KHALSA COLLEGEAMRITSAR

(An Autonomous college)
Affiliated to Guru Nanak Dev University, Amritsar

SYLLABUS

DIPLOMA IN NUTRITION AND DIETETICS
SESSION: 2021-22

Post Graduate Department of Food Science and Technology

ELIGIBILITY: 10+2 PASS IN ANY STREAM

Programme Outcomes (PO)

PO1 Nutrition & Dietetics knowledge:-students will be able 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.

PO2 Problem Analysis:- Students will be able to apply the principles of nutrition and dietetics to identify and analyze complex problems related to food supplementation and fortification. They will also be able to apply knowledge in hospitals in managing diets and nutrition of patients.

PO3 Designing of solution:- To prepare students to design system components or process to meet the specific needs for public health and safety along with cultural societal and environmental considerations.

PO4 Investigation of Complex problems. To provide knowledge about how to use research methods and tools in order to analyze, interpret and compile the information for valid conclusion.

PO5 Modern Tool usage:-To prepare students to use modern tools for prediction, modeling and storage of data.

PO6 Nutrition and Dietetics & Society:-To become able to apply reasoning to solve social health, safety, cultural and legal issues.

PO7 Environment & sustainability:- To impart knowledge about sustainable clean environment for public health.

PO8 Ethics:- To prepare students for professional ethics and commitments as well as responsibilities for public health and safety.

PO9 Individual & Team work:- To make students to function effectively as an individual leader and as a team member.

PO10 communication:- To prepare students to communicate effectively in the written, spoken, presentation and to give and receive logical explanations of the problems.

PO11 Projects Management & financial:- To prepare students to manage multidisciplinary projects and manage finances for running the projects.

PO12 Life Long Learning:- To provide skill so that students are able to earn for a normal living.

Programme Specific Outcomes (PSO)

PSO1:-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.

PSO2:- To make students understand the role of nutrition and dietetics and entrepreneurship techniques along with the environmental challenges in daily and professional life.

PSO3: 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.

PSO4:- 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.

ORDINANCE FOR DIPLOMA IN NUTRITION AND DIETETICS

1. **Eligibility for Admission and duration of the courses**

ELIGIBILITY: 10+2 PASS IN ANY STREAM

2. Scheme of Instructions-Examination

For each examination, every student admitted to the courses under the semester system must be on the rolls of the institution, and has attended at least 75% of the total number of lectures delivered in each theory and practical course separately. Deficiency in lectures may be condoned as per Autonomous college rules. If in particular semester, a student falls short of attendance in a maximum of two courses, he/she would be permitted to appear in the semester examination of the papers in which he/she fulfils the attendance requirements. The course/s in which the student does not fulfill the minimum attendance requirements, he/she shall not be permitted to appear in the semester examination of such course/s, and shall be declared as having failed in such course/s. A student who is falling short of attendance in maximum two courses, he/she shall be required to attend the minimum number of lectures which were falling short, during next year when the course/s is/are offered.

a) Of having good moral character.

b) The syllabi, courses of reading and regulations for the courses shall be notified by the Autonomous college from time to time, and shall be deemed to constitute an integral part of ordinances. Course evaluation under the semester system of evaluation shall be done on marks basis. If a course has both the theory and practical components, the student will be required to pass both the components, separately. However, if the student fails in theory, but is passing in practical examination of that course, he/she will be required to clear the theory paper only, and vice-versa.

c) Carry on system for various semester examinations.

I. Courses having two semester duration:

a. There shall be no condition for promoting a student from first semester to second semester.

b. In case a student fails to pass all the courses/ papers within a period of two semesters (one year), he/she shall be given two semester (one year) more to pass.

c. ***Note 1:*** No special chance or exemption shall be allowed beyond what is stated in the above Ordinances.

Note 2: Failing students shall appear in the examination in the regular semester examinations next year i.e. reappear of examination for an odd semester shall be conducted along with the next odd semester, and even semester along with the next even semester and there shall be no special supplementary examinations.

e) The pass marks for a course (paper) shall be 35% at Diploma level.

f) The medium of instructions shall be English.

g) Grace marks will be allowed as per autonomous college rules.

h) Maximum time will be allowed to pass a course is given below

Course duration	Maximum time to complete a diploma
One year	Two years

i) The candidate shall be treated to be failing in the course offered in the semester in which he has not sought admission/dropped the semester and such course/papers in which the candidate has failed shall be taken into account while deciding the promotion of the candidate in subsequent semesters as per the condition. The candidate shall be required to seek admission into the second semester examination as a regular candidate at the end of the prescribed duration of the course, but within the maximum time allowed to pass a course as given under Para (h) of the ordinances, provided that he fulfills all other requirements under the prevailing ordinances.

3. Discipline

Each student shall be under the control and discipline of the concerned institution. In case of any misconduct on the part of a student, the institution shall have a power to take disciplinary action against the defaulter, to the extent of cancellation of admission of the defaulting student from the rolls of the institution.

4. Result-Division-Degree

The successful candidates shall be classified into the following divisions:

a) **First Division with distinction**-Those who obtain 75% or more marks at the end of their course.

b) **First Division**-Those who obtain 60% or more marks at the end of their course.

c) **Second Division**- Those who obtain 50% or more marks, but less than 60% marks at the end of their course.

d) **Third Division**- Those who obtain 40% or more marks, but less than 50% marks at the end of their course.

The successful candidate shall be awarded the diploma certificate in the subject of his/her study indicating the divisions obtained on the basis of the result of all the semester examinations. A student who does not complete the programme of study within the minimum duration of the course of his/her study, or fails in any course, shall not be eligible for any merit position/medal/award of the College/ University.

DIPLOMA IN FOOD NUTRITION AND DIETETICS

Study Scheme

Semester I

Sr. No	Subject code	Subject	Teaching Periods			Marks			
			T	P	Total	Theory	Practical	IntAsst	Total
1	DND 101	Basic Nutrition	3	3	6	50	25	25	100
2	DND 102	Food Science	3	3	6	50	25	25	100
3	DND 103	Anatomy and Physiology I	3			37	-	13	50
4	DND 104	Dietetics	3	3	6	50	25	25	100
5	DND 105	Seminar I		2	2		25	---	25
								Total	375

Semester II

Sr No		Subject	Teaching Periods			Marks			
			T	P	Total	Theory	Practical	IntAsst	Total
1	DND 201	Community Nutrition	3			50	25	25	100
2	DND 202	Therapeutic Nutrition	3	3	6	50	25	25	100
3	DND 203	Anatomy and Physiology II	3	3	6	37	-	13	50
4	DND 204	Food Hygiene and Microbiology	3	3	6	50	25	25	100
5	DND 205	Diet Counselling and Computer operations		2	2		25	---	25
								Total	375

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

DND 101 BASIC NUTRITION

Credit Hours/Week: 6
Total Hours:90
Maximum Martks:100

Theory-50
Practical-25
Int. Ass-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

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

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

Food nutrition: M. swaminathan Vol I and Vol II.
Textbook of Nutiriton and dietetics : Khanna, Gupta, Passi and Mahna
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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

DND -102 FOOD SCIENCE

Credit Hours/Week: 6
Total Hours:90
Maximum Martks:100

Theory-50
Practical-25
Int. Ass-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.

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-

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

DND-103 ANATOMY AND PHYSIOLOGY 1

Credit Hours/Week: 3
Total Hours:45
Maximum Martks:50

Theory-37
Int. Ass-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 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.

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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

DND-104 DIETETICS

Credit Hours/Week: 6
Total Hours:90
Maximum Martks:100

Theory-50
Practical-25
Int. Ass-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.

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

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER I)

DND-105 SEMINAR

Credit Hours/Week: 3
Total Hours:45
Maximum Martks: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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

DND-201 COMMUNITY NUTRITION

Credit Hours/Week: 6
Total Hours:90
Maximum Martks:100

Theory-50
Practical-25
Int. Ass-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

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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

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 approachesin community, national health programs, deficiency control programmes and nutritional surveillance.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

DND-202 THERAPEUTIC NUTRITION

Credit Hours/Week: 6
Total Hours:90
Maximum Martks:100

Theory-50
Practical-25
Int. Ass-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, musculoskeletaland renal disorders
- To inform the students about food allergies.

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.
Feblile 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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

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 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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

DND-203 ANATOMY AND PHYSIOLOGY II

Credit Hours/Week:3
Total Hours:45
Maximum Martks:50

Theory-37
Int. Ass-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.

UNIT 1

Endocrine system – Definition , functions, kinds of harmones.
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 harmones 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.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

DND-204 FOOD HYGINE AND MICROBIOLOGY

Credit Hours/Week: 6
Total Hours:90
Maximum Martks:100

Theory-50
Practical-25
Int. Ass-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.

UNIT 1

Discovery and history of microbiology.
Introduction to important micro organism in foods.
Physical and chemical methods used in destruction of micro organisms.

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

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

BOOKS PRESCRIBED-

1. Principles of Food Sanitation by Marriott, 5th ed., 2006, CBS Publisher, New Delhi.
2. Jay JM Modern Food Microbiology CBS publishers ND, 2005.
3. Pawar and Daginawala- 2010 Gen Microbiology (Vol II).
4. 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 theinteraction between microorganisms and food. Students will be able to learn important microorganisms, different methods used for destruction of microorganism, preservation techniques.

DIPLOMA IN NUTRITION AND DIETETICS (SEMESTER II)

DND-205 DIET COUNSELLING AND COMPUTER OPERATIONS

Credit Hours/Week: 3
Total Hours:45
Maximum Martks: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 dieticians, diet counsellors and nutrition and health communicators.

Practical

1. Operation of diet clinic and counseling.
2. Computer applications in nutrition related software, online software and diet calculation.
3. Case study report and presentation.
4. 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.