

**SCHOOL OF APPLIED HUMAN SCIENCES
KENYATTA UNIVERSITY**

**DEPARTMENT OF FOOD, NUTRITION AND
DIETETICS**

**BACHELOR OF SCIENCE DEGREE IN FOOD,
NUTRITION AND DIETETICS**

AUGUST, 2014

BACHELOR OF SCIENCE DEGREE IN FOOD, NUTRITION AND DIETETICS

PREAMBLE

In Sub-Saharan Africa, disease and malnutrition are high and there is need for feasible and effective intervention programmes. In view of this, the government in its policy framework has recognized the role of health and nutrition in the well being of the population and incorporated them into its development programmes. Nutrition and health has therefore become a very important aspect of development, necessitating the training of professionals in the field of nutrition.

1. RATIONALE

The emerging nutrition and health problems pose a need to offer specialized training in the area of nutrition and health in order to provide appropriate advice and services. Currently, sub-Saharan Africa needs more trained expertise in this area to serve the diversified public health and nutritional needs and, therefore, the need for this programme. Through teaching, research and service the department will train manpower with the capacity to deal with emerging nutrition and health issues and hence bridge the existing capacity gaps in health and nutrition programmes.

2. VISION

To train highly qualified professionals in field of Food, Nutrition and Dietetics for improved livelihoods.

3. MISSION

The mission of the programme is to provide qualified professionals in the area of Food, Nutrition and Dietetics through teaching, research and community outreach.

4. COURSE OBJECTIVES:

The objectives of the programme are to:

1. Equip students with scientific knowledge and skills in food security, community nutrition and dietetics.
2. Equip students in planning, implementing and management of nutrition and health related programmes.
3. Offer training that will enable students to work in a variety of settings such as the hospital, food industry, research institutions, NGOs, emergencies and in community-based programmes.
4. Offer training that serves as a foundation for further studies and research in nutrition and health related programmes, that addresses emerging issues in nutrition.
5. Offer training that will enhance creativity that shall lead to self-reliance
6. Offer training that provides leadership and advocacy skills in solving problems related to in Food, Nutrition and Dietetics.

5. ENTRY REQUIREMENTS

- 5.1 Candidates must satisfy the minimum entry requirements of Kenyatta University and the School of Applied Human Sciences of a mean grade of C+(plus) at KCSE or its equivalent.
- 5.2 In addition candidates must have a minimum grade of C+(plus) in each of the following subjects; Mathematics, Biology/Biological Science, Chemistry/Physical Science, English/Kiswahili.

5.3 Or, Diploma holders in Nutrition and Dietetics or Nutrition and Food Science with a credit pass and a grade of C at KCSE

6. CREDIT TRANSFER

6.1 University regulations shall apply.

7. DEGREE STRUCTURE

7.1 The Department of Foods, Nutrition and Dietetics shall offer Bachelor of Science Degree in Food, Nutrition and Dietetics.

7.2 The programme shall be offered on full time and Institutional Based Programme (IBP). In order to graduate with a Bachelor of Science Degree in Food, Nutrition and Dietetics, the candidate must have done and passed at least 56 units. First Level 3 UCUs and 11 Departmental units, Second Level 14 units, Third Level 14 units and Fourth Level 14 Units.

8. DURATION

8.1 Programme shall take 4 academic years or 8 semesters for students on fulltime programme. The student should study for a minimum of 3580 hours. A theory unit will be 3 hours per week, 15 weeks, 45 hours in total per semester. A practical unit will be 7 hours a week, 15 weeks, 72 hours in total per semester.

8.2 Within the period of study, there will be two practicum sessions each lasting three months, a minimum of 480 hours each. One practicum will be done in a clinical setting (480 hours), the second will be done in a community setting.

8.3 In order to qualify for KNDI registration graduates are required to undertake a one year internship after graduation.

9. EXAMINATION

9.1 University regulations shall apply.

9.2 All units (Except for Seminar in Food, Nutrition and Dietetics, Project in Food, Nutrition and Dietetics and Practicum) shall be examined at the end of the semester. The examination will comprise of two Continuous Assessment Tests totaling to 30% and one examination of 70%.

9.3 For Seminar in Food, Nutrition and Dietetics the report will constitute 60% and oral presentation of 40%.

9.3.1 For Project in Food, Nutrition and Dietetics, the proposal will constitute 20% report 60% and presentation 20%.

9.3.2 For Practicum examination: the diary will consist of 20%, the main report 40%, the external assessor's report 20% and the lecturer's assessment 20%.

COURSE STRUCTURE

Year I		
Semester I		
University Common Units		
Course Code	Course title	Hours
UCU 101	Development Studies	35 hours
UCU 103	Introduction to Critical and Creative Thinking	35 hours
Department of Food, Nutrition and Dietetics		
Course Code	Course title	Hours
SMA 100	Mathematics for Science I	45 hours
HFN 141	Introduction to Food, Nutrition and Dietetics	45 hours
HFN 142	Physical and Inorganic Chemistry	72 hours
HFN 143	First Aid	72 hours
HFN 144	Macronutrients	45 hours
Semester II		
University Common Units		
Course Code	Course title	Hours
UCU 100	Communication Skills	35 hours
Department of Food, Nutrition and Dietetics		
Course Code	Course title	Hours
HFN 145	General Biology	72 hours
HFN 146	Nutrition in the Lifespan	45 hours
HFN 147	Organic Chemistry	45 hours
HFN 148	Sociology for Food, Nutrition and Dietetics	45 hours
HFN 149	Micronutrients	45 hours
HFN 150	Information and Communication Technology for Food, Nutrition and Dietetics	72 hours
Year II		
Semester I		
Course Code	Course title	Hours
HFN 240	Foundations of Food Preparation	72hours
HFN 241	Human Nutrition	45 hours
HFN 242	Food Microbiology and Parasitology I	72 hours
HFN 243	Nutrition in HIV and AIDS	45 hours
HFN 244	Primary Health Care	45 hours
HFN 245	Human Anatomy	72 hours
HFN 246	Nutrition Assessment	72 hours
Semester II		
Course Code	Course title	Hours
HFN 247	Nutrition Anthropology	45 hours
HFN 248	Meal Planning, Management and Services	72 hours
HFN 249	Nutrition and Psychology	45 hours
HFN 250	Nutrition and Disease Management I	45 hours
HFN 251	Life Skills	45 hours

HFN 252	Human Physiology	72 hours
HFN 253	Nutrition Surveillance	45 hours
Year III		
Semester I		
Course Code	Course title	Hours
HCU 300	Introduction to Research Methods	45 hours
HFN 341	Maternal and Child Nutrition	45 hours
HFN 342	Nutrition and Sports	45 hours
HFN 343	Entrepreneurship in Nutrition	45 hours
HFN 344	Food Microbiology and Parasitology II	72 hours
HFN 345	Nutrition and Disease Management II	45 hours
HFN 346	Nutrition Counseling	72hours
Semester II		
Course Code	Course title	Hours
HFN 347	Biostatistics in Nutrition	45 hours
HFN 348	Analytical Chemistry	72 hours
HFN 349	Nutrition Education	72 hours
HFN 350	Food Biotechnology	72 hours
HFN 351	Nutrition Biochemistry	72 hours
HFN 352	Therapeutic Dietetics	72 hours
HFN 353	Practicum I	480 hours
Year IV		
Semester I		
Course Code	Course title	Hours
HFN 440	Food and Nutrition Security	45 hours
HFN 441	Principles of Food Processing, Preservation and Storage	72 hours
HFN 442	Nutrition in Emergencies	45 hours
HFN 443	Food Chemistry	72 hours
HFN 444	Project in Food, Nutrition and Dietetics	72 hours
HFN 445	Nutrition Intervention, Programme Planning, Monitoring and Evaluation	45 hours
HFN 446	Nutrition Care Process and Therapy	72 hours
Semester II		
Course Code	Course title	Hours
HFN 447	Seminar in Food, Nutrition and Dietetics	45 hours
HFN 448	Food Analysis	72 hours
HFN 449	Nutrition Epidemiology	45 hours
HFN 450	Food Safety Hygiene and Legislation	45 hours
HFN 451	Nutrition Pharmacology	45 hours
HFN 452	Leadership and Policy in Food, Nutrition and Dietetics	45 hours
HFN 453	Nutrition and Behaviour	45 hours
HFN 454	Practicum II	480 hours

CONTACT HOUR DISTRIBUTION

Code	Unit Name	ID	Lecture hours per week	Practical hours	Total semester contact hours plus two hours exams	Total number of weeks	Total unit hours per semester
UCU 101	Development Studies	T	3	-	35	12	35
UCU 103	Introduction to Critical and Creative Thinking	T	3	-	35	12	35
SMA 100	Mathematics for science I	T	3	-	45	15	45
HFN 141	Introduction to Food, Nutrition and Dietetics	T	3	-	45	15	45
HFN 142	Physical and Inorganic Chemistry	PT	2	3*	72	15	45
HFN 143	First Aid	PT	2	3*	72	15	45
HFN 144	Macronutrients	T	3	-	45	15	45
UCU 100	Communication Skills	T	3	-	35	12	35
HFN 145	General Biology	PT	2	3*	72	15	45
HFN 146	Nutrition in the Lifespan	T	3	-	45	15	45
HFN 147	Organic Chemistry	PT	2	3*	72	15	45
HFN 148	Sociology FOR Food, Nutrition and Dietetics	T	3	-	45	15	45
HFN 149	Micronutrients	T	3	-	45	15	45
HFN 150	Information and Communication Technology	PT	2	3*	72	15	45
PT = Practicals T= Theory		*Laboratory practical per week; ** Health facility practical per week; *** Field work per semester					
<p>Note:</p> <ol style="list-style-type: none"> 1. A Unit is defined as an equivalent of 1 lecture or 2 hours of tutorial or 3 hours practical. Each unit will be offered in 3 units per as a minimum. 2. The following hours are included to fulfill the requirements of the practicum: Clinical practicum: 618 hours Community practicum: 800 hours 							

Code	Unit Name	ID	Lecture hours per week	Practical hours	Total semester contact hours plus two hours exams	Total number of weeks	Total unit hours per semester
HFN 240	Foundations of Food Preparation	PT	2	3*	72	15	45
HFN 241	Human Nutrition	T	3	-	45	15	45
HFN 242	Food Microbiology and Parasitology I	PT	2	3*	72	15	45
HFN 243	Nutrition in HIV and AIDS	T	3	-	45	15	45
HFN 244	Primary Health Care	T	3	40***	45	15	45
HFN 245	Human Anatomy	PT	3	3*	72	15	45
HFN 246	Nutrition Assessment	PT	3	40***	45	15	45
HFN 247	Nutrition Anthropology	T	3	40***	45	15	45
HFN 248	Meal Planning, Management and Services	PT	2	3*	72	15	45
HFN 249	Nutrition Behaviour and Psychology	T	3	-	45	15	45
HFN 250	Nutrition and Disease Management I	PT	3	6**	126	15	45
HFN 251	Life Skills	T	3	-	45	15	45
HFN 252	Human Physiology	PT	2	3*	72	15	45
HFN 253	Nutrition Surveillance	T	3	40***	45	15	45
PT = Practicals T= Theory		*Laboratory practical per week; ** Health facility practical per week; *** Field work per semester					
Note:							
3. A Unit is defined as an equivalent of 1 lecture or 2 hours of tutorial or 3 hours practical. Each unit will be offered in 3 units per as a minimum.							
4. The following hours are included to fulfill the requirements of the practicum: Clinical practicum: 618 hours Community practicum: 800 hours							

Code	Unit Name	ID	Lecture hours per week	Practical hours	Total semester contact hours plus two hours exams	Total number of weeks	Total unit hours per semester
HCU 300	Introduction to Research Methods	T	3	-	45	15	45
HFN 341	Maternal and Child Nutrition	T	3	-	45	15	45
HFN 342	Nutrition and Sports	T	3	-	45	15	45
HFN 343	Entrepreneurship in Nutrition	T	3	-	45	15	45
HFN 344	Food Microbiology and Parasitology II	PT	2	3*	72	15	45
HFN 345	Nutrition and Disease Management II	T	3	6**	126	15	45
HFN 346	Nutrition Counseling	PT	2	6**	126	15	45
HFN 347	Biostatistics	T	3	-	45	15	45
HFN 348	Analytical Chemistry	PT	2	3*	72	15	45
HFN 349	Nutrition Education	PT	2	40***	45	15	45
HFN 350	Food Biotechnology	PT	2	3*	72	15	45
HFN 351	Nutrition Biochemistry	PT	2	3*	72	15	45
HFN 352	Therapeutic Dietetics	PT	2	6**	126	15	45
HFN 353	Practicum I	PT	-	40**	480	15	480
PT = Practicals T= Theory		*Laboratory practical per week; ** Health facility practical per week; *** Field work per semester					
Note:							
5. A Unit is defined as an equivalent of 1 lecture or 2 hours of tutorial or 3 hours practical. Each unit will be offered in 3 units per as a minimum.							
6. The following hours are included to fulfill the requirements of the practicum: Clinical practicum: 618 hours Community practicum: 800 hours							

Code	Unit Name	ID	Lecture hours per week	Practical hours	Total semester contact hours plus two hours exams	Total number of weeks	Total unit hours per semester
HFN 440	Food and Nutrition Security	T	3	40***	45	15	45
HFN 441	Principles of Food Processing, Preservation and Storage	PT	2	3*	72	15	45
HFN 442	Nutrition in Emergencies	T	3	40***	45	15	45
HFN 443	Food Chemistry	TP	2	3*	72	15	45
HFN 444	Project in Food, Nutrition and Dietetics	TP	2	3*	72	15	45
HFN 445	Nutrition Intervention, Programme Planning, Monitoring and Evaluation	T	3	40***	45	15	45
HFN 446	Nutrition Care Process and Therapy	PT	2	6**	126	15	45
HFN 447	Seminar in Food, Nutrition and Dietetics	T	3	-	45	15	45
HFN 448	Food Analysis	PT	2	3*	72	15	45
HFN 449	Nutrition Epidemiology	T	3	-	45	15	45
HFN 450	Food Safety Hygiene and Legislation	T	3	-	45	15	45
PT = Practicals T= Theory		*Laboratory practical per week; ** Health facility practical per week; *** Field work per semester					
Note:							
7. A Unit is defined as an equivalent of 1 lecture or 2 hours of tutorial or 3 hours practical. Each unit will be offered in 3 units per as a minimum.							
8. The following hours are included to fulfill the requirements of the practicum: Clinical practicum: 618 hours Community practicum: 800 hours							

Code	Unit Name	ID	Lecture hours per week	Practical hours	Total semester contact hours plus two hours exams	Total number of weeks	Total unit hours per semester
HFN 451	Nutrition Pharmacology	T	3	-	45	15	45
HFN 452	Leadership in Food Nutrition and Dietetics	T	3	-	45	15	45
HFN 453	Nutrition and Behaviour	T	3	-	45	15	45
HFN 454	Practicum II	PT		40**	480	15	480
	Total Number of Hours				4296		
PT = Practicals T= Theory			*Laboratory practical per week; ** Health facility practical per week; *** Field work per semester				
		<p>Note:</p> <p>9. A Unit is defined as an equivalent of 1 lecture or 2 hours of tutorial or 3 hours practical. Each unit will be offered in 3 units per as a minimum.</p> <p>10. The following hours are included to fulfill the requirements of the practicum: Clinical practicum: 618 hours Community practicum: 800 hours</p>					

COURSE DESCRIPTIONS

YEAR I, SEMESTER I

UCU 101: Development Studies

Concepts and theories of development and underdevelopment. Historical roots of African development and underdevelopment. Concept of Gender and rationale for mainstreaming gender. WID, WAD, and GAD approaches to development. Participatory development. Development strategies; indicators, problems and regional integration, population, resources and development, agriculture and rural development, urbanization and development, science, technology and development, law, justice, politics, and development, ethics, morality and development.

Course Objectives:

At the end of the course the learner should be able to;

- To interpret the concepts of development
- To analyze the essence of development in Africa
- To equip students with necessary skills to respond to development challenges and problems.
- To identify and explicate issues challenging the development processes in Africa.

References:

1. Haynes, J (2008). Development Studies. 1st edition. Policy Press.
2. UNDP – Human Development Reports
3. World Bank – World Development Reports

UCU 103: Introduction to Critical and Creative Thinking

Philosophy; nature, methods, relevance. Critical and Creative thinking; nature, characteristics and relevance. Tools of analysis and evaluation. Intellectual virtues. Reasoning skills and argument analysis; types of arguments and purpose of arguments. Fallacious reasoning. Creativity and innovation; essential elements of creativity and innovation, creative methods and techniques, obstacles to criticality and creativity. Decision making; procedures, skills, techniques and problem solving. Personal Identity; self-examination, personal development and transformation. Case studies and models of criticality, creativity and innovation in various areas of study.

Course Objectives:

The course attempts to enable students to:

- Understand themselves and take charge of their own thinking.
- Appreciate education as a process of transformation from a state of dependency to autonomy
- Think clearly, accurately, consistently and logically.
- Acquire appropriate decision making and problem solving skills.
- Think through content in various disciplines and contexts and make good judgment.

References:

1. Johnson, A. P (2005). Up and Out: Using Creative and Critical Thinking Skills to Enhance Learning
2. Namwambah T (2011). Essentials of Critical and Creative Thinking 2
3. Paul, R. and Linda, E. (2002), Critical Thinking: Tools for taking charge of your personal and professional life

SMA 102: Basic Mathematics

Trigonometry; Trigonometric functions, identities and equations, sine and cosine formula. Algebra; quadratic functions and methods of solving quadratic equations, surds, logarithms and indices. Remainder and factor Theorems and their applications. Series; arithmetic and geometric progressions, permutations and combinations. Binomial theorem and applications. Statistics; collection and representation of data, measures of central tendency and dispersion. Probability; additive and multiplicative laws of probability, compound events and conditional probabilities.

Course Objectives

By the end of this course the learners should be able to:

- Perform basic mathematical calculations.
- Apply appropriate mathematical skills in solving problems in nutrition and dietetics.
- Use appropriate statistical techniques to solve related problems in nutrition and dietetics.

References:

1. Barnett, R.A., Ziegler M.R. and Byleen K.E (2010). College Mathematics for Business, Economics, Life Sciences and Social Sciences. 12th ed. Barnett.
2. Gay M.E (2010). Basic College Mathematics. 4th Ed. Pearson.
3. Bittinger M.I (2005). Basic Mathematics. 10th Ed. Addison Wesley.
4. Tussy, A.S., Gustafson, R.D. and Koenig, D (2010) Basic Mathematics for College Students. 4th Ed. Cengage Learning.

HFN 141: Introduction to Food, Nutrition and Dietetics (NEW)

Introduction to food, nutrition and dietetics as a profession. History of nutrition and dietetics. Career opportunities, roles, responsibilities in the field of nutrition and dietetics for diploma holders. The relationships within the profession and interrelationships with other health professions. Contemporary issues in food, nutrition and dietetics. Food, nutrition and dietetics inter and intra professional relationships with other discipline.

Objectives:

By the end of the course the learner will be able to:

- Understand the field of food, nutrition and dietetics.
- Understand the history of nutrition
- Identify career opportunities available in the field of food, nutrition and dietetics.
- Learn the professional conduct of nutritionists and dieticians.

References:

1. Carpenter, K.J (2003). A short history of nutritional sciences: Part 1, 2 and 3. *American Journal of Nutritional Sciences*. 133:975-984;638-645;3023-3032.
2. Carpenter, E (2008). Understanding the Basics of Nutrition Book Surge Publishing
3. Tree .G (2013). Kick Start your Nutrition Career Essentials for Health; 1st ed

HFN 142: Physical and Inorganic chemistry (NEW)

Basic concepts in chemistry; Atomic structure and periodic table. Chemical bonding. The nucleus and radioactivity. Radiation chemistry. The chemical equations. Mole concept. Physical chemistry; energy, chemical equilibrium, rate of reaction, ionic equilibria. States of matter; gases, liquids and solids. Solutions; acids and bases. Phase equilibria; calorimetry, enthalpy of reactions, redox reactions and electro-chemistry. Colloidal properties. Practicals; 3 hours per week in a chemistry laboratory.

Course Objectives:

By the end of the course the learner should be able to;

- Explain basic structure and bonding of organic compounds
- Explain types of organic compounds and their reactions
- Carry out laboratory preparation of basic organic compounds
- Attain a general understanding of the basic principles of chemistry.
- Integrate the principles of chemistry into discussions of their practical applications in everyday life including the environment

References:

1. Atkins, P., Paula, J (2009). Physical Chemistry. 9th Ed.
2. Cotton A.F., Murillo, C.A. and Bochmann, M (2007). Advanced Inorganic Chemistry. 6th Ed. Wiley India Pvt Ltd.
3. Wulfsberg, G (2010). Inorganic Chemistry. Viva.
4. House, J. E. and House, J (2010). A descriptive inorganic chemistry. 2nd ed. Amsterdam Academic Press
5. Lee, J. D. (2010). Concise inorganic chemistry. 5th ed. Oxford ; Malden, MA : Blackwell Science.

HFN 143: First Aid (NEW)

Overview of first aid. Roles and responsibilities of a first aider. The first aid box. Principles of first aid. First aid situations; shock, loss of consciousness, drowning, difficulty in breathing, cuts, infected wounds, burns, broken bones, dislocations, strains and sprains, poisoning, bites and stings, constipation, stomach problems, emergency problems of the gut, appendicitis and peritonitis. Care of the sick; home based nutritional and psychological support. Link between hospital and home care. Post first aid care. Practicals; 3 hours per week in the skills laboratory.

Course objectives:

By the end of the course, the learner should be able to:

- Handle an emergency and monitor a conscious victim for life- and non life-threatening conditions.
- Prioritize care for life-threatening injuries or sudden illnesses.
- Manage different types of emergencies and injuries.
- Practice basic precautions to reduce the risk of disease transmission and control.

References:

1. Hubbard, J (2013). Living Ready Pocket Manual – First Aid: Fundamentals for survival Living Ready.
2. Tao, L. and Krause, K (2011). First Aid Basic Science , General Principles. 2nd Ed. McGraw-Hill Medical.

HFN 144: Macronutrients (NEW)

Carbohydrates, proteins, fats, alcohol and water; classification, chemical properties, structures, functions, dietary sources, Recommend Dietary Allowances (RDAs), Recommended Nutrient Intake (RNIs). Consequences of deficiencies; Signs, symptoms and management of deficiencies and Excesses and toxicities of nutrients. Nutrients; digestion, absorption and basic metabolism. Nutrient-nutrient interactions. Case studies.

Course objectives:

By the end of this course the learner should be able to:

- Define concepts and basic principles of carbohydrates, proteins, fats, water and alcohol.
- Describe the human dietary requirements of macro nutrients
- Describe deficiencies, excesses and toxicities associated with macronutrients.

References:

1. Eastwood, M (.2010). Principles of Human Nutrition. 2nd ed. Blackwell Publishing,
2. Gibney, M.J. and Lanham, S.A. (2009). Introduction to Human Nutrition. New Aedin Cassidy Hester H. Vorster. Eds. March (2009). 2nd ed. Wiley-Blackwell
3. Shanti G (2004) Nutrition and Child care A practical guide. 2nd Ed. New Delhi Jaypee

YEAR I, SEMESTER II

UCU 100: Communication Skills

Reading skills; skimming, scanning, intensive and critical reading, interpretation of non-verbal information, content tables and indices. Listening skills; in lectures, predicting structure of a lecture, understanding gist, recognizing change of topic and following tutorial discussions. Library skills; accessing library collections and utilizing library help services. Collecting and abstracting information; note-taking, note-making, classification and storage of information. Speaking skills; in tutorials, presenting a paper, seeking clarification and explanation, giving and justifying opinions and agreeing. Writing skills; analyzing tasks, planning, drafting and editing various types of writing, quoting and paraphrasing, indicating references, footnotes and bibliographies. Study techniques; planning work, organizing, storing and retrieving information, preparing for and writing examinations.

Course objectives:

By the end of this unit, the learner should be able to:

- Understand the importance of effective communication
- Comprehend the concepts and methods of effective communication
- Communicate effectively in a given situation
- Store and retrieve information
- Appreciate the barriers to communication

References

1. McKay M, Davis M, Fanning P (2009) Messages: The Communication Skills Book New Harbinger Publications; 3rd ed
2. Becker E.F, Wortmann J (2009) Mastering Communication at Work: How to Lead, Manage, and Influence McGraw-Hill; 1st ed
3. Liptak J.J Leutenberg E (2008) The Communication Skills Workbook Whole Person Associates, Inc; Spi edition

HFN 145: General Biology

Cell structure; cell theory, origin of life, structure, functions and distribution of cell organelles. Human tissue, organs and organs systems; skin, musculoskeletal, respiratory, reproductive, urinary, circulatory, digestive, nervous, endocrine, lymphatic and immune systems. Heredity; mendelian genetics, chromosomal basis and chemical basis of heredity.

Course objectives:

By the end of the course, students should be able to

- Outline the structure of the cell and cell organelles,
- Outline theories on the origin of life,
- Demonstrate a clear understanding of heredity and genetics
- Explain the organization and functions of biological structures such as cells, tissues, organs and systems,.

References:

1. James D. Mauseth (2014); Botany; An introduction to Plant Biology. John and Bartlett Learning Company. .
2. Roberts M, Reiss Micheal, R and Monger G. (2000). Advanced Biology. Publisher; Nelson Thornes
3. Relethfold J.H (2001) Genetics and the Search for Modern Human Origins Wiley-Liss; 1st ed

HFN 146: Nutrition in the Lifespan

Introduction to lifespan. Factors that determine individual's nutritional needs. Importance of preconception nutrition in men and women. Nutritional requirements and deficiency diseases in; pregnancy, lactation, infancy, early childhood, late childhood, adolescence, adulthood and old age. Obesity among young children. Non food based interventions to maternal nutrition. Emerging issues affecting nutrition in lifecycle; policy, eating habits, globalization and technology. Emphasis on nutrition needs of vulnerable groups; how to meet these needs and the challenges faced in meeting the needs in resource poor settings.

Course objectives:

By the end of the course the learner should be able to:

- Describe the factors that influence individual nutritional needs.
- Describe the nutrient needs during the different stages of the lifecycle.
- Explain the diseases associated with deficiencies during the various stages.
- Identify emerging issues affecting nutrition in the lifecycle.

References:

1. Judith E. Brown, Janet Isaacs, Bea Krinke, Ellen Lechtenberg and Maureen Murtaugh (2013). Nutrition in the lifecycle. 5th Edition. Cengage Learning
2. FAO/WHO (2002). Human Vitamin and Mineral Requirements. Report of a joint expert consultation Bangkok, Thailand World Health Organization Food and Agriculture Organization of The United Nations Rome.
3. SCN, (2005). Adolescence: A pivotal stage in the lifecycle. SCN News. Lavenham press United Kingdom.

4. Brown J E, Isaacs J., Krinke B, Lechtenber E (2013) Nutrition through the Life Cycle Cengage Learning; 5th ed
5. Sharlin J, Edelstein S (2010) Essentials Of Life Cycle Nutrition Jones & Bartlett Learning; 1st ed
6. Brown J E (2007) Nutrition through the Life Cycle Wadsworth Publishing; 3rd ed

HFN 147: Organic Chemistry

Functional group chemistry; hydrocarbons, alcohols, aldehydes, ketones, carboxylic acids, esters, thiols, phenols, ethers, amines and amides. Structure of biomolecules; amino acids, proteins, sugars and lipids. Chemistry related to characteristics and occurrence of nutrients and essential elements of diets. Functional group analysis and inter-conversions. Stereochemistry; nucleophilic substitution, elimination reactions and addition reactions. Tests for simple organic compounds. Practicals; 3 hours per week chemistry laboratory

Course objectives:

By the end of the course the learner should be able to:

1. Identify the main functional groups that constitute food nutrients, such as hydrocarbons, alcohols, alkylhalides, ketones, carboxylic acid, amines and amino acids.
2. Draw and name the general structures of basic organic compounds and their functional groups
3. Explain some reactions processes of the main functional groups
4. Identify the functional groups that make food nutrients-carbohydrates, proteins, vitamins, lipids.
5. Explain some characteristics of these food nutrients.

References:

1. McCurry J.E (2011) Organic Chemistry Cengage Learning; 8th ed
2. Smith M.B (2010) Organic Chemistry: An Acid - Base Approach CRC Press; 1st ed
3. Wade G.L (2012) Organic Chemistry Prentice Hall; 8th ed

HFN 148: Sociology For Food, Nutrition and Dietetics (NEW)

Methodologies used in sociological study. Study of structure and functions of society; social relationships, evolution of human society, social structure, status, role, family, group, community. Class value; socialization, purpose of social inquiry. Tools in sociology and the social science of inquiry. Relationship between sociology and social sciences. Sociology of eating; diet and culture, cultural evolution and change, nutrition in transition, ethnology and ethnography in the food, nutrition and dietetics context.

Course Objectives:

At the end of course the learner should be able to;

- Discuss the development of sociology as a science and differentiate it from the other social sciences.
- Explain the elements of a culture and how culture is influencing food and nutrition.
- Explain the relationships between social structure, social stratification, and the consequences of social status.
- Describe impact of nutrition in transition in nutrition situation
- Describe inequality and other social factors contribute to social change.

References:

1. Hughes, Michael and Carolyn L. Kroehler. (2008)*Sociology: the Core*, 8th edition, McGraw-Hill, 2008. ISBN: 007-0299636-6.
2. Macionis J.J.(2011) *Sociology* Pearson; 14th ed
3. Schaefer R.T (2012) *Sociology: A Brief Introduction* McGraw-Hill Humanities/Social Sciences/Languages; 10th ed

HFN 149: Micronutrients (NEW)

Vitamins and minerals; classification, requirements, chemical properties and structures, digestion, absorption and metabolism; interactions, dietary sources, Recommend Dietary allowances and Recommended Nutrition Intake. Signs, symptoms and management of deficiencies. Excesses and toxicities. Micronutrient supplements. Emerging issues in micronutrients and interventions.

Course objectives:

By the end of this course the learner should be able to:

- Define concepts and basic principles of vitamins and minerals.
- Describe the human dietary requirements of micro nutrients
- Describe deficiencies, excesses and toxicities associated with micronutrients.

References:

1. Eastwood M. (2010). *Principles of Human Nutrition*. 2nd ed. Blackwell Publishing,
2. Michael J. Gibney, S.A. Lanham, Cassidy A, Hester H. Vorster. E. (2009). *Introduction to Human Nutrition*, 2nd ed. Wiley-Blackwell
3. Shanti G (2004) *Nutrition and Child care A practical guide*(2nd Ed): New delhi Jaypee Publishers

HFN 150: Information and Communication Technology for Food, Nutrition and Dietetics (NEW)

Introduction. History and terminology used in computing. Operating systems; personal computer; major hardware/software components, files & folders and storage devices. Fundamentals of Microsoft windows. Software applications ; MS Word, MS Excel MS access, Ms Powerpoint, EPI info, SPSS, STATA, SAS, nutrisurvey, ENA for SMART. Internet applications. Special topics; Computers and society, security issues, viruses, use and misuse of computers. Computer languages, solving problems and creating applications. Role of Information technology in Nutrition. Practicals; 3 hours per week in a computer laboratory.

Course Objectives:

At the end of the course the learner should be able to;

- Be familiar with various computer applications
- Use relevant software related to nutrition
- Describe the role of information technology in nutrition.

References:

1. Brown Graham; Watson David (2010). *IGCSE Information and Communication Technology* Publisher: London Hodder Education, an Hachette UK Company 2010
2. James F. Clark (2008) *Computers and Information Processing Concepts and Applications* (1st Ed).South Western Publishers 0-538-60131-0
3. Kothari. C. R. (2006). *An Introduction to Operational Research* Vikas0-7069-8567-2

4. Webster, Frank (2006); Theories of the information society (3rd ed.). Publisher: London ; New York : Routledge, Online Access:
5. Webster, Frank (2006); Theories of the information society (3rd ed.). Publisher: London ; New York : Routledge, Online Access:

YEAR II, SEMESTER I

HFN 240: Foundations of Food Preparation

Introduction to food production. Definition of terms used in food and beverage production. Reason for cooking for invalids. Methods of cooking. Types of fuel used in food and beverage production. Selection, production and use of foods and their products for invalids. Poultry, eggs, milk, meat, fish, vegetables, fruits, cereals, legumes, nuts, fats and oils. Effect of heat on the nutritional value, flavour, texture and colour of food during preparation and cooking. Purchasing, preparation and cooking of various foods. Practicals; 3 hours a week in a food laboratory.

Course objectives:

By end of the course learners should have developed/acquired:

- Knowledge about basic principles of food preparation.
- Knowledge about properties of foods and their function in food preparation.
- Ability to utilize various properties of different foods in food preparation
- Ability to demonstrate skills in proper food handling, preparation, presentation and maintenance of high sanitation standards.

References:

1. Indrani (2008). *Nursing Manual Of Nutrition And Therapeutic Diet*. Jaypee Brothers Medical Publishers (p) Ltd. 8180611205
2. Dittmer, Paul (2003). *Principles of food, beverage, and labor cost controls*.(7th ed.) Publisher: New York; Chichester: Wiley.
3. Food and Beverage Service by Lillicrap, Dennis. Edition: 7th ed. Publisher: London Hodder Arnold 2006
4. Mary T, Becki V. (2005). *Cooking among friends: Meal planning and preparation delightfully simplified*. LLC. USA.

HFN 241: Human Nutrition

Definition of Nutrition. The science of nutrition. Nutrients in food; Composition and variation. The basics of interaction of nutrients and their metabolism; nutrient digestion, absorption, sources of nutrients, intake, regulation and energy metabolism. Natural and man made factors influencing nutrient utilization. Balanced diets; dietary recommendations and guidelines, origin and calculation of Recommended Dietary Allowances, Adequate Intakes, Recommended Nutrient Intake's, food composition tables, food pyramid and food plate. Tools used in recommendations of dietary guidelines and tools for planning meals. Non nutritive components of foods. Contemporary issues in nutrition.

Course Objectives:

By the end of the course, learners should be able to;

- Describe the chemical and physical structures as well as properties of nutrients.
- Explain the function of nutrients in the body.
- Describe digestion, absorption, assimilation and utilization of nutrients in the body.
- State the recommended daily allowances of various nutrients (RDA).

- Explain factors affecting nutrient requirements

References:

1. Michael J. G, Susan A. L, Cassidy N A, Hester H. Vorster. E. (2009). Introduction to Human Nutrition, Wiley-Blackwell 2nd ed
2. Shubhangini A. J (2010): Nutrition and Dietetics with Indian case studies. New Delhi. 3rd ed
3. Eastwood M. (2010). Principles of Human Nutrition. Blackwell Publishing, 2nd ed.

HFN 242: Food Microbiology and Parasitology I (RENAMED)

Historical background. General characteristics and classification of bacteria, microorganisms, fungi and viruses. Microbial growth patterns. Isolation and identification of bacteria, fungi and viruses. Microbial physiology and micro-organism as pathogens to man. Food-borne eukaryotic parasites. Helminthes, arthropods; morphology, classification, identification and life cycles of parasites and hosts/parasite relationships. Uses of micro-organism in food production, processing and preservation and introduction to food biotechnology. Practicals; 3 hours per week practical in a laboratory.

Course objectives:

By the end of this course the learner should be able to:-

- Explain the role and significance of micro-organisms and parasites in food.
- Describe the intrinsic and extrinsic parameters of foods that affect microbial growth.
- Culture, isolate and classify micro-organisms and parasites in food.

References

1. David Greenwood, Richard C. B. Slack, John F. Peutherer, Michael R. Barer. (2007). Medical Microbiology: A Guide to Microbial Infections: Pathogenesis, Immunity, Laboratory Diagnosis and Control. Elsevier Limited
2. Greenwood D. et al. 2002. *Medical microbiology*. 6th ed. Churchill Livingstone
3. Cowan M.K (2012) Microbiology Fundamentals: A Clinical Approach McGraw-Hill Science/Engineering/Math; 1st ed
4. Willey J , Sherwood L , Woolverton C (2008) Prescott's Principles of Microbiology McGraw-Hill Science/Engineering/Math; 1 edition
5. Montville J.L, Matthews K. R , Kniel K.E (2012 Food Microbiology: An Introduction ASM Press; 3rd ed

HFN 243: Nutrition and HIV and AIDs

Relationship between Nutrition and HIV/AIDs, Nutrition and effects during different stages of HIV and AIDS progression. Breastfeeding recommendations for HIV and AIDS mothers. Nutrition effects and implications for HIV and AIDS in different physiological states. Nutrition in maintenance of the immune system. Use of Anti Retro Viral drugs and Food Supplements for HIV/AIDs positive persons.

Course objectives:

By the end of this course, students should be able to:

- Describe relationship between nutrition and HIV/AIDs
- Describe the aims of nutritional care and support for PLWHAs
- Describe the link between HIV/AIDs and food security as well as effective nutritional care in food insecurity situations

- Outline nutritional care and support in different physiological states i.e. pregnancy, lactation and adolescents
- Explain nutrient ARVs/drug interactions

References:

1. HIV/AIDS.(2004) A guide for Nutrition care and support.FANTA
2. PMTCT (2004) Training Manual
3. Kenya National Guidelines on Nutrition and HIV/AIDS 2006
4. GOK, (2008) Nutrition Training Manual
5. Anderson J.L (2014) HIV and AIDS: Symptoms, Testing, Treatment, Risk Factors, Preventions, Nutrition, Marriage, Having Children, Legal Issues Create Space Independent Publishing Platform
6. Pribram V (2010) Nutrition and HIV Wiley-Blackwell; 1st ed

HFN 244: Primary Health Care (NEW)

Definition of Primary Health Care (PHC). Goal of PHC. Key elements of PHC. Origin, organization, strategies, implementation, achievements and constraints. Alma Ata Declaration. Approaches of PHC. Financing and reforms in PHC; community strategy, Community Based Health Care (CBHC) and World Health Organization's goal of health for all. Millennium Development Goals (MDGs). Community resource persons/volunteers roles and training; Community Health Workers (CHWs) and Community Health Extension Workers(CHEWs). Community-based health services; Bamako Initiative and community-based distribution of contraceptives. Child health; the aims and principles of Extended Programme of Immunization (EPI), cold chain management, the preventable childhood diseases, the vaccines, the national immunization schedule, the Integrated Management of Childhood Illnesses (IMCI) concept and application, Integrated Management of Acute Malnutrition (IMAM), Prevention of Mother to Child Transmission (PMCT) and Baby Friendly Hospital Initiatives (BFHI). Roles of traditional health. Case studies of PHC implementation; Kenya, Uganda, Tanzania, South Africa, Nigeria and Ghana. Field trips; students should be exposed to 40 practical hours hands on experience in primary health care in a health facility.

Course objectives:

By the end of this course unit, the learner should be able to:

- Explain the concept of primary health care.
- Apply PHC knowledge and skills in nutrition and dietetics
- Plan, implement and evaluate community projects or programmes

References:

1. Scutchfield F.D, Keck W Principles of Public Health Practice, Cengage Learning; 3rd ed
2. Kaufman M (2006) Nutrition in Promoting the Public's Health: Strategies, Principles, and Practice Jones & Bartlett Learning; 1st ed
3. M.L, Teutsch S.M, Thacker S.B, (2010) Principles and Practice of Public Health Surveillance Oxford University Press; 3 edition

HFN 245: Human Anatomy

Introduction to the human body; surface anatomy, body cavities, directional anatomy and anatomical positions/planes and their importance in clinical nutrition. A gross and microscopic

anatomy of human cell and tissues: Systems; integumentary, muscular, nervous, skeletal, digestive and its accessory organs, respiratory, circulatory, lymphatic, endocrine, urinary and reproductive. Anatomy of the sense organs; the human eye, ear, nose and the tongue. Practicals; 3 hours per week in a human anatomy laboratory.

Course objectives

By the end of the course the learner should be able to;

- Define human anatomy.
- Identify, draw and describe the cell as the basic building block of the body.
- Identify different organs and body systems.
- Explain the main functions of different organs and organ systems.

References:

1. Valerie C. S., Tina S. (2003). Essentials of anatomy and physiology. Philadelphia: F.A. Davis Company.
2. Frank H. N, Hansen J.T (2002). Atlas of human anatomy. 3rd ed. ICON Learning Systems
3. Marieb E.N and Hoehn K(2012) Human Anatomy & Physiology Pearson; 9th ed
4. Page M. (2001) Human Body: An Illustrated Guide to Every Part of the Human Body and How It Works DK ADULT; 1st ed.
5. Martini F.H, Nath J.L Bartholomew E.W (2011) Fundamentals of Anatomy & Physiology Benjamin Cummings (9th Edition

HFN 246: Nutrition Assessment

Determinants of malnutrition and emerging issues. Need and users of nutrition assessment. Principles of nutritional assessment. Assessment techniques; anthropometry, biochemical, clinical and dietary. Non-nutritional assessment techniques. Environmental and socio-economic determinants. Procedures used in identifying individuals and groups at risk. Planning a nutrition survey. Field trips; 40 hours per semester of planning and conducting nutrition assessment in the community.

Course objectives:

At the end of the course, the learner should be able to;

- Define concepts in nutritional assessment.
- State the common nutritional problems and describe their causes.
- Explain the uses of the assessment of nutritional status of individuals and groups.
- Describe the types of assessment methods, the advantages, disadvantages and limitations.
- Plan and conduct a nutrition survey in a community

References:

1. Gibson R.S (2005) Principles of Nutritional Assessment Oxford University Press; 2nd ed
2. Charney. P, Malone A.M, (2004) ADA Pocket Guide to Nutrition Assessment Amer Dietetic Assn; 2nd ed
3. Lee. R, Nieman D, (2012) Nutritional Assessment McGraw-Hill Science/Engineering/Math; 6th ed
4. Bruce C. (2003). Anthropometric Indicators Measurements Guide. Food and Nutrition Technical Assistance. Project Academy for Educational Development. Washington DC.

YEAR II, SEMESTER II

HFN 247: Nutrition Anthropology

Sociology of food and nutrition; evolutionary and behavioral. Social and cultural perspectives in nutrition; food taboos, cultural notions, personhood, kinship, sharing and morality. Human behaviour in food acquisition; preparation and consumption. Clinical and social significance of the human diet and nutrition. Anthropological methodologies in nutritional studies; social cultural processes and nutrition, cultural and ideational systems, Physiological adaptation, population genetics, and nutrition, Applied research for nutrition programs. Evolutionary perspectives on human diet; biological plasticity, human growth and development, hunter gatherer nutrition, social factors that determine the patterns of nutrition diseases within and across population. The politics of food. Field trips; 40 hours per semesters, 5 hours per week of nutrition anthropology projects in the community.

Course objectives:

By the end of the course, learners should be able to:

- Describe the role of culture as a diet determinant
- Describe nutritional behaviour and practices of the different cultures
- Discuss various food taboos and social factors that influence lifestyle diseases
- Demonstrate ability to influence eating habits in different cultures

References:

1. Antony R. P. (2007). The science of social influence, advances and future progress. Psychology Press
2. Gerd B., Michaela W. and Gert B. 2002. Attitudes and Attitude Change. Psychology Press.
3. Antony R. P. (2007). The science of social influence, advances and future progress. Psychology Press
4. Dufour D.L , Goodman A.H, Pelto G.H 2012 Nutritional Anthropology: Biocultural Perspectives on Food and Nutrition Oxford University Press; 2nd ed
5. Scott S, Duncan C.J (2002) Demography and Nutrition: Evidence from Historical and Contemporary Populations Wiley-Blackwell

HFN 248: Meal Planning, Management and Services

Introduction to meal planning. Economic, aesthetic, nutritional and managerial considerations in meal planning and service. Kitchen management and equipment for meal preparation production, service and food storage. Food and beverage service and etiquette. Introduction to food service; the service area, table appointments and methods of service. Introduction to the food pyramid and food exchange list. Meal planning for the family, special groups, institutions and special occasions. Practicals; 3 hour per week sessions in a food laboratory.

Course objectives:

By the end of the course the learner should be able to:

- Describe the processes of food selection, preparation and service in different situations.
- Plan meals for different age groups
- Describe the stages in menu planning, implementation for institutional settings.

References:

1. Hope S. W (2010). Diabetes meal planning made easy. American diabetes association. 4th ed. Alexandria, Virginia.
2. Mary T. Becki V. (2005). Cooking among friends: Meal planning and preparation delightfully simplified. Cooking Among Friends, LLC.
3. Sacket L, Pestka J, Gisslen W (2010) Professional Garde Manger: A Comprehensive Guide to Cold Food Preparation Wiley; 1st ed
4. Indrani (2008). *Nursing Manual Of Nutrition And Therapeutic Diet*. Jaypee Brothers Medical Publishers (p) Ltd. 8180611205
5. Dittmer, Paul (2003). *Principles of food, beverage, and labor cost controls*.(7th ed.) Publisher: New York ; Chichester : Wiley.
6. Food and Beverage Service by Lillicrap, Dennis. Edition: 7th ed. Publisher: London Hodder Arnold 2006
7. Mary T,Becki V. (2005). *Cooking among friends: Meal planning and preparation delightfully simplified*. LLC. USA.

HFN 249: Nutrition and Psychology (NEW)

Basic principles of human psychology; psychosexual development stages, social development theories of personality, personality structure, personality disorders. Learning and motivation; perception and attention, thinking and decision making. Abnormal behaviour. Behaviorism; classical conditioning, operant conditioning. Psychoanalytic factors and health, psychological disorders; anxiety and mood disorders, dissociative and somatoform disorders, schizophrenia and personality disorders.

Course Objectives

At the end of the course the learner should be able to;

- Explain the basic principles of human psychology
- Explain the personality theories structure and disorder
- Discuss the psychological disorders
- Explain how psychological disorders affect nutritional status

References:

1. Antony R. P. (2007). *The Science of Social Influence. Advances and future progress*. Psychology Press
2. Gerd B., Michaela W., Gert B. (2002.) *Attitudes and Attitude Change*. Psychology Press
3. Adrian Furnham (2005). *The Psychology of Behaviour at Work* (2nd Ed). Psychology Press
4. Joseph P. F. (2006). *Affect in Social Thinking and Behaviour*. Psychology Press..
5. Paula M. N., Silvia K. & Francois R. (2006). *Psychology of Emotions*. Psychology Press

HFN 250: Nutrition and Disease Management I (NEW)

Introduction to immunology; synergy of nutrition and infections. Nutrition management of selected communicable diseases. Acute and chronic febrile disorders; malaria, typhoid, tuberculosis, HIV and AIDS, GIT diseases; diarrhoea, constipation and peptic ulcers. Hepatic diseases, renal disease, musculoskeletal diseases and neuromuscular diseases. Food allergies.

Field trips; 6 hour weekly visits to a health facility for hands on management of diseases listed above.

Course Objectives:

At the end of the course the learner should be able to;

- Explain the nutrition implication of the various diseases
- Discuss the pathophysiology of diseases
- Explain the nutrition management of the various diseases
- Describe how to formulate a diet for patient for various diseases

References :

1. Antia F P (2009). Clinical Dietetics And Nutrition. Oxford University Press, 0195664159
2. Colbin, Annemarie (1986), Food and healing.(1st ed.): New York : Ballantine Books
3. Dudek, Susan G. (2010), Nutrition Essential for Nursing Practice (6th Edition): Philadelphia Wolters Kluwer
4. GOK (2010). Clinical reference manual. GOK
5. Howard H., Mason Herbert Swift Carter., Paul E. Howe, (2007). Nutrition And Clinical Dietetics, Kessinger Publishing,1432509489
6. Kabiru M. , Njenga .A, (2010). Health, Nutrition and Care Nairobi Focus Publishers
7. Mordue R.E. (1992) Household Food Consumption and Expenditure 1991. Annual Report of the National Food Survey Committee London HMSO Publications Centre.

HFN 251: Life Skills (NEW)

Health relationships. Communication and effective interpersonal skills. Foundations for health lifestyles and nutrition. Awareness of and appreciation for human diversity. Gender stereotypes. Self esteem and assertiveness. Personal responsibility and accountability. Respectful and ethical behaviors. Personal money/resource management plan. Time management techniques. Positive health and wellness behaviors. Sexual exploitation, rape and gender violence. Effective coping skills for managing stress. Signs and symptoms of emotional ill health, suicide, and depression in self and others and management techniques. Effective anger and conflict resolution strategies. Employability skills. Practicals; 3 hours per week in the skill laboratory.

Course objectives:

By the end of this course the learner should be able to,

- Demonstrate understanding of the life skills principles and techniques
- Apply life skill education in leadership and management
- Apply life skill education in entrepreneurship

References:

1. Pestalozzi T (2013) Life Skills 101: A Practical Guide to Leaving Home and Living on Your Own Stone wood Publications; Updated 5th ed
2. Leutenberg E.A Liptak J.J Edward D (2009) The Practical Life Skills Workbook Whole Person Associates, Inc; Spi Wkb edition
3. Williams P, Thomas J.L (2005) Total Life Coaching: 50+ Life Lessons, Skills, and Techniques to Enhance Your Practice . . . and Your Life W. W. Norton & Company

HFN 252: Human Physiology

Introduction to functions of the human body structures and the associated pathophysiology of the organs. Parameters and the devices used in measurement of the physiology of the organs.

Physiologic levels of human body organization, human development and inheritance. Physiology of the human cell and tissue; the skin, muscles, skeletal system, joints and associated pathophysiology. Physiology of the nervous system; the brain, spinal cord, peripheral nervous system and the neurotransmissions across the brain and the visceral organs/receptors/sensory organ and the neuromuscular junction. Physiology of the endocrine system and neuroendocrine control of body homeostasis and personality/behavior patterns. Physiology of cardiovascular, lymphatic, respiratory, digestive, urinary and the reproductive system. Exercise physiology and the aging process. Practicals; 3 hours per week practical in a human physiology laboratory.

Course Objectives:

- Describe functional organization of the human body
- Discuss how physiological systems function and how they are coordinated for overall functioning of the body
- Describe principles of neurology and fundamentals of brain structure
- Discuss reproductive and exercise physiology
- Discuss approaches in measurement of physiological parameter

References:

1. Frank H. Netter, John T. Hansen. (2002). *Atlas of Human Anatomy* (Third Edition): ICON Learning Systems
2. Martin R. Terry. (2000). *Human anatomy and physiology.*(2nd ed). Dubuque, Iowa WMC. Brown
3. Martin Terry R. (2003). *Essential of human anatomy and physiology laboratory manual* (8th Edition). Boston Burr Ridge The McGraw-Hill Companies
4. Stuart Ira Fox (2011). *Human physiology* (12th ed). New York : McGraw-Hill
5. Tortora, Gerard J; Derrickson, Bryan; Tortora, Gerard J (2009), *Principles of anatomy and physiology* (12th ed). Publisher: Hoboken N.J. John Wiley & Sons

HFN 253: Nutrition Surveillance

Principles of nutrition surveillance. Nutrition assessment methods, their analysis and interpretation. Surveillance techniques for quantitative and qualitative methods. Criteria for sentinel site selection. Values and limitations, methods of monitoring household food security and development of early warning systems. Theory and methodology for surveillance and system planning. Field trip; 40 hours per semester of conducting nutrition surveillance in a community setting.

Course Objectives:

- Discuss the importance of nutrition surveillance
- Describe methods of carrying out nutrition surveillance
- Explain the various surveillance systems

Reference:

1. FSAU (2005), Nutrition guide to data collection, interpretation analysis and use, FSAU for Somalia
2. Ministry of Health and Sanitation (2008) Guidelines for Nutrition Assessments in Kenya. Kenya National Bureau of Statistics., GoK
3. B. Cogill (2001), Anthropometric indicators measurement guide, FANTA
4. Boyle M.A, Holben D.H, (2012) Community Nutrition in Action: An Entrepreneurial Approach Cengage Learning; 6th ed

YEAR III, SEMESTER I

HCU 300: Introduction to Research Methods

Introduction to research methods. Importance of research in food, nutrition and dietetics. Meaning, purpose and types of research. Qualitative and quantitative approaches. Proposal development process; topic and title development, background information, statement of the problem, objectives and hypotheses, review of literature, research design, sample size determination and sampling techniques, data collection tools and procedures, research protocol and ethics. Referencing. Basic methods of data analysis and interpretations. Project; writing a proposal and presentation.

Course Objectives:

At the end of the course, the learner will be able to:

- Define research and state the characteristics and tools of research
- Explain the application of quantitative and qualitative methodologies in research
- Describe the components of a research proposal
- Write research proposal

References:

1. Orodho J. A. (2000): Techniques of Writing Research Proposals and Reports in Education and Social Sciences
2. Browne L. B. (2007). Research based evidence supporting food and nutrition. 2nd ed.
3. Steven B. H., Warren S.B., et al. 2007. Designing clinical research. Lippincott Williams & Wilkins.
4. Kumar R (2010) Research Methodology: A Step-by-Step Guide for Beginners SAGE Publications Ltd; Third Edition

HFN 341: Maternal and Child Nutrition

Nutrition monitoring during pre conception period, maternal care, pregnancy and lactation. Infant and young child feeding practices. Growth monitoring and promotion, special nutritional needs at various stages of growth and development, pregnancy and lactation. Micronutrient supplementation, immunizations, infant feeding in the context of HIV and AIDS. WHO nutrition protocols for infant feeding and breastfeeding codes. Government policies on infant nutrition.

Course Objectives:

At the end of the course the learner should be able to;

- Explain nutritional requirements during pre-conception period, pregnancy and lactation.
- Explain infant feeding and Breastfeeding codes.
- Describe the importance of growth monitoring for children.
- Describe intervention programmes for mother and child

References:

1. Shanti G (2004), Nutrition and Child care a practical guide. New Delhi Jaypee Publishers
2nd ed

2. Bridget S, Tracey A (2002) Eating expectantly: a practical and tasty guide to parental nutrition 3rd ed London Vermilion
3. UNICEF, WHO, Ministry of Health, Nutrition Division(2006) Baby Friendly Hospital Initiative, Revised, Updated and Expanded for Integrated Care (CD and Manuals) UNICEF, WHO
4. Somer E, (2002) Nutrition for a Healthy Pregnancy, Revised Edition: The Complete Guide to Eating Before, during, and After Your Pregnancy Holt Paperbacks; Revised edition

HFN 342: Nutrition and Sports

Basic principles in nutrition and sports. Muscle physiology and energy requirements in sports. Role of the diet in various sports. Ergogenic aids. Role and functions of specified vitamins and minerals in relation to exercise. Pre-exercise and post exercise nutrition. Nutrition therapy in sports injuries. Case studies and model prescriptions.

Course Objectives:

At the end of the course the learner should be able to;

- Describe the relationship between nutritional demands and physical activity
- Determine caloric and fluid needs for performance
- Prescribe optimal nutrition for health, exercise and sport for various populations
- Describe eating disorders among sports persons.
- Describe use and abuse of ergogenic aids and nutritional supplements

References:

1. Ira Wolinsky, Judy A. Driskell (2007). Sports Nutrition: Energy Metabolism And Exercise, Taylor & Francis Group
2. Lori A. Smolin, Mary B. Grosvenor (2010). Nutrition For Sports And Exercise Chelsea House Publications
3. William D. Mcardle, Frank I. Katch, Victor L. Katch(2008). Sports And Exercise Nutrition.Lippincott Williams & Wilkins

HFN 343: Entrepreneurship in Nutrition

Entrepreneurship theories and models. Entrepreneurship, culture and small business. Role of entrepreneurship to economic growth. Types of business in Food, Nutrition and Dietetics. The entrepreneurship process. Identification of business opportunities. Product development strategies. Constrains of Small and Medium Enterprises (SMEs). Corporate entrepreneurship. Financing options for SMEs. Managing an existing business; the managerial functions, financial management and personnel management. Development of a business plan.

Course Objectives:

At the end of the course the learner should be able to

- Demonstrate positive attitudes towards self-employment.
- Develop a business plan for a business.
- State the factors liable to affect the success of a business.
- Portray desire to venture into a business.
- Apply entrepreneurial competencies in business situations
- Acquire management skills necessary for running a successful enterprise.

References:

1. Kurako,D.F, Hodgets R.M (2003). Entrepreneurship: Theory Process and Practice.Thomson, south Western Publishing Co.
2. Dullinger M.J. (2002). Entrepreneurship Strategy and Resources: Prentice Hall
3. Hisrich R. D., Peters M. P, Shepherd D. A. (2007). Entrepreneurship. 6th ed. New Delhi:Tata, McGraw Hill
4. Drucker P.F (2006) Innovation and Entrepreneurship Harper Business; Reprint edition
5. Madura J (2010) Introduction to Business Paradigm Pub Intl; 5th ed

HFN 344: Food Microbiology and Parasitology II (RENAMED)

Control of microbial growth in foods. Destruction of microorganisms. Indicator microorganisms. Food spoilage, examples of specific foods and food products; meat, fish, milk, eggs, cereals, legumes, nuts, spices and salads. Microbial standards and testing. Food borne illnesses; food poisoning, food infection and food intoxication. Pathogenesis, clinical signs, diagnosis, treatment and control of parasites of importance to food safety. Zoonosis, taeniasis, cystercercosis, hydatidosis, trichinosis, ascaris and schistosomiasis. One field trip to food industries and microbiology laboratories. Practicals; 3 hours per week in a food microbiology laboratory practicals

Course Objectives:

At the end of the course the learner should be able to;

- Explain the classification of food related micro-organisms
- Explain the characteristics of food related micro-organisms
- Describe the role of micro-organism in food production, processing and preservation
- Discuss the effects of parasites on the nutrition status

References:

1. Greenwood, D & et al. (2002). Medical Microbiology, (6th edn.), Churchill Livingstone
2. Ray, Bibek. (2007). Fundamentals of microbiology (4th ed.) Publisher: Boca Raton CRC press
3. Roberts, Larry S; Janovy, John; Schmidt, Gerald D (2000). .Foundations of parasitology (6th ed.) Publisher: Boston: McGraw-Hill Higher Education

HFN 345: Nutrition and Disease Management II (NEW)

Examining the interrelationships of physiology, biochemistry and nutrition as related to medical nutrition therapy. Eating disorders. Non communicable diseases; diabetes mellitus, cardiovascular disorders, weight disorders, burns and trauma, surgical, hepatic, biliary diseases and cancer. Field Visits; 6 hour weekly visits to a health facility for hands on management of diseases listed above.

Course Objectives:

At the end of the course the learner should be able to

- Explain the nutrition implication of the various diseases
- Discuss the pathophysiology of diseases
- Explain the nutrition management of the various diseases
- Describe how to formulate a diet for patient with various conditions.

- To understand the etiology and symptoms of specific infectious and organ-system diseases
- To understand the metabolic changes and nutritional implications of the specific infectious and organ-system diseases
- To understand the role of nutrition in the management of specific infectious and organ-system diseases

References:

1. Antia F P (2009). Clinical Dietetics And Nutrition. Oxford University Press, 0195664159
2. Dudek, Susan G. (2010), Nutrition Essential for Nursing Practice (6th Edition): Philadelphia Wolters Kluwer
3. GOK (2010). Clinical reference manual. GOK
4. Howard H., Mason Herbert Swift Carter., Paul E. Howe, (2007). Nutrition And Clinical Dietetics, Kessinger Publishing,1432509489
5. Kabiru M. , Njenga .A, (2010). Health, Nutrition and Care Nairobi Focus Publishers

HFN 346: Nutrition Counseling

Roles and qualities for the Nutrition Counselor. Sources of information for the nutrition Counselor. Theories of understanding and influencing nutrition behavior. Nutrition counseling tools and techniques ‘The How’. The counseling process/steps; rapport, assessment, diagnosis, counseling and follow up at individual and group levels. Counseling at cross-cultural and multi-cultural settings, dietary habits that require change at individual, household, community and institutional levels. National and international nutrition counseling guidelines. Counseling in different disease conditions. Role plays. Case studies. Skill laboratory practicals; 6 hours per week of nutrition counseling to a client.

Course objectives:

By the end of this course the learner should be able to:

- Explain the meaning, purpose of nutrition counseling with key issues in planning a counseling session
- Understand the roles and qualities of a nutrition counselor
- Describe different techniques that are used in nutrition counseling and elements of quality nutrition to nutrition counseling
- Design nutrition counseling plans for at risk groups
- Discuss dietary practices and habits that require change at individual, household, and community /institutional level

References:

1. Klawitter B, king K, (2007) Nutrition Therapy: Advanced Counseling LWW; 3rd ed
2. Beto J.A, Holli B, (2012) Nutrition Counseling and Education Skills for Dietetics Professionals LWW; Sixth, None edition
3. Sokolik C.A, Bauer K.D, (2001) Basic Nutrition Counseling Skill Development Cengage Learning; 1st ed

YEAR III, SEMESTER II

HFN 347: Biostatistics in Nutrition (NEW)

Introduction to biostatistics, uses of biostatistics, variables and scales of measurements. Presentation of data; bar charts, pie charts, histograms. Descriptive statistics; frequency distribution curves, averages, means, weighed means, median, dispersion, standard deviation, measure of central tendency and dispersion. Probability and normal distributions. Estimation and hypothesis testing. Probability testing; test of significance confidence intervals, difference intervals, difference between means, univariate and multivariate analysis, parametric and non-parametric tests. Inferential statistics; t-tests, chi-square tests, analysis of variance and covariance, regression and correlation. Measurements to test strengths of association between exposure and outcome variables. ODDS ratios and relative risks. Elementary data analysis using nutrition analysis packages (ENA for SMART, EPI INFO, NUTRISURVEY) and interpretation and application of biostatistics.

Course Objectives;

At the end of the course the learner will be expected to;

- Calculate various measures of central tendency and variability of data
- Carry out simple parametric and non-parametric tests
- Correlate independent and dependent variables using Spearman and Pearson's correlate coefficients.
- Use statistical method to obtain regression equation for the best line of fit.
- Use statistical methods and packages to analyze nutritional data.

References:

1. Fritz J.T, Sincich T. (2000) Statistics, , Prentice Hall 8th ed
2. Gupta C.B, Gupta V, (2001) An Introduction to Statistical Methods, Vikas Publishing House PVT Ltd.
3. Kuzma. J, Bohnenblust. S, (2004) Basic Statistics for the Health Sciences McGraw-Hill Humanities/Social Sciences/Languages; 5th ed

HFN 348: Analytical Chemistry

Solutions and pH. Titrimetric analysis; acid-base, complex-metric, conductometric and non-aqueous titrations. Applications in food quality control. Gravimetric analysis. Instrumental methods of analysis; flame photometry, atomic absorption spectrophotometry, fluorimetry, nuclear magnetic resonance, magnetic resonance imaging and separative techniques; gas chromatographic techniques, Thin Layer Chromatography, Higher Performance Liquid Chromatography and Gas Chromatography-Mass Spectrophotometry. Practicals; 3 hours per week in a chemistry laboratory.

Course Objectives:

At the end of the course the learner should be able to;

- Appreciate analytical chemistry for qualitative and quantitative analysis of samples

- Understand various analytical techniques for determination of metals using atomic spectroscopy and x-ray methods, determination of concentration of acids/bases using titrimetric methods and separation of sample mixture by gas chromatography.
- Apply knowledge of instrumental and chemical analytical methods for the analysis of sample.

Reference:

1. Christian G.D, Dasgupta p.s, Schug K (2013) Analytical Chemistry Wiley; 7th ed
2. Skoog D.A, Holler F.J, Crouch S.T (2007) Instrumental Analysis Cengage Learning; 6th ed.

HFN 349: Nutrition Education

Role of a nutrition educator. The role of other stakeholders in nutrition education. Theories and learning domains in nutrition and health education. Approaches used in nutrition education. Nutrition education in pedagogy and andragogy. Designing and development of nutrition education messages; choice of audience, content, teaching and learning methods, aids and resources. Channels of communicating nutrition education messages. Potential of nutrition education in addressing malnutrition; case studies of successful nutrition education interventions. Steps in planning nutrition education programmes. Nutrition advocacy. Community participation in nutrition education activities. Monitoring and evaluating nutrition education programmes. Community mobilization and sensitization. Field trips; 40 hours per semester of conducting nutrition education to a target audience in community or health facility setting.

Course objectives:

At the end of the course, the student should be able to:

- Discuss the aims of nutrition education and the role of a nutrition educator
- Enumerate the main problems and potentials of nutrition education
- Describe the various approaches used in nutritional education
- Assess the value of different nutrition education messages, media and materials
- Discuss the role of stakeholders in provision of nutrition education

References:

1. Tones K, Tilford S, (2001) Health Promotion: Effectiveness, Efficiency and Equity Cengage Learning; 3rd ed
2. Nutrition Education Series, Issues 16 and 10 UNESCO Publications.
3. Contento (2011) Nutrition Education 2nd Edition Jones and Bartlett Publishers, Inc; 2nd ed
4. Pattanaik A (2004) Nutrition Education APH Publishing Corporation

HFN 350: Food Biotechnology (NEW)

Definitions and concepts. Biotechnology and traditionally fermented foods. Contribution of modern biotechnology to the improvement of traditional fermented foods. Enzymes in food processing and new product development. Impact of biotechnology on food flavour and colour in food industries. Plant biotechnology and genetically modified foods; meat quality improvements through biotechnology applications, biotechnology regulation and food safety. Social and ethical issues in biotechnology. Field trip to a food industry. Practicals; 3 hours per week in a food microbiology laboratory.

Course Objectives:

At the end of the course the learner should be able to;

- Explain the concept of biotechnology
- Describe how microorganisms can be genetically modified
- Apply biotechnological techniques in food production and fermentation processes,
- Analyse the current status and future prospects of food biotechnology

References:

1. Perry J. (2002) Introduction to food biotechnology– Green. Publisher; CRC press
2. Raymond W.A, Encarta, (2006) Biotechnology, Microsoft Corporation 2005. CD
3. Frazier, W.C Westhoff D.C (1998) Food Microbiology 4th edition. Tata MC Graw – Hill Delhi p 382.ISBN 0-07-021921-4 pl

HFN 351: Nutrition Biochemistry

Structure and bio-chemistry of the cell. Enzymes and their classification. Thermodynamics in biochemical transformations. Biochemistry of macromolecules. Structure and function of carbohydrates, proteins, lipids and nucleic acids. Nutrient metabolism; carbohydrates, fats and fatty acids and proteins. Amino acids degradation and the urea cycle. Integration of metabolism. Biochemistry of muscle and motile systems. Biochemical assessment of micronutrients. Practicals; 3 hours per week in a chemistry laboratory.

Course objectives:

At the end of the unit, the learner should be able to:

- Explain the metabolic processes that follow digestion and absorption of simple sugars, amino acids, free fatty acids, and cholesterol.
- Explain the metabolic functions of vitamins and minerals obtained from foods.
- Explain enzymatic and non-enzymatic browning and oxidation of foods – meat, fish, vegetables, fruits and milk
- Explain the principle of fermentation and malting processes.
- Explain the importance of pigments and colours in foods

References:

1. Mehas K,Rodgers S, McGraw- hill Education (2005) Food Science: The Biochemistry of Food & Nutrition, Student Edition Glencoe/McGraw-Hill; 5th ed
2. Lehninger A.L (.2007). Principles of Biochemistry.. New York: Worth Publishers 1st ed
3. Chatterjea M.N and Shinde R (2002) Medical Biochemistry. New Dehli, India: Jaypee Brothers Publishers. 8th ed.
4. Harvey R.A, Ferrier D.R, (2010) Biochemistry (Lippincott's Illustrated Reviews Series) LWW; 5th ed

HFN 352: Therapeutic Dietetics

Definition of terms. Biochemical role of diet in human nutrition. Principles of diet therapy. Biochemical levels of important nutritional indicators. Therapeutic diets; normal diet and modified diets. Roles of nutritionists and dietitians. The care process; phases of the care process. Drug–nutrient interaction; Nutritional supplements, functional foods and nutraceuticals. Enteral and parenteral nutrition. Nutritional therapy in diseases of infancy and childhood. Hospitalized children, LBW infants, failure to thrive, colic, functional infant vomiting, constipation, diarrhea,

cleft lip and palate. Malabsorption problems; inborn errors of metabolism, lactose intolerance and food allergies. Gastrointestinal diseases and disorders. Management of underweight, overweight and obesity. Field trips; 6 hours per week, exposure to therapeutic dietetics practicals in a health facility setting.

Course Objectives:

At the end of the course the learner should be able to;

- Explain the principles of diet therapy.
- Describe types of diet modification used in patient care.
- Explain the application of different modes of feeding

Reference:

1. Antia F P (2009). Clinical Dietetics And Nutrition. Oxford University Press, 0195664159
2. Duyff Roberta (2000), Nutrition & wellness. New york McGraw-Hill
3. Herbert Swift Carter, Paul Edward Howe, Howard Harris Mason (2010). Nutrition And Clinical Dietetics: Nabu Press, 1147383588
4. Howard H. Mason, Herbert Swift Carter, Paul E. Howe (2007), Nutrition And Clinical Dietetics. Kessinger Publishing, 1432509489
5. Kabiru M., Njenga A. (2010). Health, Nutrition and Care. Nairobi Focus Publishers
6. Saxena (2007). Therapeutic Nutrition. Pointer Publishers 817910219X
7. Springhouse Corporation (2002). Fluids & electrolytes made incredibly easy. (2nd Ed.) Publisher: Springhouse, Pa.: Springhouse
8. Lisa Hark, Gail Morrison (2003), Medical Nutrition & Disease: A Case-Based Approach. Blackwell Publishers, 0632046589

HFN 353: Practicum I

Supervised practical experience in medical facility settings (or) organizations dealing with community nutrition (or) food industries to gain hands-on experience in the relevant areas for a period of 3 months after completion of units up to third year level. Maintenance of a daily record of activities in the student diary and submission of a report at the end of practicum. Evaluation by external supervisor using the departmental evaluation form during practicum and submission of the marks to the department. Diary and practicum report marking by departmental lecturers upon completion and award of marks to the unit.

Course objectives:

By the end of the course, the learner should be able to:

- Write a report on ones experience in the institution or organization of attachment.
- Demonstrate use of nutrition and dietetic skills in the place of attachment.
- Identify problems and intervention for discussion with the management of the organization or facility.
- Document lessons learnt from the field attachment exercise.

Reference

1. Jungers C.M, Scott J (2008) Practicum and Internship: Textbook and Resource Guide for Counseling and Psychotherapy Routledge; 4 edition
2. Hodges S (2010) The Counseling Practicum and Internship Manual: A Resource for Graduate Counseling Students Springer Publishing Company; 1st ed

3. Baird B (2007) Internship, Practicum, and Field Placement Handbook: A Guide for the Helping Professions Prentice Hall; 5th ed

YEAR IV, SEMESTER I

HFN 440: Food and Nutrition Security

Concepts and definitions. Groups at risk of food insecurity. Prevalence and severity of food and nutrition insecurity at individual, household, community and national levels. Population and world food supplies. Determinants of food security. Food chain in production through to consumption. Food security problems in rural and urban settings. Agricultural planning and economic development. Early warning systems. Food Policy issues and planning of interventions. Role of NGOs and bilateral agencies in food security. Food security assessment. Field trips; 40 hours per week of conducting food and nutrition security projects/surveys.

Course objectives:

By the end of the course, the learner should be able to;

- Describe the dimensions of food security
- Discuss the Sustainable Livelihood Framework by DFID/IFAD.
- Describe the food chain.
- Describe the methods of determining/measuring/assessing food and nutrition security and agricultural planning
- Discuss problems related to food security such as HIV/AIDS, gender issues, rural and urban food and nutrition security
- Discuss the early warning systems, nutrition policy issues, planning and interventions.

References:

1. FANTA/USAID (2006) Household Dietary Diversity Score (HDDS) for measurement of Household Food Access: Indicator Guide VERSION 2
2. FANTA/USAID (2007) Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide VERSION 3 August 2007
3. FANTA/USAID (2007) Months of Adequate Household Food Provisioning (MAHFP) for Measurement of Household Food Access: Indicator Guide. June 2007

HFN 441: Principles of Food Processing, Preservation and Storage

Diversity and quality of food materials. Quality of raw food materials. Deterioration of foods; causes, effects and control. Processing and preservation techniques: energy input; heat, irradiation, microwaves, pressure. Temperature reduction; chilling and freezing. Water removal; concentration, evaporative drying and freeze drying. Biological methods; acid and alcohol fermentation and malting. Chemical methods; additives and smoking. Nutrient loss and process optimization. Packaging and storage. Practicals; 3 hours per week in a food processing laboratory.

Course Objectives:

By the end of the course learner should be able to:

- Explain the principles of food processing and preservation
- Describe the effects of the processing methods on the sensorial and nutritional quality of foods

- Describe appropriate storage conditions for different classes of foods

References:

1. Doona C.J, Kustin K, Feeherry F.E (2010). Case Studies in Novel Food Processing Technologies: Innovations in Processing, Packaging, and Predictive Modelling Woodhead Publishing. 1st ed
2. Karel M, Lund D.B (2003) Physical Principles of Food Preservation: Revised and Expanded. CRC Press. 2nd ed
3. Rahman M S (2007) Handbook of Food Preservation, Second Edition. CRC Press; 2nd ed.

HFN 442: Nutrition in Emergencies

Types of emergency situation. Assessment of nutrition status in emergencies; Lot Quality Assurance Survey (LQAS) and Standardized Monitoring ART methodology in conducting nutrition surveys. Nutrition interventions in emergency situation; CTC programme planning, implementation, monitoring and evaluation. Human rights approaches to emergencies, cultural dynamics and gender issues. Principles of humanitarian assistance. SPHERE standards. Vulnerable groups; Disaster preparedness plan. Challenges in the management of a crises situation. Current developments in nutrition in emergencies. Field trips; 40 hours per semesters of exposure to an emergency setting.

Course Objectives:

At the end of the course, the learner will be able to:

- Describe the types and effect of emergencies on nutrition and health
- Discuss the issues of nutrition and public health concerns during an emergency
- Discuss the various nutrition interventions under taken during an emergency
- Understand the role of the various stakeholders and community participation in emergency
- Explain how to monitor and evaluate nutrition responses

References:

1. UNICEF (2005). Emergency Field Book. Division of communication,
2. SPHERE project 2004. Humanitarian Charter and Minimum Standards in Disaster
3. United Nations (2008). Kenya Emergency Humanitarian Response plan.
4. SPHERE Project 2004: Humanitarian Charter and Minimum Standards in disaster

HFN 443: Food Chemistry (NEW)

Introduction to chemical components of food; water and water activity, carbohydrates, lipids, proteins, vitamins and minerals, pigments and colorants. Enzymes. Chemical and biochemical changes and mechanism of reactions of the components of fresh and processed foods; enzymatic and non-enzymatic browning, oxidation, fermentation and malting. Methods of controlling and inhibiting non-enzymatic browning. Nature of food ingredients and their functions. Food pigments, colours and flavours. Nutrient analysis. Practicals; 3 hours per week in a food chemistry laboratory.

Course Objectives:

By the end of this course learner should be able to:

- Describe the relationship between the chemical composition of food its chemical, physical and sensory properties
- To identify the chemical structure of food components including fats, proteins, amino acids, carbohydrates and vitamins to understand how structure determines functional behaviour of these food components with respect to food quality, nutrition and safety.
- To explain how temperature, pH, ionic strength, type of bonds, aw affect chemical changes in food systems and how to adjust these conditions to improve or minimize chemical and biochemical deterioration of food systems.
- To compare and contrast food processing operations on the chemical changes of food components as they relate to food quality, nutrient composition and safety.

References:

1. Damodaran and others. 2008. Fennema's Food Chemistry 4th ed. Boca Raton CRC Press.
2. Fennema's Parkin, Damodaran (2008) Food Chemistry, 4th edition
3. Hui H.Y (2007) Food Chemistry: Principles and Applications Science Technology System; 2nd edition

HFN 444: Project in Food, Nutrition and Dietetics

Proposal development in a selected topic in the areas of food, nutrition and dietetics. Data collection on the proposed topic, data analysis report writing and presentation. Proposal development and data collection

Course Objectives:

By the end of this unit, students shall be able to:

- Describe the process of identifying research projects in nutrition.
- Describe data collection strategies for projects
- Describe proposal components as applied in different project proposals
- Write a proposal, conduct a research (data collection) analyze data and present results

References:

1. WFP report on project implementation, 2000
2. Tocci S, Conklin G.B, Gardener R (2009) Ace Your Exercise and Nutrition Science Project: Great Science Fair Ideas (Ace Your Biology Science Project) Enslow Publishers
3. Insel P, Bernstein M, Ross D, McMahon K (2013) Nutrition Jones & Bartlett Learning; 5 edition
4. Orodho J. A. (2000): Techniques of Writing Research Proposals and Reports in Education and Social Sciences
5. Browne L. B. (2007). Research based evidence supporting food and nutrition. 2nd ed.
6. Steven B. H., Warren S.B., et al. 2007. Designing clinical research. Lippincott Williams & Wilkins.
7. Kumar R (2010) Research Methodology: A Step-by-Step Guide for Beginners SAGE Publications Ltd; Third Edition

HFN 445: Nutrition Intervention, Programme Planning, Monitoring and Evaluation (RENAMED)

Programme life cycle. Quantitative and qualitative participatory approaches to community problem identification and analysis. Types of community problems and community needs. Types of nutritional intervention programmes (merits and demerits). Development of intervention programme action plan. Importance of collaboration and community participation in intervention programmes. Targeting and selection of intervention beneficiaries. Nutrition intervention programme monitoring and evaluation. Field trips; 40 hours per semester exposure to nutrition programmes/projects.

Course objectives:

At the end of the course the learner should be able to;

- Describe the different types of interventions and their appropriateness in different situations
- Discuss the criteria for selecting nutrition intervention programmes
- Construct the tools used in planning and evaluation of interventions
- Analyse case studies of successful interventions

References:

1. Lefevre,P, Kolsteren P, Wael M.P, Byekwaso F, Beghin. I, (2000). Comprehensive Participatory Planning and Evaluation. Antwerp: Nutrition Unit of Institute of Tropical Medicine.
2. Scientific Affairs and Research (2006) Nutrition Diagnosis and Intervention: Standardized Language for the Nutrition Care Process. American Dietetic Association; 1st ed.
3. Green J, Tones K,(2010) Health Promotion: Planning and Strategies SAGE Publications Ltd; 2nded

HFN 446: Nutrition Care Process and Therapy (NEW)

Introduction to nutrition therapy. Role of dieticians and other health professionals in therapeutic care process. Application of the principles of dietetics. Nutrition care algorithms, steps in the nutrition care process. Practical standard operating procedures. Steps in nutrition care process; assessment, diagnosis, nutrition intervention, nutrition monitoring and evaluation. Design and implementation of nutrition care strategies; evaluation of client response and progress. Field trip; 6 hours per week practical exposure to steps of nutrition care process in a health facility setting.

Course Objectives:

At the end of the course the learner should be able to;

- Describe nutrition therapy and its role in the management of diseases
- Describe the nutritional care processes.
- Describe the implementation, monitoring and evaluation of nutrition care process

References:

1. Kabiru, M.; Njenga A. (2010). Health, Nutrition and Care Nairobi Focus Publishers
2. Teutsch S.M, Thacker S.B, (2010) Principles and Practice of Public Health Surveillance Oxford University Press; 3 edition
3. Scientific Affairs and Research (2006) Nutrition Diagnosis and Intervention: Standardized Language for the Nutrition Care Process. American Dietetic Association; 1st ed.

4. Lefevre,P, Kolsteren P, Wael M.P, Byekwaso F, Beghin. I, (2000). Comprehensive Participatory Planning and Evaluation. Antwerp: Nutrition Unit of Institute of Tropical Medicine.
5. Green J, Tones K,(2010) Health Promotion: Planning and Strategies SAGE Publications Ltd; 2nded

YEAR IV, SEMESTER II

HFN 447: Seminars in Food, Nutrition and Dietetics

Analysis of contemporary global issues in food, nutrition and dietetics. Literature search, critiquing research articles, discussion and presentation skill. Written research seminar reports. Evaluation is by 100% continuous assessment.

Course objectives:

At the end of the course learner should be able to:

- Discuss the current issues in foods, nutrition and dietetics
- Critique papers and presentations
- Write academic papers and present them in a classroom setting.
- Explain factors involved in planning and organizing for workshops and seminars

References:

1. Oshima A, Hogue A (2006) Introduction to Academic Writing (The Longman Academic writing series Pearson Longman; 3rd edition
2. Fundamentals of Academic Writing (The Longman Academic Writing Series, Level 1(2007) Pearson Longman; Linda Butler edition
3. Rebeck T (2012)Seminar Samuel French, Inc

HFN 448: Food Analysis

Instrumental and biophysical techniques in food analysis. Standard methods for assay of food components; protein, carbohydrates, lipids, vitamin and minerals and enzyme assay. Practical application of chromatographic, calorimetric, fluorimetric and spectrophotometric methods. Nuclear magnetic and resonance imaging. Analytical standards. Specifications for food analysis. Practicals; 3 hours per week in a food chemistry laboratory.

Course objective:

At the end of the course the learner should be able to:

- Be able to analyze various food products.
- Describe the basic principles of analytical procedures and techniques commonly used to provide information about the chemical composition, structure and physical properties of food materials.
- Be able to perform food analysis experiments, analyzing data and reporting their findings.

References:

1. Nielsen S.S (2010) Food Analysis Laboratory Manual (Food Science Text Series) Springer; 2nd ed.
2. Nollet M.L Toldra F (2012) Food Analysis by HPLC CRC Press; 3 edition
3. Pomeranz Y, Meloan C.E (2002) Food Analysis: Theory and Practice .Springer; 3rd edition

HFN 449: Nutritional Epidemiology

Epidemiological terminologies. Types of studies design in epidemiology. Distribution and determinants of nutritional related disorders. Measuring exposure outcomes; diet-disease associations, Interpretation of association. Nutritional surveillance; disease outbreak, notification, progression and prevention. Morbidity and mortality patterns. Epidemiological data and use. Disease causal models, role of host factors; age, sex and ethnicity. Agent factors; nutrients, microorganisms, pollutants, environmental, social, economic and cultural factors in disease occurrence. Population screening, validity and reliability of screening tests. Epidemiological study designs. Ethical and professional issues. Collection of data for programme evaluation and decision making.

Course objectives:

At the end of the course the learner will be able to;

- Define epidemiology and epidemiological concepts
- Explain the cause of malnutrition and other diseases
- Calculate different rates of mortality and morbidity
- Discuss the different epidemiological models
- Apply epidemiology to the study and practice of nutrition related fields

References:

1. Willet W. (2012) Nutrition Epidemiology ; Monographs in Epidemiology and Biostatistics. Oxford University Press. 3rd Ed
2. Rotham K J, Greenland S, Modern (2008) Epidemiology Lippincott Williams & Wilkins; 3rd ed .
3. Woodward M (2013) Epidemiology: Study Design and Data Analysis, Chapman and Hall/CRC. 3rd Ed.

HFN 450: Food Safety, Hygiene and Legislation

Principles of industrial food production. Types of food hazards. Potential hazards along the food supply chain. Hazard analysis; Hazard Analysis Critical Control Points, Safety Standard Operating Procedures . International and national food standards ;Food and Drug Administration, CODEX alimentariums. ISO 9000 series; ISO 22000, ISO 8000 and ISO 14000. Public health, legislation in relation to the consumer and food industries. Emphasis on food hygiene at institutional level. Public Health Act. Foods, Drugs and chemical substances Act.

Course objectives:

At the end of the course the learner should be able to;

- Define different concepts as used in food hygiene safety and legislation.
- Explain the typical growth curve of microorganisms in food
- Explain Hazard Analysis Critical Control Point
- Differentiate food standards from food laws
- Apply principles of good manufacturing practices in institutional management

References:

1. Michael P. Doyle L, Beuchat R, Montville T.J, (2001). Food Microbiology: Fundamentals and Frontiers American Society for Microbiology, New York. 2nd edition
2. UNIDO, (2003). Guideline on How to Develop HACCP in Food Processing Industries. First Draft, Addis Ababa, Ethiopia.
3. Satin M (2008). Food Alert: The Ultimate Sourcebook for Food Safety 2nd ed. Facts on File, Inc.
4. Mark C. (2008). Food Industry Quality Control Systems. CRC Press
5. Forsythe S. J., Hayes P. R. (2000). Food Hygiene Microbiology and HACCP 3rd ed. Aspen Publication Inc.

HFN 451: Nutrition Pharmacology (NEW)

Nutrient–drug interactions; effect of nutrients on drugs and effect of drugs on nutrients. Cardiovascular pharmacology; anti-hypertensive, diuretics and anti-angina agents. Endocrine pharmacology, gastro-intestinal and pulmonary pharmacology; anti-asthmatic agents, anti-microbial and chemotherapy. Resistance, development and mechanisms for anti-microbial resistance. Drugs for treatment of tuberculosis; anti-parasitic agents, anti-protozoa and anti-helminthes. Anti-viral agents, anti-retrovirals and cancer chemotherapy.

Course Objectives:

On completion of this subject students will be able to:

- To identify the common drugs used in pharmacotherapy in the health facilities
- Demonstrate the understanding of common food, nutrient and drug interaction in human
- Demonstrate the understanding of the corrective measures and alternative methods available for drug, food and nutrient interactions
- Be familiar with drugs that treat various conditions

References:

1. Katsung, B.G (2009). Basic and clinical pharmacology. 11th Ed.
2. Rang, H.P (2007). Pharmacology. 7th Ed.
3. Bennet, P (2008). Clinical pharmacology. 10th Ed.

HFN: 452 Leadership and Policy in Food, Nutrition and Dietetics (NEW)

Leadership skills, styles and types. Philosophy and ethics related to leadership and professional practice. Leadership traits, competencies and qualities of effective leaders, functions of a leader. Behavioural and situational approaches to leadership. Management and leadership. Alternative leadership styles. Action-centred leadership. Vision and work life of leaders. Leaders and decision-making. Professional competencies needed for career entry and advancement in nutrition and dietetics. An overview of appropriate means of delivery of professional services for a variety of needs. Professional behavior and ethics. Academic integrity and principles of professional practice. Successful professionals, qualities and characteristics. National and international food and nutrition policies. Emerging legal and policy issues in nutrition, steps in policy formulation process and relationship between policy and practice.

Course Objectives:

By the end of the course the students should be able to;

- Identify appropriate indicators to use for food, nutrition and policy planning.
- The students should also be able to analyze food and nutrition policies in Kenya.

- Describe the steps in policy formulation processes in the area of food nutrition and dietetics.
- Describe different leadership styles that can be applied in the management of nutritional programmes.

References:

1. GOK, (2008). The Kenya Technical Guidelines for micronutrient Deficiency Control. Ministry of Public Health and Sanitation. Government Printer Nairobi Kenya
2. GOK, (2004). Policy guidelines on micronutrient deficiency control in Kenya. National Micronutrient Deficiency Control Council (NMDCC) Task Force. UNICEF and Egerton University.
3. Iannotti, L. and Gillespie, S. (2002). Successful community nutrition programming lessons from Kenya, Tanzania and Uganda. (LINKAGES). Academy for Education Development (AED), Washington, D.C.
4. GOK, (2003). Economic Recovery Strategy for Wealth Recovery and Employment Creation (2003-2007) Government Printer Nairobi Kenya

HFN 453: Nutrition and behavior (NEW)

Introduction to nutrition behavior. Concepts and models in nutrition and behavior. Research methods and analytical strategies. Direct effect of nutrition and behavior; brain behavior connections, short term effects of nutrition of nutrition and behavior: neurotransmitters. Effects of chronic and acute forms of under nutrition; B vitamins, the central nervous system and behavior; minerals, central nervous system and behavior; dietary supplements, mental performance and behavior; bio-behavioral and psychosocial influence on nutrition; dietary sugar and behavior; caffeine, the methylxanthines and behavior; alcohol, brain functioning and behavior; eating disorder syndrome: anorexia bulimia nervosa; behavioral aspects of overweight and obesity.

Course Objectives:

At the end of the course, the students should be able to:

- Describe the effects of nutrition on behavior
- Describe the effects of nutrient deficiencies on behavior
- Identify nutritional disorders that cause behavior changes

References

1. Gill T (2014) Managing and Preventing obesity: Behavioural Factors and Dietary Interventions Woodhead Publishing Series.
2. O’neal P.W (2007) Motivation of Health Behaviour Nova series 1st ed.
3. Cooper J.O, Heron T.E, Heward W.L (2007) Applied Behaviour Analysis Pearson; 2 ed

HFN 454: Practicum II

Supervised practical experience in medical facility settings (or) organizations dealing with community nutrition to gain hands-on experience in the relevant areas for a period of 3 months. Upon completion of all the course units before graduation. Maintenance of a daily record of activities in the student diary and submission of a report at the end of practicum. Evaluation by external supervisor using the departmental evaluation form during practicum and submission of

the marks to the department. Diary and practicum report marking by departmental lecturers upon completion and award of marks to the unit.

Course objectives:

By the end of the course, the learner should be able to:

- Write a report on ones experience in the institution or organization of attachment.
- Demonstrate use of nutrition and dietetic skills in the place of attachment.
- Conduct a situational analysis in regard nutrition and dietetics management at the assigned organization or health facility
- Identify problems and intervention for discussion with the management of the organization or facility.
- Document lessons learnt from the field attachment exercise.

References:

1. Jungers C.M, Scott J (2008) Practicum and Internship: Textbook and Resource Guide for Counseling and Psychotherapy Routledge; 4 edition
2. Hodges S (2010) The Counseling Practicum and Internship Manual: A Resource for Graduate Counseling Students Springer Publishing Company; 1st ed
3. Baird B (2007) Internship, Practicum, and Field Placement Handbook: A Guide for the Helping Professions Prentice Hall; 5th ed