Wolinsky(Ed)(1998): Nutrition in Exercise and Spots,3rd Edition,CRC Press.
5. Mahan, L.K &Ecott- Stump, S.(2000): Krause's Food, Nutrition and Diet Therapy
6. Shils, M.E., Olson,J.A., Shike,N. and Ross, A.C(Ed)(1999): Modern Nutrition in Health & Disease,9th Edition, Williams& Wilkins.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
Global	The course gives an understanding of the basics of physical activity and sports physiology. It also gives knowledge of the different macro and micronutrients and water requirements different sports personnel.

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	1	Presentations
EMD	2	Plan and counseling diet plan for sports individuals

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7. Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Group Discussion	Participative Learning
2.	Presentation	Participative Learning

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments andEnd Semester Examination

COs	Continuous Internal Assessments - CIA (40%)	End Semester Examination - (60%)
CO1	CIA-1PPT	End Semester examination
CO2	CIA1-Survey of ergogenic supplements	

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b) Question Paper Pattern

SPORTS NUTRITION
MODEL QUESTION PAPER
THEORY

Course Code: P24/NUT/GE/301 **Max Marks: 30**
Credits: 2 **Time: 1Hrs**

SECTION – A

Answer any SIX of the following **6 x 5 = 30 M**

1. Types of exercise
2. Physical activity components
3. Fluid requirement in athletes
4. Ergogenic supplements
5. Lung function tests
6. Carbohydrate loading
7. Role of fat
8. Yoga

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