

UNIVERSITY OF NIGERIA, NSUKKA

FACULTY OF AGRICULTURE

DEPARTMENT OF NUTRITION AND DIETETICS

**POSTGRADUATE DIPLOMA (PGD), MASTERS OF SCIENCE (M.Sc) &
DOCTOR OF PHILOSOPHY (Ph.D) PROGRAMME**

IN

NUTRITION AND DIETETICS

LIST OF APPROVED SUPERVISORS

PROFESSORS

N.M. Nnam <i>B.Sc., M.Sc., Ph.D. (Nig)</i>	<i>Community and Pulic Health Nutrition</i>
E.K. Ngwu <i>B.Sc., M.Sc., Ph.D. (Nig)</i>	<i>Clinical Nutrition, Community Dietetics and Public Health</i>
E.A. Onyechi <i>B.Sc.(Pennsylvania),</i>	<i>Clinical Nutrition and Public Health</i>

M.Sc.(Ohio), Ph.D (London)

V.N. Ibeanu *B.Sc., M.Sc., Ph.D. (Nig)* *Infant and Public Health*

E.U. Madukwe *B.Sc., M.Sc., Ph.D. (Nig)* *Experimental and Public Health
Nutrition*

J.U. Nwamarah *B.Sc., M.Sc., Ph.D. (Nig)* *Experimental Nutrition, Nutritional
Toxicology, Improvemvt of Plants
Nutritional Quality, Public Health
and Community Nutrition*

READER

G.T.O. Otitoju *B.Sc. Ed. Biology (Zaria), Experimental Nutrition Nutritional
Toxicology, Improvemvt of Plants
Nutritional Quality and Public Health
M.Sc., Ph.D. (Nig)*

SENIOR LECTURERS

N.O. Onuoha *B.Sc., M.Sc., Ph.D. (Nig)* *Public health and Community
Nutrition*

U.S. Onoja *B.Sc., M.Sc., Ph.D. (Nig)* *Public Health/Community Nutrition*

J.N. Chikwendu *B.Sc., M.Sc., Ph.D. (Nig)* *Experimental and Public Health
Nutrition and Quality Food
Evaluation*

UNIVERSITY OF NIGERIA, NSUKKA

PGD, M.Sc AND Ph.D PROGRAMMES IN NUTRITION AND DIETETICS

PHILOSOPHY

The postgraduate diploma in Nutrition and Dietetics is to provide postgraduate training for Candidates with degree in Agriculture and Sciences or Higher National Diploma (HND) graduates in Nutrition and Dietetics wishing to convert to the professional cadre on completion of a master's degree in Human Nutrition. It is also designed for recent graduates of Nutrition and Dietetics who otherwise would not qualify for admission into Masters Degree programme in the Department. Therefore the programmes in Nutrition and Dietetics and related disciplines were designed to develop high level manpower to pursue careers in academics and research. It is to provide the highest degree of specialization in a particular field in the context of expanding knowledge globally and solving real life problems. The programme is to bridge the gap between food crop production and the utilization of agro-products as well as human and material resources to enhance quality of life. The Nutrition and Dietetics students are engaged in a broad multidisciplinary study bridging the gap between the areas of food science, applied medical science and management studies.

OBJECTIVES

A. The Postgraduate Diploma in Nutrition and Dietetics is aimed at:

- a. Producing persons with advanced knowledge and skills in Nutrition and Dietetics.
- b. Exposing non-nutrition professionals to knowledge, skills and practice in Nutrition and Dietetics.
- c. Provide training in specific aspects of Nutrition and Dietetics.

B. The Master of Science Degree in Nutrition and Dietetics Degree Programme is aimed at:

- a. Exposing students to advanced courses in relevant areas of Nutrition and Dietetics and other academic disciplines
- b. Equipping students with research skills through the conduct of supervised research, seminar presentations and thesis preparation

C. The Doctor of Philosophy (PhD) Degree Programme in Nutrition and Dietetics is aimed at:

- a. Equipping students with research skills through the conduct of supervised research, seminar presentations and thesis preparation.
- b. Providing training for those whose future careers lie in teaching and research at the tertiary level and in research and development in the public and private sector.

ADMISSION REQUIREMENTS

- A.** Candidates seeking admission for Postgraduate Diploma in Nutrition and Dietetics must have any of the following qualifications from recognized institutions:
 - a. Higher National Diploma in Nutrition and Dietetics with a minimum of upper Credit.
 - b. Third Class Bachelor's Degree in Nutrition and Dietetics or Agriculture.
 - c. Minimum of pass in Higher National Diploma plus ten (10) years cognate experience.
 - d. Minimum of pass degree with five (5) years cognate experience.
- B.** Candidates seeking admission for the Master of Science Degree programme in Nutrition and Dietetics must have any of the following qualifications from recognized institutions:
 - a. Bachelor's degree in Nutrition and Dietetics with a minimum of Second Class Lower
 - b. HND Upper Credit plus PGD credit level in addition to satisfying University matriculation requirements.
- C.** Candidates seeking admission for Doctor of Philosophy (PhD) Degree Programme in Nutrition and Dietetics must have any of the following qualifications from recognized institutions:

Masters degree in Human Nutrition or Nutrition & Dietetics with a minimum GPA of 3.5.

MODE OF STUDY

The mode of study is by course work, seminars and project report/dissertation/thesis.

DURATION

- A.** The Postgraduate Diploma Programme shall run for a minimum duration of two (2) semesters and maximum of four (4) semesters.
- B.** The Full-time Master of Science Degree Programme in Nutrition and Dietetics shall run for a minimum duration of four (4) semesters and maximum of six (6) semesters. The Part-time Master of Science Degree Programme in Nutrition and Dietetics shall run for a minimum duration of six (6) semesters and maximum of eight (8) semesters.
- C.** The Full-Time Doctor of Philosophy Degree Programme shall run for a minimum duration of four(4) semesters and maximum of six (6) semesters
The Part-time Doctor of Philosophy Degree Programme shall run for a minimum duration of six (6) semesters and maximum of eight (8) semesters

EMPLOYMENT OPPORTUNITIES

A. Individuals with Postgraduate Diploma in Nutrition and Dietetics are expected to attain a level of self-reliance. They have varied job opportunities in schools as nutrition educators, in industries as medical delegates, in hospitality industries as food service managers and as entrepreneurs in the larger society. It will especially, equip holders of HND in Nutrition and Dietetics to acquire a Master of Science degree in relevant field to convert to the officer cadre and progress to the highest level as Dietitians

B & C. Most people think that Nutritionists/Dietitians work primarily in a hospital or a Food Service setting. With increased consumer interest in healthy eating and advent of information technology, the role of the registered dietitian has evolved beyond this. Nutritionists/Dietitians are essential members of the health care team and have a wide range of job opportunities.

Work places of Nutritionist/ Dietitians:

Hospital/ rehabilitation centre

Medical clinic with family physicians

Community health centre

Home Care Services Nursing home/long term care facility

Health education/public health agency

Employee cafeteria

School food and nutrition service

Military food and nutrition service

Corrections food and nutrition service

Food industry (manufacturers/producers)

Catering/ hospitality industry

Pharmaceutical industry

Researcher Institutions

Lecturer in Universities and/or teach colleges

Media

Consultant/ private practice

Other government department/ agency

Clinical Nutritionists/ Dietitians: They identify nutrition problems and assess the nutritional status of patients; develop care plans and monitor effectiveness of nutrition interventions; and counsel patients on therapeutic diet modifications.

In the community: Public Health Nutritionists/Dietitians working in Community Centers:

They assess the nutritional needs of populations; identify community nutrition problems; and develop health promotion strategies, nutrition education programs and healthy eating resources. They work with individuals and groups to improve their nutritional well-being; prevent nutrition-related diseases; increase access to food and enhance personal control of health.

In Food Service management: Administrative Nutritionists/Dietitians manage food production, distribution and service of high quality meals/snacks, ensuring adherence to sanitation and safety standards and a cost effective operation. They manage Food Service Departments in hospitals and other health care facilities, schools, universities, and businesses and may be employed by contract food companies.

In private practice:

Consulting Nutritionists /Dietitians: They provide expertise in nutrition to promote health and prevent disease, counseling services for nutrition-related disease and disorders, and management advice to food service operations. They operate their own private consulting practices or businesses and work with, groups, workplaces, and media.

In industry: Nutritionists/Dietitians in Business and Industry assist the private sector with research, development, marketing, and consumer education. Working with food and pharmaceutical companies, marketing association and food service providers, dietitians are able to develop, promote and market better food and nutritional products.

In government, education and research: Nutritionists /Dietitians in government develop nutrition and food policy based on scientific evidence in consultation with stakeholder groups. They also direct and administer nutrition programs and services and may work at the Federal, State, Local Government or Community level.

Nutritionists /Dietitians in Education teach nutrition, food chemistry or food services administration to students in nutrition and dietetics, nursing, medicine, pharmacy, or the food and hospitality industry. These courses are taught at various levels elementary and secondary school, college, university, professional schools and hospitals.

Research Nutritionists/Dietitians plan and direct research projects which will ultimately enhance patient care and improve the cost effectiveness of food service. Universities, health care facilities and industry all support research by Nutritionists/Dietitians.

GRADUATION REQUIREMENTS/SCOPE

A. The postgraduate diploma programme will consist of course work, seminar and project work. Students in Nutrition and Dietetics will complete courses in the stress areas (Introductory/ Foundational courses, Human Nutrition, Dietetics and food administration, Foods and Seminar) in addition to a project work to be carried out under the supervision of approved lecturers. A project report will be submitted by each student as part of the requirements for the award of the Postgraduate Diploma (PGD) in Nutrition and Dietetics.

To be awarded the postgraduate diploma in Nutrition and Dietetics , a candidate must have fulfilled the following conditions:

a) Passed a minimum of 30 Credit Units, as follows:

Courses:	Units
Core courses	18
Electives	9
Project	6
Seminar	3
Total	30

b) Carried out a research relevant to the area of specialization and submitted an acceptable project report.

Stress Areas	Codes
Introductory/Foundational Courses	0
Human Nutrition	1
Dietetics and Food Administration	2
Foods	3
Physiology and Pathology	4
Entrepreneurship	5
Statistics	6
Computer	7
Seminar	8
Project	9

First Semester

Course No.	Course Title	Unit
ND 0503	Introduction to Principles and Practice of Nutrition and Dietetics	3
ND 0511	General and Applied Nutrition	3
ND 0513	Human Biochemistry for Nutritionists	3
ND 0521	Medical Nutrition Therapy 1	3
ND 0545	Human Physiology and Pathology	3
ND 0573	Computer Applications	3
	Total	18

2nd Semester

ND 0522	Medical Nutrition Therapy 11	3
ND 0552	Entrepreneurship 1	3
ND 0564	Statistics and Data processing	3
ND 0582	Seminar	3
ND 0592	Project Report	6
	Total	18

COURSE DESCRIPTION

ND 0503 INTRODUCTION TO PRINCIPLES AND PRACTICE OF NUTRITION AND DIETETICS. (3

Units)

Definition of Nutrition and Dietetics; Nutrition and Dietetics including the necessary academic preparations and personal qualities required. Basic human needs and the role of Nutrition and Dietetics in meeting these needs; Major concepts in Nutrition, nutrients, function, source, malnutrition; adequate diet nutrient needs/requirements; relationship between nutrition and health. Relationship between Nutrition and Dietetics and Agriculture; Nutrition and Dietetics in National Development.

ND 0511 GENERAL AND APPLIED NUTRITION (3 Units)

Nutritive value of tropical foods and Nigerian diets; Adequacy of food supply; selection and formulation of adequate diet, enrichment, supplementation, complementation, fortification; food habits, control of appetite; nutritional needs of children, pregnant and lactating women, adolescents and the aged; nutrition, infection and the immune responses; Physiology of growth , pregnancy and lactation; Nutrient requirement estimates and assessment.

ND 0513: HUMAN BIOCHEMISTRY FOR NUTRITIONISTS (3 Units)

Biochemistry: An overview. Biosynthesis and functions of nucleic acid: DNA, RNA and proteins and their relationship. Structure and functions of enzymes; Carbohydrate metabolism: Glycolysis, pentose phosphate shunt, glycogenesis, glycogenolysis, gluconeogenesis. Fatty acid oxidation, protein oxidation citric acid cycle, oxidative phosphorylation; Metabolism of vitamins and minerals; Role of vitamins and minerals in metabolism of energy nutrients: Vitamins as coenzymes. Inter-relationship of nutrients; effects of diet on biochemical process; inborn errors of metabolism.

ND 0521 MEDICAL NUTRITION THERAPY 1 (3 Units)

Introduction to dietary management in disease states, consideration of factors in patients care plan, co-ordinated nutritional services for patients, therapeutic adaptation of the normal diet. Formulation of standard fluid diets and consideration for osmolality and osmolarity of fluid diets used for therapeutic purposes; Problems of planning therapeutic diets using local foods; Translating recommended nutrient values into serving portion. Principles of nutritional modification for the underweight, overweight, protein energy malnutrition, fevers and infections, including HIV/AIDS and cancers; Pre- and post-operative nutritional care plan and dietary treatment of various organs including nutrient needs in surgery. Study of the diet for the vulnerable group, diarrhoea in infant, oral rehydration therapy.

ND 0522 MEDICAL NUTRITION THERAPY 11 (3 units)

Advanced study in diet and disease states. Application of the basis nutritional principles and diet therapy in the treatment of diseases of specific organs, endocrine, pancreases; various metabolic diseases, liver diseases, gall-bladder disease, kidney disease, cardiovascular disease, acute and chronic heart diseases, atherosclerosis, hyperlipidemia, disease of the nervous system, dietary management of allergic, diet in skin diseases; HIV/AIDS and cancers, study of inborn errors of metabolism and their nutritional care; interaction between drug nutrients and nutritional status.

ND 0545 HUMAN PHYSIOLOGY AND PATHOLOGY (3 Units)

An introduction to basic anatomy of various systems – cell anatomy and physiology, pathology – dehydration, plasmolysis. Nerves and muscles-as agents of communication in

the body. Major organs of the nervous system – brain and spinal cord. Digestive system- with reference to digestion and absorption of nutrients – carbohydrate, lipids, protein, water and micronutrients. Circulatory system – blood movement with reference to nutrient transport etc. Blood and immunity – protective mechanisms of the body, immune responses, inflammation and repair.

ND 0552 ENTREPRENEURSHIP 1 (3 Units)

Entrepreneur- concept, development and need for entrepreneurial development; entrepreneurship growth- economic, social, cultural; personality, psychological and sociological factors affecting growth; traits for entrepreneurial development- functions and roles of women entrepreneurs, problems and strategies for solving problems; entrepreneurial project planning- steps, building plans, using CPM for action plan, resource allocation, budgeting; project implementation- organizing, controlling, launching, monitoring, evaluation; funding agencies- registration of project; filing returns and assessment; institutions for entrepreneurial training; training models and participatory management of human resources performance, appraisal, climate, changing roles and constraints of entrepreneurial development.

Importance and scope of entrepreneurship ; need for developing enterprise; theories of enterprise; theories of enterprise; entrepreneurship-traits, functions and types; process of entrepreneurship and project management; management principles and practices as applicable to entrepreneurship; introduction to accounting and financial statements; sources of finance; financial and developmental institutions assisting small entrepreneurial ventures; location and layout of enterprise; marketing management practices for small scale enterprise.

ND 0564 STATISTICS AND RESEARCH METHODS: (3 Units)

Introduction to research and research designs. Components of a research project . Nutrition survey: steps, planning, sampling technique and sample size determination. Data collection techniques (quantitative and qualitative, constructing questionnaire and interviewing). Techniques used in nutrition research involving laboratory animals and man: balance studies, protein turnover, flux, stable isotope technology etc. Use of experimental diets, ethical consideration; Data processing: sorting data, performing quality-control checks computer computation. Oral Presentation: Choosing the subject, organizing the talk, audio visuals, dealing with questions.

ND 0573 COMPUTER APPLICATIONS (3 Units)

Elements of programming and data base management; network analysis and its use in -diet planning; computerization of menus, meal plans, food cost and recipes used in quantity cooking; recording case history and diet prescription in counseling; recording-anthropometric and clinical data of patients; use of computers in arriving at the nutritional values of

prescribed diets; planning of standard hospital diets for different income groups and computation of nutritional value; computerization of values of clinical laboratory tests and reference standards.

ND 0582 SEMINAR (3 Units)

Discussions of current issues; professionalism and place of research in Nutrition and Dietetics; contemporary nutrition and dietetics problems facing families as a result of the rapid socio-economic changes in society; advances in Nutrition and Dietetics and special problem areas.

HND 0592 PROJECT REPORT (6 Units)

Under the supervision of an academic staff, students carry out research work in selected problem areas of interest, write and present a report in a prescribed format. This is reviewed and assessed by internal and external examiners.

B. The programme consists of course work, dissertation and seminars. To be awarded the Master of Science Degree Programme in Nutrition and Dietetics, a candidate must have fulfilled the following conditions:

(a) Passed a minimum of 36 Credit Units, as follows:

Courses	Units
Core Courses	15
Electives	9
Project	6
Special Topics	3
Advanced Seminar in Nutrition and Dietetics	3
Total	36

(b) Carried out a research relevant to the area of specialization and submitted an acceptable thesis/dissertation.

FIRST SEMESTER

Course Structure

A. Core Courses

Course No.	Title	Unit
------------	-------	------

PGC 601	Research Methodology and Application of ICT in Research	3
ND 601	Instrumentation and Techniques in Nutrition and Dietetics	3
ND 615	Biochemistry of Human Nutrition	3
ND 641	Nutrition Physiology	3
ND 679	Computer Applications	3
ND 681	Advanced Seminar in Human Nutrition	3
ND 683	Special Topics	3
ND 690/691	Thesis/Dissertation	6
Total		27

SECOND SEMESTER

Electives in areas of specialization

a) Dietetics

Course Number	Title	Unit
ND 612	Geriatric Nutrition & Social Welfare	3
ND 616	Maternal, Infant and Child Nutrition	3
ND 620	Advanced Medical Nutrition Therapy	3
ND 622	Nutritional Epidemiology	3
ND 628	Diet Counselling	3
ND 630	Food and Nutrition Planning & Policy	3
ND 660	Statistics and Research Methods	3
Total		21

--	--	--

b. Community and Public Health Nutrition

Course Number	Title	Unit
ND 610	Advanced Community Nutrition and Public Health	3
ND 616	Maternal, Infant and Child Nutrition	3
ND 618	Nutrition Programme, Planning and Implementation	3
ND 622	Nutritional Epidemiology	3
ND 624	Nutrition Rehabilitation and Disability	3
ND 626	Nutrition Education Extension and Training	3
ND 630	Food & Nutrition in Emergencies	3
ND 638	Food & Nutrition in Emergency	3
ND 643	Protein & Energy Metabolism	3
ND 645	Carbohydrate & Fat Metabolism	3
ND 660	Statistics and Research Methods	3
Total		24

C. Human and Experimental Nutrition

Course numbers	Title	Unit
ND 630	Food and Nutrition Planning & Policy	3
ND 642	Vitamin and Mineral Nutrition	3
ND 644	Energy balance and body Composition	3
ND 646	Advanced Physiology of Human Nutrition	3
ND 648	Nutrient Interrelationships	3
ND 660	Statistics and Research Methods	3
Total		18

COURSE DESCRIPTION

PGC 601: Research Methodology and Application of ICT in Research (3 Units)

In-depth research aimed at acquiring full knowledge and presentation in scholarly writing of the concepts, issues, trends in the definition and development of the study area from Africa and Western perspectives. Major steps in research: Selection of problem, Literature review, Design, Data collection, analysis and interpretation, Conclusions. Study of various research designs, Historical, Case studies, Surveys, Descriptive, Cross sectional, Experimental, etc. Analysis, surveys and synthesis of conceptual and philosophical foundations of different disciplines. Identifications of research problems and development of research questions and or hypotheses. Detailed treatment of methods of collecting relevant data and the format for presenting research results (from designing the table of contents to referencing, bibliography and appendix). Data analysis and result presentation in different disciplines using appropriate analytical tools. Methods of project/dissertation writing. Application of appropriate advanced ICT tools relevant in every discipline for data gathering and result presentation. Essentials of spreadsheets, Internet technology, and internet search engines All registered Masters Degree students must attend a solution-based interactive workshop to be organized by the School of Postgraduate studies for a practical demonstration and application of the knowledge acquired from the course conducted by selected experts.

ND 601: Instrumentation and Research Methods in Nutrition and Dietetics (3 Units)

Microcomputers and statistical packages and procedures in human nutrition research; nutritional instrumentation and selected instruments in food study and nutrient analysis; rapid and detailed methods in nutrition surveys; coverage, sampling, work execution, processing and use of survey results; methods of energy expenditure and body composition; planning of

diets for nations, groups and individuals, visual aids and testing of nutrition information, education and communication and communication use of radio isotope in nutrition research, ethical considerations in nutrition research. Nutribusiness and application, research proposal writing and presentation.

ND 610: ADVANCED COMMUNITY NUTRITION AND PUBLIC HEALTH

(3 Units)

Food consumption tables, nutrient requirements and adequacy of diets of individuals and groups, food availability. Detailed methodology and application in the assessment of nutritional status of different groups in the community using established standard methods, their uses and pitfalls, - Design, implement and interpret anthropometric surveys in urban and rural settings, food balance sheets, food consumption methods, vital statistics, clinical signs, construction and use of questionnaires, choosing nutritional indicators, use of reference populations and cut-off points. Conceptual framework, nutrition services and programmes. Feeding of special groups; appraisal of nutritional problems and solutions; use of growth and development charts and growth monitoring; public health nutrition problems in urban and rural areas, income generation activities of women, community based nutrition programmes. Population and food supply. Nutrition Learning and behavior. Assessment of ecological and seasonal factors, nutrition, poverty and welfare, conceptual framework and assessment of food consumption and factors.

ND 612: GERIATRIC NUTRITION AND SOCIAL WELFARE

(3 Units)

Nutrition and longevity, nutrition, poverty and family welfare, nutrition support of the aged, social, cultural and economic implications. Nutritional status. Low cost, and acceptable foods in ageing, income generation activities during ageing, promoting autonomy and self-reliance. Training and workshop for the aged, control of seasonal shortages of foods, problems and functional impairment in geriatric feeding, food choice, recognizing and helping the disabled, safe nutrition for all, micronutrients and disease, socio-economic and cultural factors in food consumption patterns. Nutrition in institutional services, adequacy of diets in the elderly and disabled, improving social and economic services of the elderly groups, nutritional stress and coping strategies.

ND 615 BIOCHEMISTRY OF HUMAN NUTRITION

(3 Units)

Metabolism and biochemical interrelationship of various nutrients in human body and their metabolic pathways, metabolism of nutrients in important nutritional disease, genetic factors and disease, in born errors of metabolism (1) Glycolytic pathway (2) Tricarboxylic and (3) Electron transport.

ND 616: MATERNAL, INFANT AND CHILD NUTRITION

(3 Units)

Outcome of diets before and after pregnancy, foetus as a parasite, cellular growth, nutrition in pregnancy and lactation; foetal nutrition, growth and development; deficiency diseases, nutrition in childhood, breastfeeding promotion and support, growth monitoring; complementary and infant feeding practices, “the weanling’s dilemma”, appropriate complementary foods and related technology, social marketing for women and children, micronutrient and maternal and child nutrition, assessment, analysis and action (AAA) and appropriate interventions related to maternal, infant and child mortality, child survival, other maternal and child nutrition programmes, appropriate nutrition counseling, management of severely malnourished children at home and in hospital setting.

ND 618: NUTRITION PROGRAMME, PLANNING AND IMPLEMENTATION

(3 Units)

Appropriate policy in the diagnosis of target group’s nutrition situation, prioritizing national nutrition policy programmes. Political and economic influences. Challenges of women in agriculture; process of presenting bills to government and other agencies, food laws and legislation, policy analysis and decision making, early warning systems for nutrition surveillance, nutrition situation analysis and strategy identification and development, evaluation and monitoring of nutrition programmes at all levels, role of nutrition related agencies in programme implementation at national level; functions of ethical committee in nutrition research; food and nutrition policy experiences in developing and developed countries for national decision making.

ND 620: ADVANCED MEDICAL NUTRITION THERAPY AND HOSPITAL PRACTICE

(3 Units)

Critical evaluation of the current issues in the application of nutritional principles and diets to the prevention and treatment of nutrition and nutrition related diseases and conditions other than normal. Aetiology, presentation and practical Medical Nutrition management of diseases such as: Diabetes, hypertension, cardiovascular diseases etc with experiences at a the University of Nigeria Teaching Hospital, ante-natal and child welfare clinics, role of dietetic departments, relationship between diet and disease, methods of preventing by dietary modifications e.g., non communicable diet- related diseases such as CHD, hypertension,

diabetes, cancer, obesity, and nutrition deficiency diseases, protein energy malnutrition, anaemia, IDD, Vitamin A..

ND 622: NUTRITIONAL EPIDEMIOLOGY (3 Units)

Developmental issues and uses and pitfalls of epidemiology in relation to food and nutrition, major nutritional diseases, pathological, histological and demographic characteristics found in malnutrition, nutrition and patient care. Nutrition and infection, and immunology. Concepts and designs of statistical and epidemiological investigation and human nutrition; design, data collection and analysis of epidemiological studies, treatment of nutritional disease; epidemiology in food and nutrition policy and planning; adequacy of diets, epidemiology and health information systems, and retrievals. Design, evaluation and monitoring of dietary and other interventions to reduce risk factors of diseases.

ND 624: NUTRITION REHABILITATION AND DISABILITY (3 Units)

Types of nutrition rehabilitation programmes, formal and informal nutrition programmes, community based nutrition rehabilitation programmes, refugees and street children, supplementary and group feeding of disadvantaged children in care, establishment and management of nutrition rehabilitation programmes, NGO initiatives and agencies (WHO, UNICEF, OXFAM Save the Children Fund), adequacy of diets in institutional homes, problems and solutions of social and economic factors on nutritional status, risk groups in society.

ND 626: NUTRITION EDUCATION, EXTENSION SERVICES AND TRAINING (3 Units)

Information, Education and Communication (IEC) in applied nutrition practice; social anthropology and psychology of nutrition; methods in nutrition education, organization of nutrition services and programmes, education messages, family budgets and economic aspects of nutrition. Nutrition education in methods of food storage, preservation and processing; available visual aids in nutrition, food habits and their study. Nutrition education and action programme for preschool and school age children, adolescents, adults and elderly, food sources available in the community and various approaches to improved nutrition at different income levels in urban and rural settings.

ND 628 DIET COUNSELING (3 units)

Procedures of nutritional counseling in clinical practice; preparing nutritional and dietary care plans for individuals and groups; development of resources and dietary guidelines for counseling; records for follow up study; group discussion and motivation as tools to bring attitudinal changes in food selection and preparation; exercises on writing scientific facts in simple manner for people; use of exhibitions, demonstrations and workshops; setting up counseling units and counseling in outpatient clinics in local hospitals; simulation techniques for counseling in selected settings.

ND 630: FOOD AND NUTRITION POLICY AND PLANNING (3 Units)

Appropriate policy in the diagnosis of target group's nutrition situation, prioritizing national nutrition policy programmes. Political and economic influences. Challenges of women in agriculture; process of presenting bills to government and other agencies, food laws and legislation, policy analysis and decision making, early warning systems for nutrition surveillance, nutrition situation analysis and strategy identification and development, evaluation and monitoring of nutrition programmes at all levels, role of nutrition related agencies in programme implementation at national level; functions of ethical committee in nutrition research; food and nutrition policy experiences in developing and developed countries for national decision making.

ND 638: FOOD AND NUTRITION IN EMERGENCIES

(3 Units)

Nature and types of emergencies, nutrition targeting in food emergencies, the roles of non-governmental and governmental organizations involved in emergencies, food and nutrition procedures, famine relief operations, organization of nutrition services in emergencies, nutritional information, education and communication, programme monitoring, evaluation and intervention actions, methods in situation reports, key policy issues and role of nutritionist in emergencies.

ND 641: NUTRITIONAL PHYSIOLOGY

(3 Units)

The cell and its functions; Human Body Composition; Digestive problems (e.g. Dry-mouth ulcers) and Composition, structure and function of gastrointestinal tract, liver, gall bladder; The endocrine glands, body fluid and kidneys; Regulations of Fluid; Balance, Blood structure and functions of nerve, muscles and bones; Allergy and immunity. Physiology of growth, pregnancy, lactation, aging and adaption to environmental changes; (1) Principle of homeostasis (2) Feedback mechanisms.

ND 642: VITAMINS AND MINERAL NUTRITION

(3 Units)

Detailed examinations of the chemistry, structures and functions of water soluble and lipid soluble vitamins, sources in diets. Macro-nutrients, sources, functions, metabolism, deficiency or toxicity symptoms of essential macro-nutrients and micro-nutrients, recommended and estimated safe and adequate daily dietary intakes of micronutrients, methods of assessing requirement levels in man. HPLC of macro and micromolecules, mineral balance and mineral-vitamin interrelationships.

ND 643: PROTEIN AND ENERGY METABOLISM

(3 Units)

Definition of terms, structural organization of cells, bioenergetic, free energy and high energy phosphates, physiological value of foods, energy and protein requirements. Structure and functions of amino acids, proteins and nucleic acids, protein and energy absorption and metabolism and storage in animals and man, metabolic pathways of proteins and amino acids, antibodies and immune response, biochemical aspects of hormones, separation of amino acids, peptide, myoglobin and haemoglobin, general properties of enzymes, and biological oxidation, catabolism of proteins and amino acid nitrogen, catabolism of carbon skeletons of amino acids, protein and nitrogen balance, biochemical detection of protein-energy malnutrition, biochemistry of extracellular and intracellular communications in man.

ND 644: ENERGY BALANCE AND BODY COMPOSITION (3 units)

Body compartment discussed in detail; concept of energy balance; New methods in the measurement of body compartment and energy balance discussed.

ND 645: CARBOHYDRATE AND FAT METABOLISM (3 Units)

Classification of fats and carbohydrates. Lipids, CHO of physiologic importance, metabolism and biosynthesis of fat and carbohydrate. Control of blood glucose, nutrient and integration of fat and carbohydrate metabolism, regulation of lipogenesis, cytolysis, metabolism of unsaturated fatty acids, sphingolipids, etc, lipid transport and storage, chylomicrons and very low density lipoproteins. Cholesterol, relationship of liver to fat metabolism, blood and body fluid levels of lipids and glycogen in health and disease, fermentation and respiration, alcoholic fermentation.

ND 646: ADVANCED PHYSIOLOGY OF HUMAN NUTRITION (3 Units)

The cell, tissues and organs of the body, digestion and absorption of nutrients, digestive process, physiology of gastrointestinal tract, effects of hormones, classification of hormones, regulation of nutrients by hormones, extracellular and intracellular materials in the body, muscles and chemical energy, plasma immunoglobulin and blood coagulation, the blood cells, cancer and growth factors, physiology of foetus, newborn, pregnancy, and lactation and internal environment, functional requirements of nutrients in the body, origin and physiological significance of nitrogen constituents of urine, nutro-physiological experimentation and experimental approaches to intermediary metabolism.

ND 648: NUTRIENT INTERRELATIONSHIPS (3 Units)

Protein and energy interaction; interaction of protein and energy with other nutrients; interaction involving dietary phytate and inositol phosphates; mineral-mineral interaction; nutrient antagonisms and enhancers; factors influencing bio-availability of nutrients.

ND 660 STATISTICS AND RESEARCH METHODS**(3 Units)**

Introduction to research and research designs. Components of a research project . Nutrition survey: steps, planning, sampling technique and sample size determination. Data collection techniques (quantitative and qualitative, constructing questionnaire and interviewing). Techniques used in nutrition research involving laboratory animals and man: balance studies, turnover, flux, stable isotope technology etc. Use of experimental diets, ethical consideration; Data processing: sorting data, performing quality-control checks computer computation. Oral Presentation: Choosing the subject, organizing the talk, audio visuals, dealing with questions.

ND 679 COMPUTER APPLICATIONS IN NUTRITION AND DIETETICS**(3 Units)**

Elements of programming and data base management; network analysis and its use in -diet planning; computerization of menus, meal plans, food cost and recipes used in quantity cooking; recording case history and diet prescription in counseling; recording-anthropometric and clinical data of patients; use of computers in arriving at the nutritional values of prescribed diets; planning of standard hospital diets for different income groups and computation of nutritional value; computerization of values of clinical laboratory tests and reference standards

ND 681: ADVANCED SEMINAR IN HUMAN NUTRITION**(3 Units)**

Each postgraduate student is expected to present an oral report in course of training based on library research or observations of research problems and development in selected current topics in human nutrition. The topic so selected will not be in his/her area of research.

ND 683: SPECIAL TOPICS IN NUTRITION AND DIETETICS**(3 Units)**

Exploration by guided study of special interest in human nutrition, for the individual postgraduate student and presented in a seminar or short written report with guidance of academic staff.

ND 690/ 691: THESIS/DISSERTATION**(6 Units)**

Each student is expected to study fairly critically under controlled supervision by an academic staff a special problem in the chosen area of specialization in a dissertation. Students who presents a dissertation is expected to finally defend his/her findings before a panel of approved internal and external examiners. Each student must give an oral report in a

seminar prior to presentation of unbound copies of findings to the head of department through his/her supervisor

C.The programme consists of course work, project work and seminars. To be awarded the Doctor of Philosophy Degree in Human Nutrition and Dietetics, a candidate must have fulfilled the following conditions:

(a) Passed a minimum of 36 Credit Units, as follows:

Courses	Units
Core courses	6
Elective courses	12
Thesis/Dissertation	12
Seminar	6
Total	36

(b) Carried out a research relevant to the area of specialization and submitted an acceptable thesis.

First Semester (core courses)

Units		
PGC 701	Synopsis and Grant Writing	3
ND 760	Statistics and Research Methods in Nutrition & Dietetics	3
ND 780	Advanced Seminar 11	3
ND 781	Advanced Seminar 1	3
ND 790/791	Thesis/Dissertation	12
Total		24

Second Semester

Courses in areas of specialization (electives)

a. Dietetics

		Units
ND 710	Advances in International Nutrition & Cooperation	3
ND 720	Dietetic Entrepreneurship	3
ND 722	Advances in Clinical Nutrition & Dietetics	3
ND 724	Recent Advances in Dietetic Practice	3
ND 726	Special Topics	3
ND 730	Food Quality and Safety	3
Total		18

b. Community and Public Health Nutrition

ND 710	Advances in International Nutrition & Cooperation	3
ND 712	Adolescent Nutrition	3
ND 714	Nutrition Economics	3
ND 716	Comparative Nutrition	3
ND 726	Special Topics	3
ND 732	Food Consumption and Dietary Assessment	3
Total		18

c. Human and Experimental Nutrition

ND 700	Design and Practice in Experimental Nutrition	3
ND 710	Advances in International Nutrition & Cooperation	3
ND 716	Comparative Nutrition	3
ND 718	Recent Advances in Experimental Nutrition	3
ND 726	Special Topics	3
ND 740	Human Nutrient Requirement Estimate and Assessment	3
Total		18

COURSE DESCRIPTION**PGC 701: Synopsis and Grant Writing****(3 Units)**

Identification of types and nature of grant and grant writing, miming of grants application calls on the internet. Determining appropriate strategy for each grant application. Study of various grant application structures and contents and writing of concept notes, detailed project description, budgeting and budget defence. Study of sample grant writings in various forms and writing of mock research and other grants. Identification of University of Nigeria synopsis structure and requirements (Introduction, Methodology, and Results). Determining the content of each sub-unit of the synopsis. Steps in writing of synopsis from the Dissertation/Thesis document. Structural and language issues. Common errors in synopsis writing and strategies for avoiding them. The roles of the student and the supervisor in the production of synopsis. Writing of mock synopsis. All PhD students must attend a solution-based interactive workshop to be organised by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course conducted by selected experts.

ND: 700: Design and Practice in Experimental Nutrition (3 Units)

Design in experimental nutrition, describe data processing needs. Data collection, organization and presentation, use of animal models in experimental nutrition, ethics in experimental nutrition, use of experimental diets, special analytical techniques in experimental nutrition for foods and diets; statistical methods and application, planning of research and investigation methods, interpretation of experimental data, systems of evaluating nutritive value of foods.

ND 710: Advances in International Nutrition and Cooperation (3 Units)

Global dynamics of population and food supply and demand problems and solutions, concepts of triple A cycle and conceptual framework. Role of international agencies in averting world hunger. Global environmental protection and nutrition. International nutrition policy and programmes; political dimensions and international economy of foods, concepts of international food security and cost of malnutrition. Government and non-governmental organizations; bilateral and multilateral cooperations; technical assistance and consultancies in nutrition. Meeting the world nutrition goals. International migration and world ethnic minority.

ND 712: Adolescent Nutrition (3 Units)

Psychological problems of the adolescents; adolescents with special nutrition needs- athletes, pregnant adolescents; institutionalized adolescent meals; group feeding of the adolescents; meeting individual dietary needs; feeding problems- anorexia nervosa, bulimia, obesity etc.

ND 714 : Nutrition Economics (3 Units)

General review of economic principles; World Food Production situation; Relationships linking employment, food and population growth, income generation and effective demand for food and the quality of food in developing countries: Economics of food production, marketing, distribution, consumption and nutrition. Human food requirement, the major food groups and the economic characteristics (including least-cost diet analysis and historical trends in food consumption) techniques of national food accounting (including data collection and evaluation) the project of demand, and the segregation of data for analysis of particular problem groups and areas (notably the burgeoning number of urban dwellers and peasants-bypes by technological change)

ND 716: Comparative Nutrition (3 units)

Adaptation of the digestive system to feeding habits in man and animals involved in digestion and absorption; energy needs and utilization; most important

metabolic differences among animals. feeding patterns: vegetarians, herbivorous, carnivores.

ND 718: Recent Advances in Experimental Nutrition (3 units)

Students are required to review literature (journals, periodicals, etc) in order to be at breast with the recent developments in experimental nutrition. These developments are discussed extensively in class. Students are also expected to participate actively in the discussions.

ND 720: Dietetics Entrepreneurship (3 units)

An understanding of the different job opportunities that are available to Dietitians in dietetic practice. Roles of administrative Dietitians in ministries, civil service establishment, recruitments and research institute. Roles of Dietitians in clinical settings. Roles of Dietitians in educational institutions and consultative roles of Dietitians.

ND 722: Advances in Clinical Nutrition and Dietetics (3 units)

Differences between a clinical Nutritionist and a clinical Dietitian. Deeper understanding of the major activities involved in dietetic practice. Understanding of foods, food composition, wise food selection and consumption to meet physiologic, socioeconomic and intellectual needs. Aetiology, presentation and practical management of nutrition related diseases eg diabetes, hypertension, coronary heart diseases, cancer, obesity, PEM, anaemia, Iodine Deficiency Disorders, vitamin A deficiency, HIV/AIDS. Review of literature on the recent development in diet related diseases. Students are expected to review the literature for advances in dietetics practice. These will be discussed in class and their application in Nigeria discussed.

ND 724: Recent Advances in Dietetic Practice (3 Units)

Students and their lecturers are expected to review the literature for advances in dietetic practice. These will be discussed in class and their application in Nigeria discussed.

ND 726: Special Topic (3 Units)

Exploration by guided study of special interest in human nutrition, for the individual postgraduate student and presented in a seminar or short written report with guidance of academic staff.

ND 730: Food Quality and Safety (3 Units)

Quality attributes and characterization of various foodstuffs for human consumption, safe levels of foods by physical, organoleptic, chemical and

microbiological examination, food laws and regulations, food standards and their enforcement, waste disposal, personal hygiene, food toxicants, sources, occurrence and problems, and effects on food. Pests, pesticide and chemical control, quality and storage, marketing and level of nutrients, methods of evaluating safe food for all. Food labeling, codex alimentarius.

ND 732: Food Consumption and Dietary Assessment (3 units)

Individual and group food intake methods-dietary recalls, food frequency questionnaires; food records, diet histories, etc; advantages and disadvantages; measurement errors in food intake; measurements and how to control them; food composition databases; problems associated with dietary assessment in Nigeria.

ND 740: Human Nutrient Requirements, Estimates and Assessment (3 units)

An overview of available nutrient requirement table and standards; methods for determining these standards for energy, protein, major minerals and vitamins; comparison of different national and United Nations RDA.

ND 760 Statistics and Research Methods in Nutrition & Dietetics (3 Units)

Introduction to research and research designs. Components of a research project. Nutrition survey: steps, planning, sampling technique and sample size determination. Data collection techniques (quantitative and qualitative, constructing questionnaire and interviewing). Techniques used in nutrition research involving laboratory animals and man: balance studies, turnover, flux, stable isotope technology etc. Use of experimental diets, ethical consideration; Data processing: sorting data, performing quality-control checks computer computation. Oral Presentation: Choosing the subject, organizing the talk, audio visuals, dealing with questions.

ND 780: Advanced Seminar 11 (3 Units)

Each post- graduate student is expected to present an oral report, in course of training, based on library research or observation of research problems and development in selected current topics in human nutrition. The topic so selected will not be in his/her area of research.

ND 781: Advanced Seminar 1 (3 Units)

Each post- graduate student is expected to present an oral report, in course of training, based on library research or observation of research problems and development in selected current topics in human nutrition. The topic so selected will not be in his/her area of research.

ND 790/791: Thesis (12 Units)

The Ph.D. candidate shall undertake a comprehensive and original research in his or her area of specialization to be embodied in a thesis which shall contain publishable material as proven contribution to knowledge in human nutrition. Each Ph.D. student is expected to complete a thesis on comprehensive original research in the chosen area of specialization.