

# **FACULTY OF Food Science & Technology**

**SYLLABUS FOR THE BATCH FROM THE YEAR 2022 TO YEAR 2023**

**Programme Code: DIND**

**Programme Name: Diploma in Nutrition and Dietetics  
(Semester I- II)**

**Examinations: 2022-2023**



**Department of Food Science and Technology**

**Khalsa College, Amritsar**

- Note:** (a) Copy rights are reserved. Nobody is allowed to print it in any form.  
 (b) Subject to change in the syllabi at any time.  
 (c) Please visit the College website time to time.

<b>S.No.</b>	<b>PROGRAMME OBJECTIVES</b>
1.	To understand about the scientific aspects of food; their classification, structure, composition, processing methods and nutritive value.
2.	To apply knowledge of nutrition and dietetics to create diet plans, manage chronic diseases. They will also be able to maintain and preserve the nutritional value of foods.
3.	To apply the principles of nutrition and dietetics to identify and analyze complex problems related to food supplementation and fortification.
4.	To utilize the gained knowledge in hospitals for managing diets and nutrition of patients.
5.	To give detailed information related to national programmes, supplementary feeding programmes, National deficiency control programmes, Programmes for communicable diseases.

<b>S.No.</b>	<b>PROGRAMME SPECIFIC OUTCOMES (PSOS)</b>
PSO-1	To equip students with the knowledge of various food components and nutritional value of food groups so that they are able to create diet plans for all groups of persons.
PSO-2	To make students understand the role of nutrition and dietetics and entrepreneurship techniques along with the environmental challenges in daily and professional life.
PSO-3	To enhance the capability of students to identify, analyze and solve to problem arising in food industries related to nutrition in the process of preparation & preservation of foods.
PSO-4	To strengthen the foundation of students to build up their career as nutritionist or dietician to pursue career in food as well as interdisciplinary areas or to establish their entrepreneurship ventures.
PSO-5	To help students focus on the importance of dietary management in day to day life

**COURSE SCHEME****SEMESTER - I**

Course Code	Course Name	Hours/Week	Max. Marks				Page No.
			Th	Pr	IA	Total	
DIND11-101	Basic Nutrition	6	50	25	25	100	04
DIND11-102	Food Science	6	50	25	25	100	06
DIND11-103	Anatomy and Physiology - I	3	37	-	13	50	08
DIND11-104	Dietetics	6	50	25	25	100	09
DIND11-105	Seminar I	2	-	25	---	25	10

**SEMESTER – II**

Course Code	Course Name	Hours/Week	Max. Marks				Page No.
			Th	Pr	IA	Total	
DIND12- 201	Community Nutrition	6	50	25	25	100	11
DIND12- 202	Therapeutic Nutrition	6	50	25	25	100	12
DIND12- 203	Anatomy and Physiology- II	3	37	-	13	50	13
DIND12- 204	Food Hygiene and Microbiology	6	50	25	25	100	14
DIND12- 205	Diet Counselling and Computer operations	2	-	25	---	25	16

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)**  
**COURSE CODE: DIND11- 101**  
**COURSE TITLE: BASIC NUTRITION**

**CREDIT HOURS (per week): 06**  
**(T=3, P=3 TOTAL=6)**  
**TOTAL HOURS:90**  
**Time: 3 Hours**

**Maximum Marks:100**  
**Theory Marks-50**  
**Practical Marks-25**  
**Internal assessment-25**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- To provide detailed knowledge about the relation between food and nutrition.
- To provide practical knowledge of modified recipes in terms of- Low protein, High protein, Low fat, Low sodium, Calcium rich, Iron rich, Rich in vitamin A.
- To provide detailed knowledge about functions, metabolism, classification, RDA values and nutritive value of macro and micronutrients.
- To furnish information about vitamins and minerals

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

**Introduction to nutrition** – Scope of nutrition.

**Carbohydrates**- Classification, functions of carbohydrates, metabolism of carbohydrates.

**Proteins and Amino acids**- Classification , functions of proteins, daily protein requirement , factors affecting protein requirement, effect of protein excess and deficiency, Metabolism of proteins and amino acids.

**Lipids**- Classification, functions of fats and oil, metabolism of fats and lipids.

**UNIT 2**

Nutritive component of food water.

Energy metabolism- Basal metabolic rate, Resting metabolic rate, factors affecting BMR.

Phytochemicals

**UNIT 3**

**Vitamins-**

Fat soluble vitamins-A,D,E,K.Water soluble vitamins- B complex, vitamin C

**Minerals-**

Macrominerals – Calcium, phosphorus, magnesiumMicrominerals- Iron, Iodine, Zinc, Copper

**PRACTICAL:**

1. Preparation of modified recipes in terms of-
2. Low protein, High protein, Low fat, Low sodium, Calcium rich, Iron rich, Rich in vitamin A

**BOOKSPRESCRIBED:**

1. Food nutrition: M. swaminathanVol I and Vol II.
2. Textbook of Nutiriton and dietetics : Khanna, Gupta, Passi and Mahna
3. Nutrition and Dietetics: Joshi SA 2011 (Tata Mc Graw Hill).

**COURSE OUTCOMES:**

Student will know about various components of food, their classification, functions and metabolism. They will be aware of various metabolic processes and also able to calculate their own metabolic rates as per their physical activity.

**(Signature)**

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)**

**COURSE CODE: DIND11- 102**

**COURSE TITLE:FOOD SCIENCE**

**CREDIT HOURS (per week): 06**

**(T=3, P=3 TOTAL=6)**

**TOTAL HOURS:90**

**Time: 3 Hours**

**Maximum Marks:100**

**Theory Marks-50**

**Practical Marks-25**

**Internal assessment-25**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- To understand about the scientific aspects of food; their classification, structure, composition, processing methods and nutritive value.
- To familiarize students with composition and nutritive value of fruits and vegetables.
- To access the egg quality and structures, functions and classification cereal grains, pulses, oilseeds and protein rich foods.
- To introduce the students to the general principles regarding food processing, preservation and nutrition improving techniques.

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

Introduction to food science- classification of foods.

Cereal grains and products - structure of cereal grain, cereal cookery.

Vegetables and fruits – composition and nutritive value.

Oils and fats in food

**UNIT 2**

Pulses – Toxic constituents in pulses , processing.

Milk – composition, processing.

Meat ,Poultry, Fish

Egg- Nutritive value, evaluation of egg quality.

**UNIT 3**

Food preservation – principles of food preservation, methods of food preservation.

Methods of improving nutritional quality of foods- germination, fermentation, fortification, supplementation.

Food adulteration

**PRACTICAL:**

Preparation of food by different methods-

Germination

Fermentation Baking Frying

**BOOKS PRESCRIBED:**

Food Science: Potter NN.

Food facts and Principals: Manary N.

**COURSE OUTCOMES:**

This subject will help students to understand about the scientific aspects of food; their classification, structure, composition, processing methods and nutritive value. This subject will also enlighten students about different methods of improving nutritional quality of food and they will be able to understand food preservation techniques. Students will also be aware about food adulteration and their detection methods.

**(Signature)**

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)**  
**COURSE CODE: DIND11- 103**

**COURSE TITLE: ANATOMY AND PHYSIOLOGY-I**

**CREDIT HOURS (per week): 03**

**Maximum Marks:50**

**Theory =3**

**Theory Marks-37**

**TOTAL HOURS:45**

**Internalassessment-13**

**Time: 3 Hours**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**COURSE OBJECTIVES:**

- To describe the structure and functions of digestive system and mechanism of digestion and absorption processes.
- To provide detailed information on the cells and cell structures.
- To explain the structure and functions of integumentary system, skeletal system and muscular system.
- To provide brief knowledge about the diseases associated with the excretory system.

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

Introduction to living beings

The cell

Digestive system – structure, functions of salivary glands, stomach, pancreas, liver and the intestine.  
Mechanism of digestion and adsorption of carbohydrates, proteins and fats.

Role of enzymes in digestion of carbohydrates, proteins and fats.

**UNIT 2**

Excretory system – Structure and function of kidney, mechanism of urine formation, disorders indicated by abnormal constituents of urine.

Musculoskeletal system – Types of bones , muscles.

Integumentary system – The skin and its functions , different layers of the skin, abnormalities of the skin.

**BOOKS PRESCRIBED:**

- Human physiology Vol I and Vol II- Chatterjee CC.
- Concise medical physiology- Chaudhary SK.
- BD chaurasia- handbook of general anatomy 5th edition CBS publication.

**COURSE OUTCOMES:**

Students will be able to define basic anatomical and physiological terms, structure and functions of cells and tissues. They will be able to explain the concept of excretory system and their disorders and further able to understand the musculoskeletal and integumentary system.

**(Signature)**



**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)**

**COURSE CODE: DIND11- 104**

**COURSE TITLE:DIETETICS**

**CREDIT HOURS (per week): 06**

**(T=3, P=3 TOTAL=6)**

**TOTAL HOURS:90**

**Time: 3 Hours**

**Maximum Marks:100**

**Theory Marks-50**

**Practical Marks-25**

**Internal assessment-25**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- Provide comprehensive and essential practical guidance on all aspects of dietetics from the promotion of health to the management of diseases
- Provide knowledge about meal planning and portion size, food exchange list.
- Students will be able to collect data based on assessment of body or body composition analysis.
- Provides essential knowledge about nutrition for different age groups.

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

Introduction to dietetics

Fundamentals of meal planning

**UNIT 2**

Nutrition in life cycle -

Adulthood

Pregnancy

Lactation

Infancy

Childhood

Adolescence

Old age

**PRACTICAL:**

Make a diet plan for –

Adulthood

Pregnancy

Lactation

Infancy

Childhood

Adolescence

Old age

**BOOKS PRESCRIBED:**

- Textbook of nutrition and dietetics by Khanna S. GUPTA, Passi and Mahna.
- Textbook of nutrition and dietetics by Joshi SA, 2011

**COURSE OUTCOMES:**

This subject is concerned with diet and its effects on health. Students will be able to use food exchange list in the meal planning. They will be able to understand the role of diet at various life stages and can make diet plan accordingly.

(Signature)

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)**

**COURSE CODE: DIND11- 105**

**COURSE TITLE: SEMINAR -I**

**Credit Hours/Week: 2**

**Total Hours:30**

**Time : 3 Hours**

**Maximum Marks: 25**

**Practical: 25**

**Course Objectives:**

- To assist students in their academic field
- To assist students in understanding role of nutrition in different fields such as public health nutrition/community nutrition or medical fields
- To help the students in preparation of seminar based on related fields
- To enhance knowledge in the advancement of nutrition and wellness sector

Seminar will be based on topics taken from advances in the field of community nutrition, public health and allied areas.

**COURSE OUTCOMES:**

Students will be able to get to know about the advancement carried out in the field of community nutrition, public health and allied areas.

(Signature)

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)**

**COURSE CODE: DIND12- 201**

**COURSE TITLE: COMMUNITY NUTRITION**

**CREDIT HOURS (per week): 06**

**(T=3, P=3 TOTAL=6)**

**TOTAL HOURS:90**

**Time: 3 Hours**

**Maximum Marks:100**

**Theory Marks-50**

**Practical Marks-25**

**Internal assessment-25**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- Develop a knowledge base in key areas of nutrition/dietetics and food service management such as public health nutrition
- To give detailed information related to national programmes, supplementary feeding programmes, National deficiency control programmes, Programmes for communicable diseases.
- To train the students as a diet or nutrition/health counsellor.
- To give an exposure of primary health care centre

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

Concept of community nutrition

Aim , scope and concept of public health nutrition

Methods for assessment of nutritional status of community

**UNIT 2**

Approaches for nutrition education in community – scope and its importance.

Counselling skills

National and health programs – National programmes, supplementary feeding programmes , National deficiency control programmes , Programmes for communicable diseases.

Nutritional surveillance – Meaning, need, importance, objectives.

**PRACTICAL:**

Planning and preparation of low cost nutritious recipes.

Visit the primary health care centre.

**BOOKS PRESCRIBED:**

1. Jelliffy DB AND Jelliffy EFP. 1989- Community nutritional assessment. Oxford University press.
2. Wadhwa A and Sharma S. Nutrition in the community- A textbook, SSCN news UN ACC/ SCN subcommittee on nutrition.

**COURSE OUTCOMES:**

Students will develop an in-depth understanding of community nutrition and the role of dietitian in this area by examining community nutrition programs and program planning principles. Students will also get knowledge of counselling skills, nutritional approaches in community, national health programs, deficiency control programmes and nutritional surveillance.

(Signature)

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)**  
**COURSE CODE: DIND12- 202**  
**COURSE TITLE: THERAPEUTIC NUTRITION**

**CREDIT HOURS (per week): 06**

**(T=3, P=3 TOTAL=6)**

**TOTAL HOURS:90**

**Time: 3 Hours**

**Maximum Marks:100**

**Theory Marks-50**

**Practical Marks-25**

**Internal assessment-25**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- To provide knowledge about modification of normal diet
- To give detailed information on gastrointestinal and metabolic disorders.
- To give awareness regarding the cardiovascular, liver, febrile, musculoskeletal and renal disorders
- To inform the students about food allergies.

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

Therapeutic modification of normal diet

Gastrointestinal disorders – Gastritis , Hernia , Diarrhoea , constipation , peptic ulcers, ulcerative colitis , crohns disease , dumping syndrome.

Metabolic disorders – Diabetes, gout, hypothyroidism, hyperthyroidism, polycystic ovarian disorders.

**UNIT 2**

Cardiovascular disorders – Hypertension, Atherosclerosis, myocardial infarction.

Liver disorders- Jaundice, hepatitis, diseases of gall bladder.

Febrile disorders – Typhoid, tuberculosis

**UNIT 3**

Musculoskeletal disorders – Osteoarthritis, osteoporosis

Renal diseases – Glomerulonephritis, nephrotic syndrome, renal stones, acute and chronic renal failure.

Food allergies and food intolerance, Weight management

**PRACTICAL:**

1. Make a diet plan for a diabetic person
2. Make a diet plan for women with hyperthyroidism
3. Make a diet plan for a person with high cholesterol
4. Make a diet plan for a gout patient
5. Make a diet plan for hernia patient
6. Make a diet plan for a patient suffering from peptic ulcer.

**BOOKS PRESCRIBED:**

- Bamji MS, Rao NP and Reddy V (2003) textbook of human nutrition. Oxford and IBH.
- Swaminathan M (1974) Essentials of foods and Nutrition Vol. II ganesh.

**COURSE OUTCOMES:**

Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of individuals with medical conditions. This subject will help students to learn about principle of

therapeutic diets.

(Signature)

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)**  
**COURSE CODE: DIND12- 203**  
**COURSE TITLE: ANATOMY AND PHYSIOLOGY- II**

**CREDIT HOURS (per week): 03**

**Theory =3**

**TOTAL HOURS:45**

**Time: 3 Hours**

**Maximum Marks:50**

**Theory Marks-37**

**Internalassessment-13**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks.**

**Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**COURSE OBJECTIVES:**

- To explain the endocrine and lymphatic system of the human body.
- To explain cardiovascular system and diseases associated with it.
- To provide information about nervous system and its types.
- To explain the mechanism and structure of respiratory and reproductive system.

**COURSE CONTENTS:**

**THEORY**

**UNIT 1**

Endocrine system – Definition , functions, kinds of hormones.

Structure and functions of following glands – Thyroid , parathyroid , adrenal , pancreas, pituitary and pineal gland.

Cardiovascular system – composition of blood , ABO blood group . basic structure of heart , cardiac cycle . Blood pressure and factors affecting it.

Lymphatic system – Functions and life cycle of lymphocytes.

**UNIT 2**

Nervous system – structure and functions of nerve and receptor cells , transmission of nerve impulse , Autonomic nervous system – sympathetic and parasympathetic nervous system.

Respiratory system – structure of respiratory system , mechanism of respiration and its regulation.

Reproductive system – structure and function of male and female sex organs and glands, role of hormones in reproduction , placenta.

**BOOKS PRESCRIBED:**

1. Bamji MS, Rao NP and Reddy V (2003) textbook of human nutrition. Oxford and IBH.
2. Swaminathan M (1974) Essentials of foods and Nutrition Vol. II ganesh.

**COURSE OUTCOMES:**

Students will be able to apply the concept in medical field and have knowledge of cell structure, function, anatomy and physiology of organ system. Students will also be able to learn inter relation between different human organ system.

(Signature)

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)**  
**COURSE CODE: DIND12- 204**  
**COURSE TITLE: FOOD HYGIENE AND MICROBIOLOGY**

**CREDIT HOURS (per week): 06**  
**(T=3, P=3 TOTAL=6)**  
**TOTAL HOURS:90**  
**Time: 3 Hours**

**Maximum Marks:100**  
**Theory Marks-50**  
**Practical Marks-25**  
**Internal assessment-25**

**INSTRUCTIONS FOR THE PAPER SETTERS:**

**Theory: Question paper will be of eight questions in all. All questions will carry equal marks. Students are required to attempt five questions only.**

**Question no. 1 (Short answer type) will be compulsory.**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- To provide information about history of microbiology and importance of micro-organisms.
- To explain different food preservation techniques.
- To provide information regarding contamination and spoilage of food products.
- To describe the methods used for destruction of micro-organisms.

**COURSE CONTENTS:**  
**THEORY**

**UNIT 1**

Discovery and history of microbiology.

Introduction to important microorganisms in foods.

Physical and chemical methods used in destruction of microorganisms.

**UNIT 2**

Use of high or low temperature, dehydration, irradiation and preservatives in food preservation.

Contamination and spoilage of cereal and cereal products, vegetables and fruits, canned foods, meat and meat products, milk and milk products.

**PRACTICAL:**

- Study of compound microscope
- Study of autoclave and hot air oven
- Study of laminar flow and colony counter
- Preparation of nutrient broth and agar medium for growth of microorganism
- Study of pour plate, spread plate and streak plate method of isolation of microorganisms
- Study of different hygiene maintaining techniques in a food establishment

**BOOKS PRESCRIBED:**

- Principles of Food Sanitation by Marriott, 5<sup>th</sup> ed., 2006, CBS Publisher, New Delhi.
- Jay JM Modern Food Microbiology CBS publishers ND, 2005.
- Pawar and Daginawala- 2010 Gen Microbiology (Vol II).
- Food Microbiology by Frazier and westerner. 4th Edition Tata Mc Graw Hill.

**COURSE OUTCOMES:**

This subject will provide the key concepts and principles of food microbiology with special emphasis on the interaction between microorganisms and food. Students will be able to learn important microorganisms, different methods used for destruction of microorganism, preservation techniques.

**(Signature)**

**DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)**  
**COURSE CODE: DIND12- 205**  
**COURSE TITLE: DIET COUNSELLING AND COMPUTER OPERATIONS**

**Credit Hours/Week: 2**  
**Total Hours:30**  
**Time : 3 Hours**

**Maximum Marks: 25**  
**Practical: 25**

**Practical – Question Paper will be set with the mutual consent of Internal and External Examiners at the spot.**

**COURSE OBJECTIVES:**

- To give awareness regarding the organizational understanding of hospitals and wellness sector.
- To explain the application of nutrition care process.
- To help students to use the diet counselling form and to operate computer applications, diet calculations or nutrition related online software.
- To help students in preparing case study report and presentation and to impart necessary expertise to enable learners to function as dietitians, diet counsellors and nutrition and health communicators.

**COURSE CONTENTS:**

**PRACTICAL:**

- Operation of diet clinic and counseling.
- Computer applications in nutrition related software, online software and diet calculation.
- Case study report and presentation.
- Visit to any institution such as Anganwari/ hotel industry/ hospital/ department of any institution/ NGO/ and presentation report.

**COURSE OUTCOMES:**

Students will get knowledge about operations of diet clinic, computer applications, nutrition related software, diet calculations and diet counselling. Students will be able to make case study report and presentation. Students will be able to demonstrate a variety of communication strategies in nutrition and food education.

**(Signature)**