

**UNIVERSITY OF MUMBAI**

No.UG/ICC/2013-14/99  
MUMBAI- 400 032  
29<sup>th</sup> January, 2014

The Principal,  
College of Home Science,  
Nirmala Niketan,  
49, New Marine Line,  
**MUMBAI- 400 020.**

Madam,

I am to invite your attention to the Ordinance, Regulation and Syllabi relating to the Diploma in Dietetics and Applied Nutrition **vide** this office Circular No.UG/ 303 of 1995, dated 19<sup>th</sup> July, 1995 and to inform you that the recommendation made by the Faculty of Science at its meeting held on 13<sup>th</sup> March, 2013 has been accepted by the Academic Council at its meeting held on 29<sup>th</sup> April, 2013 **vide** item No.4.94 and subsequently approved by the Management Council at its meeting held on 20<sup>th</sup> June, 2013, 21<sup>st</sup> June, 2013 & 11<sup>th</sup> July, 2013 **vide** item No.14 and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 54 (1) and 55 (1) of the Maharashtra Universities Act, 1994, the Ordinance 3545 and Regulation 8705 and syllabus as per the Credit Based Semester & Grading System for Post-Graduate Diploma programme in course of Dietetics and Applied Nutrition (Semester I & Semester II) is amended, which is available on the University's web site ([www.mu.ac.in](http://www.mu.ac.in)) and that the same has been brought into force with effect from the academic year 2013-14.

Yours faithfully,

Sd/-

Deputy Registrar  
Under Graduate Studies

**A.C/4.94/29/04/2013**

**M.C/14/20/06/2013,21/06/2013 &11/07/2013**

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No. UG/99-A of 2013-14      MUMBAI-400 032      29<sup>th</sup> January, 2014

Copy forwarded with compliments for information to :-

- 1) The Dean, Faculty of Science.
- 2) The Chairperson, **Ad-hoc** Board of Studies in Home Science.
- 3) The Director, Board of Colleges and University Development,
- 4) The Co-Ordinator, University Computerization Centre,
- 5) The Controller of Examinations.

Sd/-

Deputy Registrar  
Under Graduate Studies

AC 29/4/2013

Item no. 4.94

**UNIVERSITY OF MUMBAI**



**Ordinances and Regulations**

**SEMESTER I & SEMESTER II**

**Program: Post-Graduate Diploma**

**Course: Dietetics and Applied Nutrition**

(Credit based Semester and Grading System  
with effect from the academic year 2013–2014)

### Preamble

The Post Graduate Diploma in Dietetics and Applied Nutrition is designed to impart advanced knowledge and skills that is life oriented, career and community oriented. It has special relevance to industry and hospital application with the help of weekly field work, rural camp of seven days and hospital internship programme.

#### Objectives of the course:

- To develop the capabilities and knowledge of students in the areas of  
Physiology  
Basic, Clinical and Applied Nutrition  
Clinical Testing and Food Analysis  
Foods and Dietetics  
Diet Therapy  
Food Service Management  
Public Health
- To acquire relevant skills required to develop students to become efficient professionals in academics, healthcare institutions and community service.

#### Eligibility:

**O.3545** A candidate for being eligible for admission to the Post Graduate Diploma in Dietetics & Applied Nutrition must have taken either:

- a) Bachelor of Science (Home Science) with specialization in Food, Nutrition & Dietetics**
- b) Bachelor of Science (Home Science) (General)**
- c) Bachelor of Science in Microbiology/Bio-chemistry  
Life Sciences**
- d) Bachelor of Science with a combination of the above subjects with Chemistry**
- e) Bachelor of Nursing of this University or a Degree of another University recognized as equivalent thereto.** The duration of the Diploma Course shall be one year and there shall be a University Examination at the end of the course. The Diploma in Dietetics and Applied Nutrition shall not be conferred upon a candidate unless he has passed in all subjects, practicals and in field work including internship.

#### **TO BE AMENDED TO**

**O.3545** A candidate for being eligible for admission to the Post Graduate Diploma in Dietetics & Applied Nutrition must have taken either:

- a) Bachelor of Science (Home Science) with specialization in Food, Nutrition & Dietetics
- b) Bachelor of Science (Home Science) (General)
- c) Bachelor of Science in Microbiology/Bio-chemistry  
Life Sciences
- d) Bachelor of Science with a combination of the above subjects with Chemistry
- e) Bachelor of Nursing of this University or an equivalent Nursing Degree of another recognised University.

The duration of the Diploma Course shall be one year and there shall be a University Examination at the end of the course. The Diploma in Dietetics and Applied Nutrition shall not be conferred upon a candidate unless he has passed in all subjects, practicals and in field work including internship.

**R.8705 P.G. DIPLOMA IN DIETETICS & APPLIED NUTRITION FEE STRUCTURE**

	*Particulars of fees	Amount
1	Tuition	9000.00
2	Laboratory	2000.00
3	Library	175.00
4	Gymkhana	175.00
5	Other fees	125.00
6	Extra-curricular Activities	25.00
7	University Share	1000.00
8	Diaster relief fees	10.00
9	E. Charge	20.00
10	Identity Card/Library Card	25.00
11	Exam fees	735.00
12	University Reg. Fees	825.00
13	Magazine	50.00
14	Laboratory Deposit	600.00
15	Library Deposit	300.00
16	Utility Fees	100.00
17	Development Fund	300.00
18	Students Welfare Fund	25.00
19	Ashwamedha/Indradhanushya	30.00
20	E Service Charge	50.00
21	V.C. Fund	20.00
22	Convocation fee	250.00
23	N.E.F. (Value Added)	3500.00
24	National Services Scheme	10.00
	<b>TOTAL</b>	<b>19350.00</b>

\*Fees structure subject to further Fee Revision.

**POST-GRADUATE DIPLOMA IN DIETETICS AND APPLIED NUTRITION**

**Semester I**

<b>Course Code</b>	<b>Subject</b>	<b>Periods/week</b>	<b>Semester End Exam Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>
PSDDAN101	Physiology	2	60	40	100	3
PSDDAN102	Basic Nutrition	3	60	40	100	3
PSDDAN103	Applied Nutrition and Public Health	2	60	40	100	3
PSDDAN104	Foods and Dietetics	3	60	40	100	3
PSDDAN105	Food Service Management	3	60	40	100	3
PSDDAN106	Clinical Nutrition	3	60	40	100	3
PSDDANP101	Diet Therapy	8	100	--	100	2
PSDDANP102	Clinical Testing	3	50	--	50	2
PSDDANP103	Applied Nutrition Field Work	2 once a week	50	---	50	2
<b>Total</b>		29 periods			<b>800</b>	<b>24</b>

Course Code	Title	Periods/week	Marks	Credits
PSDDAN101	PHYSIOLOGY	2	100	3

#### Objectives

- To enable the students to understand the functions of the body in health and its adaptation to changed conditions.
- To enable the students to understand the implications of dietary modifications on the functioning of the various systems.

S. No.	Course Content	Periods
<b>Unit I</b>	Brief introduction to the structure of the cell and tissues Digestive System: Nature and functions of the gastro-intestinal tract, namely the elementary canal, mouth, stomach, small intestine, large intestine, colon, liver, pancreas and gall bladder. Cardio-vascular system: Anatomy and Physiology of the heart and blood vessels, blood circulation, composition of blood, regulations of blood pressure, ECG	<b>15</b>
<b>Unit II</b>	Excretory System: Renal: Mechanism of urine formation, fluid and electrolyte balance. Endocrine system: Brief review of the hormones secreted by endocrine glands and their effects on metabolism and associated disorders	<b>15</b>

#### References

Guyton, A.C. (1986) Textbook of Medical Physiology, Saunders Company.  
Best and Taylor, (1975) The living Body. Chapman and Hall Ltd., London.  
Chatterjee C. C. (1988). Human Physiology, 10<sup>th</sup> Edition, Medical Allied Agency.  
Tortora G.J. and Anagnostakos N.P. (1990). Principles of Anatomy and Physiology, 6<sup>th</sup> Edition. Harper and Row

Course Code	Title	Periods/week	Marks	Credits
PSDDAN102	BASIC NURITION	3	100	3

#### Objectives

- To create a better understanding of the basic aspects of human nutrition by providing information on the current concepts of nutritional principles
- To give a simple account of the metabolism and functions of the major dietary constituents and their nutritional and clinical importance.
- To study the interrelationships between nutrients along with their recommended allowances and food sources so as to enable students to become aware of the importance of a balanced diet based on sound nutritional principles.

S. No.	Course Content	Periods
<b>Unit I</b>	Introduction: Concept of Nutrition, Relation of nutrition to health, Adequate nutrition, optimum nutrition and malnutrition, The emergence, scope and methodology of Nutrition as a Science Energy Metabolism: Physiology fuel value, Direct and Indirect Calorimetry, Basal and Resting metabolism, Total energy requirement and it's modification under normal physiological and other stress conditions.	<b>15</b>
<b>Unit II</b>	<b>Carbohydrates</b> Classification and functions Digestion, Absorption, transport, storage and utilization Clinical and nutritional significance of carbohydrates Classification of dietary fibre and its clinical significance <b>Lipids:</b> Classification and functions, Digestion, absorption, transport, utilization and storage, Role of essential fatty acids, PUFAs, MUFAs, Clinical and Nutritional significance, Synthesis and clinical significance of prostaglandins, Cholesterol synthesis regulation of cholesterol metabolism	<b>15</b>
<b>Unit III</b>	<b>Proteins</b> Classifications of amino acids and proteins, Review of digestion, absorption, transport and utilization, Evaluation of protein quality by assessment of digestibility coefficient, biological value, protein efficiency ratio, NDP cal. Percent and Net Protein utilization. Supplementary value of proteins. Sources, recommended allowances and deficiency diseases Amino acid toxicity and imbalance	<b>15</b>

**References**

- Anderson L., Dibble M., Turkki P., Mitchell H. and Rynbergen H. 1982, Nutrition in Health and Disease. 17<sup>th</sup> Edition J.B. Lippincott Company. Philadelphia, Toronto.
- Davidson S., Passmore R. and Brock J.F., (1986), Human Nutrition and Dietetics, Churchill Livingstone, Edinburgh.
- Devlin T.M., (1986), Textbook of Biochemistry with clinical correlations (2<sup>nd</sup> Edition), John Wiley.
- Goodhart R.S. and Shils M.e. (Ed), (1994). Modern Nutrition in Health and Disease, Lea and Febiger, Phila.
- Gopalan C., Rama Sastri B.V. and Balasubramanian S.C., 1989. Nutritive Value of Indian Foods. 2<sup>nd</sup> Edition ICMR Offset Press, New Delhi.
- Krause M.V. and Mahan K. 1984 – Foods, Nutrition and Diet Therapy. 7<sup>th</sup> Edition, W.B. Saunders Company U.S.A.
- Lehinger A.L., (1984), Principles of Biochemistry. Worth Publishers New York.
- Machlin L.J. (1984) Ed., Handbook of Vitamins – Nutritional, Biochemistry and Clinical Aspects, M. Dekker, New York.
- Pike R.L. and Brown M.L. (1984), Nutrition – An Integrated Approach, John Wiley, New York.
- Rajalakshmi, (1987), Applied Nutrition, Oxford/IBH

Course Code	Title	Periods/week	Marks	Credits
PSDDAN103	APPLIED NUTRITION AND PUBLIC HEALTH	2	100	3

**Objectives**

- To enable the students to understand Nutrition and Health situations in India.
- Their role as a dietitian in improving the nutritional and Health Status of the vulnerable groups and the overall community.
- Acquire skills in assessing Nutritional status of the people, skills in communications and planning, organizing abilities required for conducting nutrition education programmes.
- Develop the right attitudes towards working in the communities.

S. No.	Course Content	Periods
<b>Unit I</b>	Concept of Health, Nutrition and Public Health Nutrition Demographic trends in India and the significance of certain indices of Health and Nutrition situation of a community. (IMR, MMR, TFR, Birth rate, Death rate, Life expectancy etc.) Major Nutritional problems in developing countries – PEM, Night blindness, Nutritional anaemia, Endemic, Goitre, Rickets, Osteomalacia, Beriberi, Pellagra etc.	<b>15</b>
<b>Unit II</b>	Dietary surveys – methods, ways of interpretations, and analysis, recommendations based on survey findings	<b>15</b>
<b>Unit III</b>	Assessment of Nutritional status – Nutritional Anthropometry, Biochemical assessment and observations for clinical signs – Interpretations of the result, comparisons with the standards, suggestions/ recommendations – growth monitoring for children below 10 years.	<b>15</b>

Course Code	Title	Periods/week	Marks	Credits
PSDDAN104	FOODS AND DIETETICS	3	100	3

S. No.	Course Content	Periods
<b>Unit I</b>	Objectives of cooking food Methods of cooking food Food acceptability and sensory evaluation Nutritive value of different food groups and changes due to cooking in the following food groups: Milk and Milk products, eggs, meat, poultry, sea food,	<b>15</b>
<b>Unit II</b>	Nutritive value of different food groups and charges due to cooking in the following food groups: Cereals and cereal products pulses and legumes, fruits, vegetables, sugar and confectionary, beverages, spices and condiments.	<b>15</b>
<b>Unit III</b>	Storage of foods. Food quality and factors affecting food quality. Control of food quality Use of food additives – Classification and applications	<b>15</b>

## References

Barbara Luke (1986) Principles of Nutrition and Diet Therapy, Little, Brown and Company, Boston  
Eva Medved (1986) Food – Preparation and theory, Prentice – Hall, Inc. Englewood Cliffs, New Jersey.  
Marion Bennion and Osee Hughes (1985) introductory Foods (6<sup>th</sup> Edition) Macmillan Publishing Co., Inc. New York. Collier Macmillan Publishers, London.  
Norman N. Potter (1986) Food Science 4<sup>th</sup> Edition Van Nostrand Reinhold Company, New York.  
Shakuntal N. Manay and Shadaksharaswamy M. (1987) Foods – Facts and Principles, Wiley Eastern Limited.

Course Code	Title	Periods/week	Marks	Credits
PSDDAN105	<b>FOOD SERVICE MANAGEMENT IN HOSPITALS AND OTHER INSTITUTIONS</b>	3	100	3

## Objectives

- To give students a basic understanding of the principles of management to apply them in food-service administration.
- To help the student understand what the basic tools of management are and their application in different types of food service institutions.
- To make the students aware of the methods of work improvement to increase productivity and efficiency.
- To enable the students to have a basic knowledge of menus, planning menus, standardizing menus and stepping up recipes.

S.No.	Course Content	Periods
<b>Unit I</b>	<b>Organisation And Management</b> Theories of Organisation Steps to start an Organization Types of Organizations (Food Service Institutions) Functions and tools of Management Hierarchy of management – top, middle, lower and the characteristics of each level. Role of supervisions in handling employees Qualities and skills for administrative leadership Professional and trade association in India pertaining to food-service / catering.	<b>15</b>
<b>Unit II</b>	<b>Food Service Institution</b> Categorization of food service institutions and their respective characteristics Factors affecting the development of food service institutions. Hotels / Hospitals as formal organization. Menus – factors to consider while planning menus, steps to plan a menu, menu design and evaluation; types of menus. Standardization of recipes – meaning advantages, methods used to standardize and step up recipes, how to develop a score card. Food service – types of food services systems and their characteristics: styles of service used, Management of food service.	<b>15</b>
<b>Unit III</b>	<b>Personnel Management</b> Employment Process – recruitment, selection, orientation, training, methods used for performance appraisal. Procedures relating to promotions, transfers, handling grievances and disciplinary action. Labour policies, financial and non-financial benefits given to employees Labour Management Relations – unionization and how to tackle it. Labour laws pertaining to the food service industry. Methods used for Work Improvement and suggestions for its application	<b>15</b>

## References

Auratramani P; 1982 “Catering Management for Indian Hotels”.Sudarshan Art Printing Press, Bombay.  
Betram P; 1975 “Fast Food Operations” Barrie and Jenkins Ltd. London.  
Davis B. and Stone S. 1985 “Food and Beverage Management” William Heinemann Ltd. London.  
Department of Health and Social Security Scottish Home and Health Department Northern Ireland, 1974 “Clean Catering” Her Majesty’s Stationery Office, London.  
Harger V.P.; Shugart G.SS.and Palacio J.P. 1986 “Food service in institutions” Macmillan Publishing Co. New York



Hooper W.E. 1970 "Book-keeping for beginners" Sir Isaac Pitman and Sons Ltd., Gt. Britain.  
 Hughes D. and Golzen G. 1985 "Running Your Own Restaurant" Kogan Page Ltd., London.  
 Kahrl W.L. 1974 "Food Service on a budget for Schools, Senior Citizens, Colleges, Nursing Homes, Hospitals, Industrial Correctional Institutions" Catners Publishing Co., Massachusetts.  
 Keiser J. and Kallino E. 1974 "Controlling and Analysing Costs in Food Service Operations" John Wiley and Sons inc., New York  
 Kinton R. and Ceseani V. 1985 "The Theory of Catering" Arnold Hermann Publishers India Pvt. Ltd., New Delhi.  
 Kotas R. and Davis B. 1981 "Foods and Beverage Control" international Textbook Company Ltd. Glasgow.  
 Peet L.J. and Thy S.L. 1963 "Household Equipment" John Wiley and Sons inc., New York.

Course Code	Title	Periods/week	Marks	Credits
PSDDAN106	CLINICAL NUTRITION	3	100	4

### Objectives

To enable students to:

- Study of the etiology, clinical symptoms and treatment with emphasis to dietary management
- Acquire knowledge about the causes, symptoms and the effect of various diseases on dietary requirements.
- Modify the normal diet for disease conditions based on the pathophysiology.
- Understand the role of the dietitian in the dietary treatment of the patients.

S. No.	Course Content	Periods
<b>Unit I</b>	Role of a dietitian: Education and personal qualifications, role and responsibilities of adietitian, nutrition counseling, professional ethics and obligations. Career opportunities for dietitians. Diet Therapy – rationale for diet therapy (The normal diet, Modifications of the diet to the light diet, soft diet, full liquid diet, clear liquid diet, Tube feedings); Routes for diet therapy – enteral and parental; use of biochemical parameters in the planning of diets, Use of computers in the planning of diets and hospital administration.	<b>15</b>
<b>Unit II</b>	Obesity and underweight Diabetes mellitus Gastro-Intestinal diseases: Reflux aesophagitis and hiatal hernia, Diarrhea and constipation, Peptic ulcers, Ulcerative colitis, Regional enteritis, Tropical and non-tropical spru, Diverticular disease, Intestinal obstruction and acute appendicitis, Lactose intolerance	<b>15</b>
<b>Unit III</b>	Diseases of the circulatory system: Hypertension, Atherosclerosis, Angina pectoris, IHD, Hyperlipidmias	<b>15</b>

### References

Anderson, Liennea, Dibble, Marjorie, Turkki, P.R.; Mitchell, Helen & Rynbergen, Henderika (1982) "Nutrition in Health and Disease" 17<sup>th</sup> Edition J.B. Lippincott Co. Philadelphia.  
 Antia, F.P. (1989) "Clinical Dietetics and nutrition" 3<sup>rd</sup> Edition Oxford University Press, Bombay.  
 Bennion Marion (1979) "Clinical Nutrition" Harper and Row Publishers Inc., New York.  
 Burton B.T. (1978) "Human Nutrition" 3<sup>rd</sup> Ed. Tata McGraw Hill Publishing Company Ltd. New Delhi.  
 Gopalan C., Rama Sastri, B.V. & Balasubramanian S.C.; Revised and updated by NarsinghaRao B.S. Deosthale, Y.G. & Pant, K.C. (1989) "Nutritive Value of Indian Foods" 2<sup>nd</sup> Ed. National Institute of Nutrition, Hyderabad  
 Halpern S.L. ed. (1987) "Quick Reference to Clinical Nutrition: A Guide Physicians" 2<sup>nd</sup> Edition J.B. Lippincott Company Philadelphia  
 Kinney, J.M.; Jeejeebhoy K.N. Hill G.L. and Owner, O.E. (1988) "Nutrition and Metabolism in Patient Care" W.B. Saunders & Co., Philadelphia  
 Krause, Marie, V. and Mahan, Kathleen, L. (1984) "Food, Nutrition and Diet Therapy – A textbook of Nutritional Care" 7<sup>th</sup> Ed. W.B. Saunders Co. Philadelphia  
 Mahan, Kathleen, L. & Arlin, Marian, T. (1992) "Krauses Food, Nutrition & Diet Therapy" 8<sup>th</sup> Ed. W.B. Saunders Co. Philadelphia.  
 Passmore, R. & Eastwood, M.A. (1986) "Davidson & Passmore – Human Nutrition & Dietetics" 8<sup>th</sup> ed. Churchill Livingstone, Edinburgh.  
 Robinson, Corinne, H.; Lawier, Marilyn, R., Chenoweth, Wanda, L. and Garwick, Ann, E. (1986) "Normal & Therapeutic Nutrition" 17<sup>th</sup> ed. Macmillan Publishing Co. New York.

Shah, S.J. (editor-in-chief) (1986) "A.P.I. Textbook of Medicine" 4<sup>th</sup> ed. Association of Physicians of India, Bombay.

Williams, Sue (1978) "Self-study guide for Nutrition and Diet therapy" 2<sup>nd</sup>ed. The C.V. Mosby Company, Saint Louis.

Zeeman, Frances, J. and Ney, Denise, M. (1988) "Applications of Clinical Nutrition" Prentice hall, New Jersey.

Course Code	Title	Periods/week	Marks	Credits
PSDDANP101	<b>DIET THERAPY</b>	<b>8</b>	<b>100</b>	<b>2</b>

**Objectives**

- To enable the students to suggest suitable diets for various diseased conditions.
- To enable them to develop standards of dietetic practice in consonance with advances in the field of diet therapy.

S. No.	Course Content	Periods
<b>Unit I</b>	Standardization of portion sizes, Preparation of normal diets served in hospitals,	<b>15</b>
<b>Unit II</b>	Modification of normal diets to liquid diets, soft diets, full liquid diet, clear liquid diet, tube feeding.	<b>15</b>
<b>Unit III</b>	<b>Dietary Management in the treatment of following conditions</b> Obesity and underweight, Low Calorie diets, Child and Adult weight reduction	<b>15</b>
<b>Unit IV</b>	<b>Diabetes Mellitus</b> , without Insulin, with Insulin, with insulin – adult & juvenile, diabetes in pregnancy, Hypo-glycemic conditions.	<b>15</b>
<b>Unit V</b>	<b>G.I. diseases:</b> Diarrhoea and Constipation, Peptic Ulcer, Lactose intolerance, Ulceratecolitis, Conditions of intestinal obstruction and acute appendicitis, Hiatus Hernia	<b>15</b>
<b>Unit VI</b>	<b>Diseases of the circulatory system:</b> Hypertension, Atherosclerosis, Angina Pectoris, IHD, Low Calorie, low cholesterol and low sodium diets for acute and chronic conditions	<b>15</b>

Course Code	Title	Periods/week	Marks	Credits
PSDDANP102	<b>CLINICAL TESTING AND FOOD ANALYSIS</b>	<b>3</b>	<b>50</b>	<b>2</b>

**Objectives**

To impart knowledge of the normal and abnormal constituents present in the biological samples and of the principles on which the above estimations are carried out.

To impart skills in the handling of glassware and instruments used in the laboratory and skills in the different techniques involved in the collection and analysis of biological samples.

S. No.	Course Content	Periods
<b>Unit I</b>	Standardization of acids and alkalies, Blood collection and preservation, Preparation of anticoagulants, Determination of bleeding time and clotting time, Determination of Hb, ESR, MCV, PCV and WBC, RBC count, Determination of blood pressure.	<b>15</b>
<b>Unit II</b>	Estimation of: Serum iron, protein, BUN, bilirubin, triglycerides, SGOT, SGPT. Estimation of blood glucose and glucose tolerance test, Detection of normal and abnormal constituents of urine.	<b>15</b>
<b>Unit III</b>	Estimation of ascorbic acid in urine and ascorbic acid load test. Estimation of creatinine in blood and urine., Estimation of Na & K (demonstration) by flame photometer	<b>15</b>

Course Code	Title	Periods/week	Marks	Credits
PSDDANP103	<b>APPLIED NUTRITION AND PUBLIC HEALTH</b>	<b>2</b>	<b>50</b>	<b>2</b>

**Objectives**

- Students understand Nutrition and Health situations India.
- Students know their role as a dietitian in improving the nutritional and Health Status of the vulnerable groups and the overall community.

- Students acquire skills in assessing Nutritional status of the people, skills in communications and planning, organizing abilities required for conducting nutrition education programmes.
- Students develop the right attitudes towards working in the communities.

<b>S. No.</b>	<b>Course Content</b>	<b>Periods</b>
<b>Unit I</b>	Preparation and use of visual aids for nutrition education – Posters, Flash Cards, Flip books, Puppets etc.	<b>15</b>
<b>Unit II</b>	Acquiring skills for using methods of communicating Nutrition messages – Role plays, Demonstrations, Puppet shows, Group Discussions, games etc.	<b>15</b>

#### **References**

- Swaminathan M.S., 1985 Essential of Foods & Nutrition, the Bangalore Printing & Publishing Company Ltd.
- Gopaldas t. Sheshadri S. (eds) (1987) Nutrition: Monitoring and Assessment. Oxford University Press.
- Jellief D.B. (1966)., The assessment of Nutritional status of the community, WHO, Geneva.
- Shukla P.K. (1982). Nutritional Problems in India. Prentice – Hall of India, Private Limited, New Delhi.
- Bagchi K. 1977., Nutrition Education through health care system. WHO offset document, : WHO Geneva.

**POST-GRADUATE DIPLOMA IN DIETETICS AND APPLIED NUTRITION****Semester II**

<b>Course Code</b>	<b>Subject</b>	<b>Periods/ week</b>	<b>Semester End Exam Marks</b>	<b>Internal Marks</b>	<b>Total Marks</b>	<b>Credits</b>
PSDDAN201	Physiology	2	60	40	100	3
PSDDAN202	Basic Nutrition	3	60	40	100	3
PSDDAN203	Applied Nutrition and Public Health	2	60	40	100	3
PSDDAN204	Foods and Dietetics	3	60	40	100	3
PSDDAN205	Food Service Management	3	60	40	100	3
PSDDAN206	Clinical Nutrition	3	60	40	100	3
PSDDANP201	Diet Therapy	8	100	--	100	2
PSDDANP202	Food Analysis	3	50	--	50	2
PSDDANP203	Applied Nutrition and Public Health Part A: Field Work	2	50	---	50	2
	Part B: Rural Camp	3 Working days in the year				
	Part C: Hospital Internship	2 months				
<b>Total</b>					<b>800</b>	<b>24</b>

Course Code	Title	Periods/week	Marks	Credits
PSDDAN201	PHYSIOLOGY	2	100	3

#### Objectives

- To enable the students to understand the functions of the body in health and its adaptation to changed conditions.
- To enable the students to understand the implications of dietary modifications on the functioning of the various systems.

S. No.	Contents	Periods
Unit I	Reproductive system: Physiology of menstruation pregnancy and lactation. Respiratory System : Mechanism of respiration, Acid-base balance	15
Unit II	Nervous System:- The introduction to central and autonomic nervous system, fundamental principles of nervous control, reflex actions, regulations by higher centres Musculo-Skeletal System: Structure and classification of bones. Axial and Appendicular skeletal structure, voluntary and involuntary muscles, physiology of contraction and relaxation of muscles	15

#### References

Best and Taylor, (1975), The living Body. Chapman and Hall Ltd., London  
 Chatterjee C.C. (1988). Human Physiology, 10<sup>th</sup> Edition, Medical Allied Agency  
 Guyton A.C., (1986), Textbook of Medical Physiology, Saunders Company  
 Tortora G.J. and Anagnostakos N.P. (1990). Principles of Anatomy and Physiology, 6<sup>th</sup> Edition. Harper and Row

Course Code	Title	Periods/week	Marks	Credits
PSDDAN202	BASIC NURITION	3	100	3

#### Objectives

- To create a better understanding of the basic aspects of human nutrition by providing information on the current concepts of nutritional principles
- To give a simple account of the metabolism and functions of the major dietary constituents and their nutritional and clinical importance.
- To study the interrelationships between nutrients along with their recommended allowances and food sources so as to enable students to become aware of the importance of a balanced diet based on sound nutritional principles.

S. No.	Course Content	Periods
Unit I	<b>Vitamins:</b> Physiological and biochemical role of fat and water soluble vitamins, sources, Digestion, absorption, transport, utilization, disposal and storage, Requirements and recommended allowances under normal and stress conditions, Effects of deficiency and excess.	15
Unit II	<b>Minerals:</b> Classification of macro and micro nutrients along with their physiological and biochemical role. Absorption, utilization and distribution in the body. Food sources and recommended allowances. Effects of deficiency and excess in the diet.	15
Unit III	<b>Fluid and electrolyte balance:</b> Total body water as well as content of intracellular and extracellular fluid Water loss and balance, Role of hormones in water balance, water intoxication, Interrelationship of body fluids. <b>Acid base balance – Body water and functions of water:</b> Distribution of body water, Water balance and elimination, Electrolytes: their functions, absorption, excretion, recommended intake and sources. <b>Interrelationships between nutrients</b> Protein and energy, Protein, Fat, Carbohydrates Vitamin D, Calcium and Parathyroid hormone, Vitamin E and PUFAs, Vitamin C and Iron Vitamin B12 and Folic acid.	15

#### References

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Course Code	Title	Periods/week	Marks	Credits
PSDDAN203	APPLIED NUTRITION AND PUBLIC HEALTH	2	100	3

#### Objectives

- To enable the students to understand Nutrition and Health situations India.
- Know their role as a dietician in improving the nutritional and Health Status of the vulnerable groups and the overall community.
- Acquire skills in assessing Nutritional status of the people, skills in communications and planning, organizing abilities required for conducting nutrition education programmes.
- Develop the right attitudes towards working in the communities.

S. No.	Course Content	Periods
Unit I	Health and Nutrition policies of the Govt. and their implementation – problems encountered. Impact of following factors on food consumption and nutritional status of people – Agricultural production, storage distributions, population, science and technology, socio- cultural and economic factors. Steps taken by the Govt. and N.G.O.'s to overcome the problem faced due to the above factors	15
Unit II	Nutrition feeding Programmes in India and their role in Improving Nutritional status of the weaker sections and vulnerable groups of any community – ANP, SNP, BNP, ICDS, MDM, Vit a prophylaxis, Goitre and anaemic control etc. National and International agencies involved in promoting Nutrition and health status of a community – UNICEF, FAO, WHO, CARE, NIN, CFTRI, ICMR, etc.	15
Unit III	Nutrition Extension and Education – Objectives, plan and methods of nutrition education. Food fads and fallacies. – Importance and ways of effective communication and community participation in any nutrition education programmes. Food adulteration and related laws. Common Food Adulterants, methods of directing them – role of PFA, ISI, AGMARK, INTERNATIONAL CODED, STANDARDS, FSSAI.	15

Course Code	Title	Periods/week	Marks	Credits
PSDDAN204	FOODS AND DIETETICS	3	100	3

S. No.	Course Content	Periods
Unit I	Food spoilage and factors affecting food spoilage Food preservation Methods of preservation – Dehydration, freezing and canning, radiation, use of microwaves, home-scale methods of preservation and fermentation. Use of processed foods and their contribution to the daily diet. Role of packaging in maintaining quality of processed foods.	15
Unit II	Use of processing technology for- Breakfast cereals, Alcoholic beverages, vegetable and fruit products, flesh foods, milk and milk products, egg and egg products.	15
Unit III	Concepts of an adequate diet, food budget proportionate cost of various foods in relation to their nutrient content. Principles involved in Planning diets. Normal Dietetics – Meal planning for the family at various stages of the life cycle – infancy to old age factors, affecting food habits and their modifications, cultural food patterns in India.	15

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Course Code	Title	Periods/week	Marks	Credits
PSDDAN205	FOOD SERVICE MANAGEMENT	3	100	3

## Objectives

- To give students a basic understanding of the principles of management in order to apply them in food-service administration.
- To help the student understand what the basic tools of management are and their application in different types of food service institutions.
- To make the students aware of the methods of work improvement to increase productivity and efficiency.
- To make the students aware of the fundamentals of costing and accounting as practiced in food-service institutions.
- To help the student understand the basic principles of planning the physical plant, layout and equipment of a food service institution.

S. No.	Course Content	Periods
<b>Unit I</b>	<b>Purchase and Storage</b> Purchasing – types of markets, marketing channels involved, methods of purchase. Storage – ideal storage requisites for dry and cold storage, arrangement of stores. <b>Floor Planning and Layout</b> Factors to consider in floor planning related to type of food service. Layout design – space allowances, space relationships, basic and ideal requirements for each work area Basic principles to follow while drawing out a floor plan.	<b>15</b>
<b>Unit II</b>	<b>Equipment used in Food Service Organization</b> Factors affecting selection of equipment Features to note during purchase of equipment Classification of food service equipment: types of equipment found in specific work areas; construction mode of operation and care of major equipment commonly used. Fuels – types used and relative advantages of each. Computer application (robots included) in food service institutions. <b>Safety and Sanitation</b> Food Spoilage and types General reasons for food borne disease outbreaks, Common food borne diseases – causes, symptoms, prevention Importance of safety and sanitation Protective measures employed with respect to personnel, layout and equipment to make the work environment hygienic and safe.	<b>15</b>
<b>Unit III</b>	<b>Financial Management</b> Elements of cost – food labour, operating costs, gross profit, net profit, relationship of the different costs to sales, break-even analysis. Cost control – factors affecting the different costs, records used. Budget – objective, advantages, steps to plan a budget, types of budget. Basic Accounting Principles – explanation of basic terminology used in accounts, double-entry, book keeping and its advantages, types of accounts, basic books used in accounts, explanation on the use of trial balance, profit and loss statement and balance sheet.	<b>15</b>

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Course Code	Title	Periods/week	Marks	Credits
PSDDAN206	CLINICAL NUTRITION	3	100	3

## Objectives

To enable students to:

- Study of the etiology, clinical symptoms and treatment with emphasis to dietary management
- Acquire knowledge about the causes, symptoms and the effect of various diseases on dietary requirements.
- Modify the normal diet for disease conditions based on the pathophysiology

S. No.	Course Content	Periods
<b>Unit I</b>	Liver and Gall bladder diseases, Hepatitis, Cirrhosis, Hepatic coma, Wilson's disease, Cholelithiasis, Cholecystitis Kidney disease: Acute and chronic glomerunephritis, Nephritic syndrome, Renal failure, Nephrolithiasis	<b>15</b>
<b>Unit II</b>	Diseases of the nervous system, Cerebrovascular diseases, Epilepsy, Endocrine diseases, Thyroid diseases, Parathyroid disease, Adrenal disease, Anemias, protein energy malnutrition	<b>15</b>
<b>Unit III</b>	Infections like T.B., measles, chicken pox, malaria, Allergy, Febrile conditions, Cancer, Arthritis and musculoskeletal disorders, Inborn errors of metabolism Nutritional management of low birthweight infants Dietary management in surgical conditions, trauma and burns Drug and nutrient interaction.	<b>15</b>

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Course Code	Title	Periods/week	Marks	Credits
PSDDANP201	DIET THERAPY	8	100	2

#### Objectives

- To enable the students to suggest suitable diets for various diseased conditions.
- To enable them to develop standards of dietetic practice in consonance with advances in the field of diet therapy.

S. No.	Course Content	Periods
Unit I	<b>Kidney diseases:</b> Acute & Chronic Glomerulonephritis, Nephrotic syndrome	15
Unit II	<b>Kidney diseases:</b> Renal failure, Nephrolithiasis, Dialysis, Renal Transplant	15
Unit III	<b>Liver diseases and gall bladder</b>	15
Unit IV	<b>Allergy</b>	15
Unit V	<b>Diets of stressed patients :</b> Burns, Cancer, Surgery	15
Unit VI	<b>Nutritional management of low birth weight infants:</b> Pediatric diets, Infant diets & supplementary foods	15

Course Code	Title	Periods/week	Marks	Credits
PSDDANP202	CLINICAL TESTING AND FOOD ANALYSIS	3	50	2

#### Objectives

To impart knowledge of the normal and abnormal constituents present in the biological samples and of the principles on which the above estimations are carried out.

To impart skills in the handling of glassware and instruments used in the laboratory and skills in the different techniques involved in the collection and analysis of biological samples.

S. No.	Course Content	Periods
Unit I	Qualitative analysis of sugars, Estimation of sugars in food samples (milk, sugarcane, biscuits, etc.), Qualitative analysis of amino acids	15
Unit II	Determination of moisture and ash content in food samples, Estimation of minerals in food samples – iron, phosphorus, calcium, Estimation of ascorbic acid in foods (sprouted pulses, cauliflower, beverages, etc.)	15
Unit III	Estimation of tannin content in food samples., Estimation of crude fibre, Detection of food adulterants, Estimation of protein and fat content in food samples. Na and K content of certain foods using flame photometry	15

Course Code	Title	Periods/week	Marks	Credits
PSDDANP203	APPLIED NUTRITION AND PUBLIC HEALTH	2	50	2

#### Objectives

- Students understand nutrition and health situations India.
- Students know their role as a dietician in improving the nutritional and health status of the vulnerable groups and the overall community.
- Students acquire skills in assessing nutritional status of the people, skills in communications and planning, organizing abilities required for conducting nutrition education programmes.
- Students develop the right attitudes towards working in the communities.

<b>S. No.</b>	<b>Course Content</b>	<b>Periods</b>
<b>Unit I</b>	Developing and demonstration of low cost nutritious recipes for children, (0-1, 1-3, 3-6 years) pregnant and nursing mothers. Modifying the recipes according to rural/urban set up. Developing a dietary survey form and collecting and analyzing information	<b>15</b>
<b>Unit II</b>	Planning, organising and imparting nutrition education sessions for a given community	<b>15</b>

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### Scheme of Examination

The performance of the learners shall be evaluated into two parts. The learner's performance shall be assessed by Internal Assessment with 40% marks in the first part by conducting the Semester End Examinations with 60% marks in the second part. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

#### **Internal assessment for Theory 40 % (40 marks)**

Sr. No.	Evaluation type	Marks
1	One seminar based on curriculum assessed by teacher of the institution teaching PG learners / Publication of a research paper/ presentation of a research paper in seminar or conference. A. Selection of the topic, introduction, write up, references- 15 marks. B. Presentation with the use of ICT- 15 marks.	30
2	Active participation in routine class instructional deliveries	05
3	Overall conduct as a responsible learner, communication and leadership qualities inorganizing related academic activities	05

#### **Semester End Examination for Theory 60% (60 marks)**

**Duration:** These examinations shall be of two and half hours duration.

##### **Theory question paper pattern:**

- There shall be five questions each of 12 marks. On each unit there will be one question and the last one will be based on entire syllabus.
- All questions shall be compulsory with internal choice within the questions. Each question will be of 18-24 marks with options.
- Question may be subdivided into sub-questions a, b, c... and the allocation of marks depend on the weightage of the topic.

#### **Practical Semester End Examination of 50 marks (No Internal Assessment)**

**Duration:** These examinations to be conducted for three hours.

Sr. No.	Evaluation type	Marks
1	Laboratory work: <b>Semester End Examination</b>	40
2	Journal	05
3	Viva	05

#### **Practical Semester End Examination of 100 marks (No Internal Assessment)**

**Duration:** These examinations to be conducted for three hours.

Sr. No.	Evaluation type	Marks
1	Laboratory work: <b>Semester End Examination</b>	80
2	Journal	10
3	Viva	10

**Standard of Passing** is as per the ordinances set by the University of Mumbai for the Credit Based Semester and Grading System for the postgraduate courses.

##### **Some considerations**

- The program is practical oriented with more emphasis on clinical aspects than the biochemical aspects.
- T. Y. B. Sc. (Home Science Branch I Foods Nutrition and Dietetics) students may be given an option to attend the lectures conducted for this course. If students choose not to attend these classes they are expected to present a term paper on a particular topic as assigned by the course teacher that will be marked/graded. All students must appear for the tests/exams for internal and semester end examinations.
- **Field Visits:** Students must submit reports on their observations in the institution visited.
- **Rural Camp:** Each student will go to a selected slum/community/institution for 15 turns or days and organize at least five concrete programmes)
- **Hospital Internship:** For a period of at least two months in hospitals, students are expected to collect six case histories and submit a report. One of the case histories should be presented and the presentations should be evaluated.