POST GRADUATE DIPLOMA IN NUTRITION AND DIETETICS

(Semester: I & II)
(Under Continuous Evaluation System)
Session: 2024-25

The Heritage Institution
KANYA MAHA VIDYALAYA JALANDHAR
(Autonomous)

PROGRAMME SPECIFIC OUTCOMES OF POST GRADUATE DIPLOMA IN NUTRITION AND DIETITICS
(Session 2024-25)

PSO1. To recognize different systems including cardiovascular, urinary system, digestive system in our body.

PSO2. Work and communicate with people who are vulnerable those who are able to have food at proper time and educate them about malnutrition, nutrition and benefits of current nutrition programmes run by government.

PSO3. To understand the issues regarding meal planning in hospital , its organization , management , personal management , principle resources and equipments used in catering industry.

PSO4. To understand the industrial hygiene, environment, sanitation, public health and to control of infection in catering establishment. To gain knowledge about microbiology bacterial food poisoning and food preservation.

PSO5. To understand the basic principle of therapeutic diets, different types of diets to be given in different diseases.

PSO6. To understand the concept of social welfare, its agencies and institution involved in social welfare.

KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF ONE YEAR DIPLOMA PROGRAMME

Programme: Post Graduate Diploma in Nutrition and Dietetics

Credit Based Continuous Evaluation Grading System (CBCEGS)

(Session 2024-2025)

Semester-I										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
PNDL- 1281	Physiology	C	4-0-0	4-0-0	4	100	70	-	30	3
PNDL- 1282	Community Nutrition and Social Welfare	C	4-0-0	4-0-0	4	100	70	-	30	3
PNDL- 1283	Institutional Food Administration	C	4-0-0	4-0-0	4	100	70	-	30	3
PNDM - 1284	Nutritional Biochemistry	C	2-0-4	2-0-2	4	100	50	20	30	3+3
PNDP- 1285	Community Nutrition and Social Welfare (Practical)	C	0-0-6	0-0-2	2	50	-	35	15	3
PNDP- 1286	Institutional Food Administration (Practical)	C	0-0-6	0-0-2	2	50	-	35	15	3
PNDL- 1287	Basic Nutrition	D		-		50	50	-	-	3
TOTAL CREDITS					**20**	**500**				

C- Compulsory Course
D- Deficient Paper

Post Graduate Diploma in Nutrition and Dietetics Semester –I

(Session 2024-2025)

PHYSIOLOGY

(Theory)

COURSE CODE: PNDL – 1281

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To develop the knowledge of cell structure and functions of inclusion bodies and to have the knowledge of structure and functions of blood and cardiovascular system.

CO2. To have the knowledge of structure and functions of renal and nervous system.

CO3. To develop the knowledge about digestive system, its structure, function, digestion and absorption of carbohydrates, proteins and fats. To gain knowledge about respiratory system and it's functioning.

CO4. To develop the knowledge of structure and functioning of endocrine and reproductive systems

Post Graduate Diploma in Nutrition and Dietetics

Semester - I

(Session: 2024-2025)

PHYSIOLOGY

(Theory)

COURSE CODE: PNDL - 1281

Time:3 Hours **Max. Marks: 100**

L-T-P **Theory: 70**

4-0-0 **CA: 30**

Instructions for the Paper Setter

- Eight questions of equal marks are to be set; two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section.
- Each question carry 14 marks.

Unit I

1. Review of cell structure and functions of inclusion bodies.
2. Blood and Cardio Vascular System:
   - Composition of blood: haemoglobin, plasma, platelets and leucocytes
   - Erythropoiesis and coagulation of blood.
   - ABO blood group and Rh blood group.
   - Basic structure of heart, cardiac output.
   - Brief overview of cardiac cycle.
   - Blood pressure and factors affecting it
   - Hypertension
   - ECG

Unit II

3. Physiology of Kidneys:
   - Structure and function of kidney
   - Mechanism of urine formation.
   - Regulatory functions of the kidney.
   - Acid Base balance.
   - Role of kidney in homeostasis.
   - Role of kidney in regulation of body temperature.
4. Physiology of nervous system
   - Nervous System:
   - Structure and functions of nerve and receptor cells.
   - Transmission of nerve impulse
   - Synapse formation.
   - Autonomic Nervous System: Sympathetic and parasympathetic nervous system.
   - Concept of neurotransmitters.

- Acid Base balance.
- Role of kidney in homeostasis.
- Role of kidney in regulation of body temperature.

Unit III

5. Physiology of respiratory system
   - Structure of respiratory system.
   - Mechanism of respiration and its regulation.
   - Oxygen and carbon dioxide transport in blood.
   - Lung volume and capacity
6. Physiology of the digestive system:
   - Structure
   - Functions and regulation of the salivary glands, stomach, pancreas, liver and the intestines.
   - Mechanism of digestion and absorption of carbohydrates, proteins and fats.
   - Role of enzymes in digestion of carbohydrates, proteins and fats.

Unit IV

7. Physiology of endocrine glands:
   - Definition, functions and kinds of hormones.
   - Structure and functions of the following glands: Thyroid, parathyroid, adrenal, pancreas, pituitary and pineal gland.
8. Physiology of reproductive system
   - Structure & function of male and female sex glands and organs.
   - Ovarian and menstrual cycle.
   - Role of hormones in reproduction: FSH, LH, Estrogen, Progesterone, Testosterone and Human Chorionic Gonadotropic hormone(HCG).
   - Placenta.
   - Physiology of pregnancy, parturition, lactation and menopause.

References:

1. Bloom, W. And Fawceitt, D.W.A. Text Book of Histology W.B. Saunders of Company,1968.
2. Guyton, AC, Text Book of Medical Physiology W.B. Saunders &Company.
3. Strand, F.L. Modern Physiology. Macmillan Publication.
4. Davidson, B. And Smith E., Text Book of Physiology and Biochemistry,1970

Post Graduate Diploma in Nutrition and Dietetics

Semester – I

(Session 2024-2025)

COMMUNITY NUTRITION AND SOCIAL WELFARE

(Theory)

COURSE CODE: PNDL - 1282

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO.1 To develop the knowledge of major nutritional problems, factors affecting food consumption and mal-nutrition, measures to overcome malnutrition. To have the knowledge of Health care system.

CO.2 To have the knowledge of Inter-relationship between nutrition and infection, Loss of nutrients on contamination, Role of national and international agencies in food and nutrition activities, To understand about food adulteration, laws governing food standards and common methods to detect food adulteration.

CO.3 To develop the knowledge about nutritional assessment, Feeding programmes in the country, Nutritional education, it's importance, planning and implementation.

CO.4 To develop the knowledge of social welfare and social work, broad fields of social welfare and social welfare agencies involved in social welfare.

Post Graduate Diploma in Nutrition and Dietetics (Semester-I)
(Session 2024-2025)
COMMUNITY NUTRITION AND SOCIAL WELFARE
(Theory)
COURSE CODE: PNDL - 1282

Time:3 Hours **Max. Marks:100**
L-T-P **Theory: 70**
4-0-0 **CA: 30**

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section.
- Each question carry 14 marks.

Unit I

1. Major Nutritional Problems. Economics of Nutrition.
2. Factors Affecting Food Consumption, Malnutrition.
   - Measures to overcome malnutrition. Application of basic principles of nutrition to improve the dietary practices of communities.
   - Nutrition adaptation.
3. Nutritional measures to overcome malnutrition:
   - Germination, Fortification, Supplementation
   - Enrichment, Parboiling
   - GM foods, Unconventional foods
   - Green revolution and white revolution.
4. Health care system:-Health care service providers (primary, secondary and tertiary system).

Unit II

5. Nutrition and infection.
6. Economic of sanitation of food nutrition – loss of food nutrients on contamination with chemical poisons, parasitic and microbial.
7. National and international organization engaged in foods and nutrition activities.
   (a) National: Role of voluntary agencies and state programmes, contribution of ministries of agriculture and health, ICMR, NIN, CSIR, CFTRI and ICAR.
   (b) International: FAO, WHO,UNICEF.
8. Food Adulteration:
   - Laws governing the food standards.
   - Common methods of detecting food adulteration at home
9. Food and nutrition security:
   - Concept of food security
   - Factors underlying food and nutrition security
   - Right to food act2009
   - Laws related to food safety – HACCP, FSSAI

Unit III

10. (a).Assessing the food and nutritional problems in the community. Methods for assessment of Direct Assessment: Clinical sign, nutritional anthropometry, biochemical tests, and biophysical methods.
    (b). Indirect Assessment: Vital statistics nutritionally relevant diseases, assessment of ecological survey, and technique of diet and nutrition survey.
11. Objectives and operations of feeding programmes in the country:-9th five year plan.
    - Pre-School feeding programme.
    - School lunch programmes.
12. Nutrition Education:
    - Study of existing daily dietary pattern in relation to socio-economic and Psychological aspects, importance of nutrition education for the community, technique, nutrition education through reading programmes.
    - Training workers in nutrition education and feeding integration of nutrition education with extension work.
    - Principles of planning, executing and evaluating the nutrition education programmes

Unit IV

13. Concept of Social Welfare:
    - Meaning, Importance.
    - Social welfare as distinguished from social work, social service, social reform and social action.

14. Broad fields of social welfare.

    - Family and child welfare
    - Medical and psychiatric welfare
    - Correctional service

15. Social welfare agencies and institutions involved in social welfare:
    - Social welfare administration
    - Functioning of central and state government.
    - Ministries and departments of social welfare
    - Trends in social welfare administration
    - Central social welfare board
    - Kasturba Gandhi National Memorial Trust

16. Social welfare agencies and institutions involved in social welfare:
    - Bhartiya Grameen Mahila Sangh
    - All India women's conference
    - Women's voluntary service
    - The All India Conference Of Social Work
    - The Home Science Association Of India
    - Local Organization – Official and non-official, involved in social welfare.

▪

Reference Books:

- Community Nutrition, Textbook of Public nutrition IGNOU
- Institutional Food Administration, Mohini Sethi
- Bloom, W. And Fawceitt, D.W.A. Text Book of Histology W.B. Saundersof Company,1968.
- 2. Guyton, AC, Text Book of Medical Physiology W.B. Saunders &Company.
- Clarke, Helen, Principles and Practices of Social work, Acolaton,Century-crofts, Ince, New York,1947.
- Young Husband, Eileon, Social work and Social Change, George Allan and Unwin

Ltd.,Ruskin House Museum Street, London,1964.

- Fariodlander, Walter, A Concept and Methods of Social Work, Prentice Hall ofIndia (Pvt).Ltd., New Delhi,1964.
- E. Wilson, Everett, E. and Convener, Merrill B. The Field of Social work, Henry Holt and Company, New York,1958.
- Nagpaul, Hans, The study of India society, Sociological Analysis of Social Welfare and Social Work Education, S. Chand and Co. Pvt. Ltd., New Delhi

Post Graduate Diploma in Nutrition and Dietetics

(Semester-I)

(Session 2024-2025)

INSTITUTIONAL FOOD ADMINISTRATION

(Theory)
COURSE CODE: PNDL - 1283

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To review different types of institutional food services, their operations-commercial and non-commercial, Theories of organization, Personnel management.
CO2. To develop the knowledge about staff employment, training, development and employees benefits.
CO3. To impart knowledge about food cost analysis – pricing, accountancy, books of account, Principal resources and Financial management.
CO4. Physical plan of kitchen unit, storage unit, service unit, dish washing, Catering equipments and their maintenance.

Post Graduate Diploma in Nutrition and Dietetics (Semester -I)
(Session 2024-2025)
INSTITUTIONAL FOOD ADMINISTRATION
(Theory)
COURSE CODE: PNDL - 1283

Time:3 Hours **Max.Marks:100**

L-T-P **Theory: 70**

4-0-0 **CA: 30**

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabusrespectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section**.**
- Each question carry 14 marks.

Unit I

1. Meal Planning in Institution**:** Basic factors in institutional meal planning.
   - Menu types of service portion control.
   - Maintenance of standard serving methods
   - Techniques of preparation of food in large quantity,
   - Food habits, food costs, maintenance, use of waste foods.
   - Standardization of common food preparation

2. Organization: Theories of organization, different types.
   - Commercial and Non Commercial Institutions.
3. Personnel Management:
   - Definition and scope
   - Approaches: Autocratic, Bureaucratic, Democratic, Scientific, and Technological
   - Personnel policies
   - Functions of a personnel manager

Unit II

4. Staff training and development
   - Training: Definition, Importance
   - Staff development: Principles, Process.

5. Staff employment:
   - Advertising
   - Recruiting: Process and sources-Internal and External
   - Selecting: Interview, tests
   - Employment and wages
   - Orientation: Importance, Types: Formal, Informal.

6. Employee benefits:
   - Physical needs
   - Physiological needs
   - Social- psychological needs
   - Principles of employee benefits
   - Employee welfare schemes in India

Unit III

7. Food cost analysis
    - Pricing: Definition, factors affecting pricing
    - Basic concepts in accountancy: Cash memo, Receipt, Pay-in-slip, Cheques, Vouchers

    Books of Account: Journal, Sales Return Book, Purchases Return Book, SalesBook, Purchase Book, Cash Book, Ledger

8. Principal Resources: Money – use of money, factors affecting cost control – cost concepts, types, element. Importance of cost control, methods of purchasing and requisition and inventory. Use of ledgers and basic knowledge of trading (profit and loss account and balance sheet).

9. Financial management:
    - Importance of Financial Management in a food based enterprise
    - Budgets and Budgeting process
    - Costing: Concept, Types, Control
    - Records: Menu, Purchase, Store, Production, Sales, Personnel, Utilities
    - Cost analysis: Concept of Trial Balance, Profit and Loss Account, Balance sheet

Unit IV

10. Physical Plant**:** Location floor plans space allowances, kitchen unit, storageunits, serving unit and dish washing etc. work simplification.
11. Catering equipment:
    - Types of Equipment
    - Factors affecting selection of Equipments
    - Equipment design, installation and operation
    - Care and maintenance of Equipments.

References

- Nutrition in India – Patwardhan V.N.
- Nutrition and physical fitness – Bougert L.J.
- Nutrition evaluation of food processing, Roberts Haris, John Wiley and Sons, New Yorkand London.
- Community Nutrition, Textbook of Public nutrition IGNOU
- Institutional Food Administration, Mohini Sethi

Post Graduate Diploma in Nutrition and Dietetics (Semester-I)

(Session: 2024-2025)

NUTRITIONAL BIOCHEMISTRY

COURSE CODE: PNDM – 1284

COURSE OUTCOMES:

CO (1): To Understand the knowledge of Classification and properties of bio molecules.

CO (2): To Understand the concept of Intermediary Metabolism of Carbohydrates, Proteins and lipids

CO (3): To review the knowledge of Enzymes, Hormones and Inborn errors of metabolism.

CO (4): to Understand the Concept of Vitamins, Minerals and Antioxidant

Post Graduate Diploma in Nutrition and Dietetics (Semester-I)

(Session: 2024-2025)

NUTRITIONAL BIOCHEMISTRY

(Theory)

COURSE CODE: PNDM - 1284

Time:3 Hours | **Max.Marks:100**

L-T-P | **Theory: 50**

2-0-2 | **Practical: 20**

CA: 30

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section**.**
- Each question carry 10 mark.

Unit I

1 Classification and properties of bio molecules:

- Carbohydrates- Classification and importance of Monosaccharides, Disaccharides and Polysaccharides (without structures)
- Classification of lipids (without structures)
- Classification of amino acids and proteins- Essential and non-essential amino acids (without structures)

Unit II

2. Intermediary Metabolism: Overview (no structures)

- Carbohydrates- Glycolysis, Gluconeogenesis, TCA cycle, Blood sugar regulation
- Proteins- Urea cycle
- Lipids- β-oxidation and de novo synthesis of fatty acids, ketone bodies

Unit III

3. Enzymes:

- Definition and classification of enzymes; Coenzymes
- Factors affecting enzyme catalysis

4. Hormones:

- Introduction to hormones
- Mechanism of hormone action; Biological role of Insulin and Glucagon

5. Inborn errors of metabolism

Unit IV

6. Vitamins: Vitamins- Biochemical role

- Fat soluble vitamins – A, D, E & K
- Water soluble vitamins– (B1 and B2 only) and C

7. Minerals (elementary aspects):

- Macro minerals– Calcium, Sodium, Potassium, Magnesium
- Microminerals– Iron, Copper, Zinc, Iodine.

8. Antioxidants

References:

- Textbook of Biochemistry IGNOU

- Berg JM, Tymoczko JL and Stryer L. (2002) Biochemistry 5th ed. W.H. Freeman.
- West ES, Todd WR, Mason HS and Van Bruggen JT: Textbook of Biochemistry, 4th Ed. Amerind Publishing Co. Pvt. Ltd.
- Murray RK, Granner DK, Mayes PA and Rodwell VW, (2003) Harper's Illustrated biochemistry, 26th ed. McGraw-Hill(Asia).
- Nelson DL and Cox MM. (2005) Principles of Biochemistry, 4th ed. Freeman and Company.
- Voet D and Voet JG. (2004) Biochemistry 3rd ed. John Wiley and Sons.
- Principles of Biochemistry by Lehninger
- Biochemistry by U. Satyanarayana and U. Chakrapani

Post Graduate Diploma in Nutrition and Dietetics
(Semester-I)
(Session: 2024-2025)
NUTRITIONAL BIOCHEMISTRY
(Practical)
COURSE CODE: PNDM – 1284

COURSE OUTCOMES:

CO (1): Qualitative analysis of monosaccharide, disaccharide and polysaccharide. CO (2):

Quantitative estimation of glucose.

CO (3): To test the reaction of protein fats and carbohydrate in bread, milk and egg.

Post Graduate Diploma in Nutrition and Dietetics (Semester-I)

(Session: 2024-2025)

NUTRITIONAL BIOCHEMISTRY

(Practical)

COURSE CODE: PNDM-1284

Time:3 Hours **Max. Marks: 20**

CONTENTS:

1. Qualitative analysis of monosaccharide, disaccharide and polysaccharide.
2. Quantitative estimation of glucose.
3. To test the reaction of protein fats and carbohydrate in bread, milk and egg.

Post Graduate Diploma in Nutrition and Dietetics
(Semester-I)

(Session: 2024-2025)

COMMUNITY NUTRITION AND SOCIAL WELFARE
(Practical)
COURSE CODE: PNDP-1285

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To understand the planning and conducting nutrition education programmes.
CO2. To develop the knowledge about standardization of cheap nutritious recipes using food suitable for vulnerable groups.
CO3. To enable them to conduct survey regarding vulnerable groups.
CO4. To understand the preparation of teaching aids for imparting nutrition education programmes.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-I)

(Session: 2024-2025)

COMMUNITY NUTRITION AND SOCIAL WELFARE

(Practical)

COURSE CODE: PNDP-1285

Time:3 Hours **Max. Marks: 50**

L-T-P **Practical: 35**

0-0-2 **CA: 15**

Contents:

1. Planning and conducting nutrition education programmes (Project).
2. Evolving and standardization of cheap, nutrition recipes using various food suitable for vulnerable groups.
3. Surveys (class project).
4. Preparation and use of projected and non-projected teaching aids for imparting nutrition Education programmes.

Books Recommended:

1. Biology of Nutrition – Elements 1972, Plenium Press.
2. Applied Nutrition – Rajalakshmi R.
3. Nutrition in India – Patwardha V.N.
4. Nutrition and physical fitness – Bougert L.J.
5. Nutrition evaluation of food processing, Roberts Haris, John Wiley and Sons, New Yorkand London.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-I)

(Session: 2024-2025)

INSTITUTIONAL FOOD ADMINISTRATION

(Practical)

COURSE CODE: PNDP-1286

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To gain knowledge about preparation of recipes suitable for a cafeteria.
CO2. To develop the knowledge about standardization and cost calculations of recipes selected for cafeterias
CO3. To enable them to display the various dishes.
CO4. To enhance the supervising quality of students in which they have to plan the cafeterias and calculate the cost involved in the preparation of the dish.

Post Graduate Diploma in Nutrition and Dietetics (Semester-I)

(Session: 2024-2025)

INSTITUTIONAL FOOD ADMINISTRATION

(Practical)

COURSE CODE: PNDP-1286

Time:3 Hrs. **Marks:50**

L-T-P **Practical:35**

0-0-2 **CA:15**

Contents:

i. Preparation of recipes suitable for Cafeteria.
ii. Standardization and Cost calculation of recipes selected for Cafeteria.
iii. Each student will run a Cafeteria and perform assigned duty in each cafeteria that will be evaluated. Manager will submit a report of each cafeteria.

Note: There will be no external exam. Each cafeteria and duties performed by students and reports submitted by them to the teacher will carry marks and the marks will be sent by concerned teacher.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-I)

(Session: 2024-2025)

BASIC NUTRITION

COURSE CODE: PNDL-1287

COURSE OUTCOMES

CO (1) – To develop the knowledge about introduction to nutrition and storage methods of cereals, pulses, eggs, poultry, vegetables and fruit.

CO (2) – To distinguish between the different types of cooking methods- dry heat, moist heat, frying and microwave cooking.

CO (3) – To understand the knowledge about classification, functions and food sources, requirement, deficiencies of carbohydrates.

CO (4) – To develop the knowledge about classification. Food sources, functions and deficiencies of proteins, fats and oils.

CO (5) – To understand the knowledge about energy, food as a source of energy, the body need of energy.

Post Graduate Diploma in Nutrition and Dietetics (Semester-I)

(Session: 2024-2025)

BASIC NUTRITION

CODE: PNDL-1287

Time:3 Hrs. **Marks: 50**

Instructions for the Paper Setter:

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section.
- Each question carry 10 marks.

Contents

Unit I

Introduction to nutrition- Food as a sources of nutrients, functions of food, definition of nutrition, nutrients , adequate, optimum and good nutrition, malnutrition.

Brief introduction of food commodities, their types, selection.

Storage & Use: - cereals & pulses, eggs fish poultry, vegetable & fruit sugar, & mild, oil & ghee, spice & condiments.

Unit II

Food Preparation

Basic terminology used in Cooking.

Different methods of cooking - Dry heat, moist heat, frying and microwave cooking.

Effect of cooking on nutritive value of food.

Unit III

Carbohydrates - Composition, classification, functions, food sources, requirement, deficiencies.

Fats and Oils- Composition, Classification, Saturated, Unsaturated fatty acids, food sources, functions, requirement and deficiencies.

Protein - Composition, Classification, Essential and Non- essential amino acids, food Sources, functions, deficiencies.

Unit IV

Energy- Unit of energy, food as a source of energy, energy value of food. The body need of energy.

Factors affecting energy requirement

1. Determination of energy value of foods using calorimeter
2. Specific Dynamic action
3. Basal Metabolism
4. Determination of basal metabolism
5. Factors affecting the BMR

References:

1. Guthrie, Hele, Andrews, Intoductory Nutrition, 6th ed. St. Louts, Times Mirror/MosbyCollege:1988.
2. Mudambi S.R. M.V. Rajgopal. Fundamental of Foods & Nutrition (2nd ed.) Wilay Eastern Ltd. 1990.
3. Swaminathan S: Advanced text book on foods Nutrition, Vol. I, II (2nd ed. Revised &enlarged) B. appC-1985.
4. Willson, EVAD Principles of Nutrition 4thed New York John Willey & Sons.1979

KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF ONE YEAR DIPLOMA PROGRAMME
Programme: Post Graduate Diploma in Nutrition and Dietetics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Semester-II										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
PNDL- 2281	Hygiene and Food Microbiology	C	3-0-0	3-0-0	3	100	70	-	30	3
PNDL-2282	Diet Therapy and Applied Nutrition	C	3-0-0	3-0-0	3	100	70	-	30	3
PNDL - 2283	Nutritional Science	C	3-0-0	3-0-0	3	100	70	-	30	3
PNDM-2284	Principles of Food Science	C	2-0-4	2-0-2	4	100	50	20	30	3+3
PNDP- 2285	Diet Therapy and Applied Nutrition (Practical)	C	0-0-4	0-0-2	2	50	-	35	15	3
PNDP –2286	Entrepreneurship And Diet Counselling	C	0-0-4	0-0-2	2	50	-	35	15	3
PNDI-2287	Internship and Report Writing	C	3 Months	0-0-8	8	100	-	100	-	-
PNDM-2288	Meal Management	D				100	60	40	-	3+3
TOTAL CREDITS					25	**600**				

C- Compulsory Course
D- Deficient Paper

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Hygiene and Food Microbiology
COURSE CODE: PNDL-2281

COURSE OUTCOME
Upon Completion of this Course the student should be able to

CO1. To knowledge about brief introduction to industrial hygiene, sanitation, public health, types of disinfection and different surfaces and materials.

CO2. To knowledge about brief history of microbiology and sub discipline of microbiology.

CO3. To develop the knowledge about harmful bacteria, methods of transmission and anti microbiology agents : antibiotics, germicides.

CO4. To understand the knowledge about types of food spoilage, food preservation, food additives and food packaging.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-II) (Session: 2024-2025)

Hygiene and Food Microbiology

COURSE CODE: PNDL-2281

Time:3 Hrs. **Max. Marks:100**
4Hrs/Week **Theory:70**
L-T-P **CA: 30**
3-0-0

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section. Each question carries 14 marks.

UNIT-I

1. **Hygiene:** A brief introduction to industrial hygiene, environment, sanitation and public health.
2. Hygiene
   a) Personal hygiene
   b) Procedure of hand hygiene
   c) Food hygiene (purchasing, preparation ,cooking and serving).
3. Control of infection in catering establishment.
   (a) Immunity types and their effect.
   (b) Disinfecting types of disinfection – Concurrent and terminal : methods of disinfection and different surfaces and materials – floor, walls, utensils, crockery, cutlery, clothing, wedding rooms, water closets, physical, chemical and mechanical methods.

UNIT-II

Microbiology:

1. Discovery and brief history of microbiology, sub disciplines of microbiology.
2. Ant microbiology Agents: Antibiotics, germicides, antiseptics, qualification of antimicrobial action.
3. Food hazard of microbial origin and occurrence and growth of micro organism in food

UNIT-III

4. Sources of harmful bacteria and their methods of transmission.
   (a) Bacterial food poisoning characteristics of bacteria, sources of infection in susceptible, food, sign and symptoms of the following:-Salmonella FP, Staphylococcal FP, Clostridium perfringes FP, Clostridium botulinum FP
   (b) Micro-organisms used in food biotechnology. Prebiotics and Probiotics.
5. Food contaminants: - naturally occurring toxicants, environmental contaminants and miscellaneous contaminants.

UNIT-IV

6. General types of food spoilage and food preservation according to following food groups:-
   - Cereal And Pulses
   - Milk And Meat Products
   - Fruits And Vegetables
7. (a)Food additives: classification , functional role and safety issues
   (c) Food packaging , concepts significance and functions , classification of packaging material and packaging methods.

References:

- Food Microbiology – William c .Frazier
  Microbiology –pelzar.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Diet Therapy and Applied Nutrition
COURSE CODE: PNDL- 2282

COURSE OUTCOME

Upon Completion of this Course the student should be able to

CO1. To develop the knowledge about the principles of therapeutic diets, drug nutrient interaction, diet in fevers, under and over nutrition.

CO2.To understand the nutrition in gastro- intestinal disorders, liver, gallbladder and pancreatic diseases.

CO3. To gain knowledge about dietary management in kidney diseases, organ transplant, cardiovascular diseases, and allergies.

CO4. To gain knowledge about diabetes, it's dietary management, cancer and it's dietary management, AIDS and it's nutritional management, skin diseases and role of diet in its management, PCOS and its nutritional management.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-II) (Session:

2024-2025)

Diet Therapy and Applied Nutrition
COURSE CODE: PNDL- 2282
(Theory)

Time:3 Hrs. **Max. Marks:100**
L-T-P **Theory: 70**
3-0-0 **CA: 30**

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section**.** Each question carries 14 marks.

UNIT -I

Drug – Nutrient interaction.

1. Principles of therapeutic diets.
   (a) Introduction – Intravenous feeding, soft, liquid and post operative feedings. Modifications of Diet. Surgical conditions.
   (b) Diets in Fever and Infections–Types, metabolism in fevers, general dietary considerations. Diet in Typhoid, Tuberculosis
   (c) Calories – Under nutrition, over nutrition.

UNIT-II

Gastro intestinal diseases – Peptic ulcer spastic and atonic constipation, diarrhea, Ulcerative colitis–symptoms and dietary treatment, Sprue-coeliac diseases, Lactose intolerance dietary treatment and Crohn disease.
Liver disease – jaundice, cirrhosis and hepatic coma, gall bladder disease (cholecystitis and cholelithiasis, and pancreatitis)
Chronic disorder like gout.

UNIT-III

Kidney disease – Nephritis, nephrotic syndrome acute and chronic renal failure, Urinary calculi kidney failure and Diet for Dialysis and non dialysis patient. Nutritional requirement during ESRD, Renal transplant.
Organ transplant

Cardiovascular disease – Hypertension and heart disease (Artherosclerosis, Hyperlipidemia)
Elimination diets in allergy.

UNIT-IV

Introduction to Diabetes: Definition of diabetes, Types of diabetes –Type 1, Type II, Prediabetes, Gestational Diabetes. Risk factors for diabetes: primary and secondary risk factors
Causes and symptoms of diabetes Insulin and its Types.
Treatment plan for diabetes patient
Nutrition in Cancer.
Nutrition in AIDS
Nutrition and skin diseases.
PCOS and its dietary management

References:

(i) Davidson and Passmor – Human Nutrition and Dietetics.
(ii) Whole and Good Heart – Modern Nutrition in Health and Disease.
(iii) Cooper, Barber and Micholl – Nutrition in health and disease.
(iv) Anita – Nutrition in health and disease.

Post Graduate Diploma in Nutrition and Dietetics
(Semester-II) (Session: 2024-2025)

Nutritional Science

COURSE CODE: PNDL- 2283

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To gain knowledge about nutritional science, RDA and science behind carbohydrates, lipids and dietary fibers.

CO2. To understand the concept about energy balance, proteins, calcium, phosphorus and iron.

CO3. To gain the knowledge about role, functions digestion absorption and utilization of iodine, copper, zinc, fluorine and fat soluble vitamins.

CO4. To understand the role of water and anti oxidants in human body.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Nutritional Science
COURSE CODE: PNDL- 2283

Time:3 Hrs. **Max. Marks:100**
L-T-P **Theory: 70**
3-0-0 **CA: 30**

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section**.** Each question carries 14 marks.

CONTENTS:

Unit I

1. Introduction ofNutrition Science
2. RDA: Factor Effecting RDA, Determination of RDA of Different Nutrients , General Principal Of Driving RDA , Requirement Of RDA, References Men And women, Indian standards of height and weight.
3. CHO : Classifications , function , digestion , absorption , glycemic index , metabolism , maintenance of blood glucose levels , rapidly available glucose values, RDA,sources.
4. Components of dietary fiber, physiological and metabolic effect, role of fiber in prevention of disease ,RDA, sources , understanding nutritional labeling of fiber
5. Lipids :classification , chemical composition fats in the body fats in the foods , functions, digestion and absorption , transport and metabolism , essential fatty acid , RDA,sources , dietary fats and coronary heart disease

Unit II

6. Energy balance : units , direct and indirect calorimeter extermination of energy value of foods , total energy requirement , measuring total energy requirement , resting energy expenditure , factor effecting physical activity , factor effecting basal metabolic rate , factor effecting thermic effect of food , RDA sources
7. Protein : chemical composition , properties, classification of proteins ,nutritional classification of amino acids, functions digestion and absorption , metabolism , quality of proteins , protein digestibility corrected amino acid score , complementary value of proteins, requirements , RDA sources
8. Microminerals;
   Calcium functions absorptions metabolism ,osteoporoses , reproductive status, hypocalcaemia, pre menstrual syndrome , high blood pressure colon cancer hypercalemia , RDA , sources , phosphorous , function , adsorption and metabolism and deficiency , RDA , calcium phosphorus ration, sources , magnesium , summery of some macro mineral
9. Micromineral

Iron distribution functions absorption and metabolism factors effecting absorption of non - hyme iron overload requirement, RDA , sources , nutritional anemia prevalence , iron deficiency anemia bio nutrition

Unit III

10. Iodine functions absorption and metabolism , RDA , sources , iodine deficiency disease, incidence , etiology , the spectrum of iodine deficiency disorder, etiology.
11. Copper, fluorine , zinc and chromium
12. Fat soluble vitamin : functions, conversion factors , absorption , transport and metabolism , carotene , RDA, sources
13. Vitamin – A deficiency disorders: epidemiology, etiology, level of vitamin A status, clinical features, evaluation of vitamin a status, treatment and prevention.
14. Fat soluble vitamin – E, D, and K : deficiency

Unit IV

15. Water soluble vitamin : thiamine, riboflavin and niacin , pharmacological usesof thiamine , drug induced pellagra
16. Water soluble vitamin : folic acid and vitamin b 12 , megaloblastic anemia and folic acid andb 12 deficiency , prevention of anemia
17. Water soluble vitamin : vit B6, pentatonic acid, biotin and vitamins c , role of b vitamin in energy metabolism , vit C and disease , vitamin like substance
18. Water and electrolyte balance : distribution of water and electrolyte , functions , requirement , sources water balance , electrolyte balance , water depletion , water excess, edema , requirement of salt.
19. Antioxidants : sources of free radicals and reactive oxygen and species , disease processby free radicals and reactive oxygen species , antioxidants defense system , antioxidant and disease , requirement and sources.

References:

- Textbook of nutritional Science, IGNOU
- Nutrition Science, B. SriLakshmi
- Food and Nutritional Science, PoojaVerma
- Food and Nutrition, Dr. MSwaminathan

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)

PRINCIPLES OF FOOD SCIENCE

COURSE CODE: PNDM- 2284

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To knowledge about principles of food science.

CO2. To develop the knowledge about starchy food, flours, fats and oils.

CO3. To develop the knowledge about meat structure, egg, milk and milk products.

CO4. To develop the knowledge about pulses, legumes, fruits and vegetables.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-II) (Session: 2024-2025)

Principles of Food Science
Course Code: PNDM- 2284

Time:3 Hrs. **Max. Marks:100**
L-T-P **Theory:50**
2-0-2 **Practical:20**
CA: 30

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section**.** Each question carries 10 marks.

CONTENT:

Unit I

Relation of cookery to colloidal chemistry
Definition of colloidal system, hydrophobic and hydrophilic colloids, stabilization of colloidal properties, surface tension, adsorption, foam formation, Rheology gel formation and emulsion
Methods of cooking and effect of cooking and processing on digestibility and nutritive value of foods Sugar cookery- sources, uses and properties crystallization of sugar, caramelization.

Unit II

Starchy cookery –sources and uses of starch, gelatinization
Flours - composition and baking qualities, batters and dough, leavening agents. Cooking and parboiling of rice
Fats and oils; - sources and extraction of edible oils and fats, changes in fats during storage and cooking, uses of fats.

Unit III

Meat structure, constituents of meat, post mortem changes, methods of cooking and changes in meat during cooking, tenderness, and juiciness
Egg; - structure, composition and selection coagulation of egg protein, eggs cooked in shells and parched eggs.
Milk and milk products; - composition and constituents of milk, coagulation of milk protein, curd cream, butter and cheese

Unit IV

Pulses and legumes, composition, method of processing and cooking, effect of processing such as, roasting, parching, soaking, germination and fermentation
Fruits and vegetables ;- structure , texture, pigments and acid and fruits and vegetables, browning reactions , pectin's substances theory of pectin gel formation, testing of pectin factors effecting gel formation

References:

- Food Science, B.Srilakshmi
- Food Science, Sumati R. Mudambi, Shalini M.Rao
- Food Microbiology, William C. Frazier

Post Graduate Diploma in Nutrition and Dietetics

(Semester-II)

(Session: 2024-2025)

Principles of Food Science

(Practical)

COURSE CODE: PNDM- 2284

COURSE OUTCOME

Upon Completion of this Course the student should be able to

CO1. To knowledge about evaluation of food grains.

CO2. To develop the knowledge about chemistry of cereals.

CO3. To develop the knowledge about chemistry of colloidal particles.

CO4. To develop the knowledge about food colours, preservation of food and new product development.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-II) (Session: 2024-2025)

Principles of Food Science

(Practical)

COURSE CODE: PNDM- 2284

Time:3 Hrs. **Max. Marks:20**

Contents:

- Evaluation of Food grains for their physical appearance
- Experiment on the chemistry of cereals
- Evaluation of milk samples
- Chemistry of colloidal particles
- Food colors
- Preservation of food
- Honey, fats and oil
- New product development.

Post Graduate Diploma in Nutrition and Dietetics
Semester II

(Session: 2024-2025)
Diet Therapy and Applied Nutrition
(Practical)
Course Code:PNDP-2285

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To develop the knowledge about planning, preparation and serving diets for all the conditions.
CO2. To understand the functioning of hospital in patient care and planning diets for different patients.
CO3. To learn the concept of preparing innovative recipes for therapeutic conditions.
CO4. To carry out survey on different diseases and prepare a survey report.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Diet Therapy and Applied Nutrition (Practical)
Course Code: PNDP-2285

Time:3 Hrs **Marks:50**
L-T-P **Practical: 35**
0-0-2 **CA: 15**

1. As related to theory planning preparation and serving diets for all the conditions mentioned in the theory keeping in mind the economic, regional and cultural factors. Family nutrition counseling.
2. Students are required to undergo 3 months training in a multispecialty hospital certificate tobe obtained from the hospital.
3. Innovation of at least 2 recipes for therapeutic conditions e.g. diabetes, hypertension etc.
4. Based on diet therapy theory, survey to be conducted on patients. Survey report has to be presented.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)

Entrepreneurship and Diet Counseling (Practical)
Course Code: PNDP-2286

COURSE OUTCOMES

Upon Completion of this Course the student should be able to

CO1. To understand the concept of diet counseling and functioning of a diet clinic.
CO2. To gain knowledge about nutrient calculating software and its application in practice.
CO3. To develop knowledge about case presentation.
CO4. To learn about recent advances in the fields of nutrition and case presentation.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Entrepreneurship and Diet Counseling (Practical)
Course Code: PNDP-2286

Time:3 Hrs. **Max. Marks:50**
L-T-P **Practical: 35**
0-0-2 **CA: 15**

- Operation of diet clinic and diet counseling
- Computer application in use of nutrition related to software:
- Diet cal
- Online software
- Report and presentations of case study
- Seminars will be based on the topics covering recent advances in the field ofnutrition, community nutrition, Public health and allied areas
- Reports on visits to food industry.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)

Internship and Report Writing

Course Code: PNDI -2287

Time:3 Hrs. **Max. Marks:100**

L-T-P
0-0-8

- Internship of any of the multi-specialty Hospital for a minimum period of 3 months in Dietetics Department.
- Prepare a report file based on the Internship.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)

Meal Management

(Theory)

Course Code: PNDM: 2288

COURSE OUTCOME:-

CO (1): To understand the concept of recommended dietary allowances, food groups, exchange list and balanced diet.

CO (2): To discuss principal of meal planning and nutritional requirements of men and women with different conditions

CO (3): To get the insight of the concept growth and development of preschooler, school going children and adolescent boys and girls.

CO (4): To understand the nutritional requirement during infancy.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Meal Management
Course Code: PNDM -2288

Time:3 Hrs. **Max. Marks:100**
Theory: 60
Practical:40

Instructions for the Paper Setter

- Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section.
- The fifth question may be attempted from any Section**.** Each question carries 12 marks.

Content:

Unit-I

Balanced diet: Concept of Balanced Diet, Food Groups, Exchange Lists, Definition and Objectives of RDA, RDA for different age groups. (ICMR). Calorie consumption units in planning meals for a family.

Unit-II

Meal planning: Introduction and Principles of Meal planning.

Unit-III

1. Physiological changes and nutritional requirement during pregnancy and lactation.
2. Growth & development and nutritional requirement during infancy breast feeding /vs bottle feeding and weaning.

Unit IV

3. Growth development, food habits and nutritional requirement of preschoolers, schoolgoing children & adolescent boy and girl.
4. Nutritional requirement for adult male & female, Sedentary, moderate & heavy worker.
5. Physiological changes during old age and meeting their nutritional requirements.

References:

1. Guthrie, Hele, Andrews, Introductory Nutrition, 6th Ed, St. Louts, Times Mirror/Mosby College:1988
2. Mudambi S.R. M.V. Rajgopal. Fundamental of Foods & Nutrition (2nd Ed.) Wilay Eastern Ltd. 1990.
3. Swaminathan S: Advanced Text Book on Foods Nutrition, Vol. I, II (2nd ed. Revised & enlarged) B. app C-1985 4. Willson, EVAD Principles of Nutrition 4th Ed, New York John Willey & Sons.1979.

Post Graduate Diploma in Nutrition and Dietetics (Semester-II)

(Session: 2024-2025)
Meal Management (Practical)

Course Code: PNDM -2288

COURSE OUTCOME:

CO (1): To understand the concept of Standardize Proportion Size.
CO (2): To discuss meal planning and nutritional requirements of men and women with different conditions
CO (3): To get the insight of the concept growth and development of preschooler, school going children and adolescent boys and girls.
CO (4): To understand the nutritional requirement during infancy with their Calculations.

Post Graduate Diploma in Nutrition and Dietetics

(Semester-II) (Session: 2024-2025)

Meal Management

Course Code: PNDM -2288

Time:3 Hrs. **Practical:40**

Note:

- Paper will be set on the spot by the examiner
- Planning of diet
- Cooking of 2 dishes from the diet plan
- Viva
- Files

1. Cook following dishes for different meals. Standardize portion size and calculate their nutritive value.

- Breakfast dishes- Stuffed Paranthas, Pancakes, Poha, Dalia etc.
- Lunch & Dinner dishes- Main Dishes- Dal, Channa, Rajmah, Koftas etc., Rice- Pulao, Paneer dishes, Side dishes, Dry. Vegetables, Stuffed Vegetables etc. Dessert - Puddings, Kheer etc. Salads, Soups etc.
- Evening Sweet & Salty snacks - at least 5each.

2. Plan balanced diet for the following age groups calculating calories, protein, one important vitamin and mineral as per requirement for the given age group.

(a) Infancy-Weaning foods

(b) pre-schooler

(c) school going child.

(d) adolescent girl and boy

(e) adult male and female(sedentary moderate and heavy worker)

(f) Pregnant and lactating Women

(g) Geriatric