GREAT LAKES UNIVERSITY OF KISUMU (GLUK)

REGULATIONS AND CURRICULUM

FOR THE

POST GRADUATE DIPLOMA

IN

COMMUNITY NUTRITION

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1. GENERAL INFORMATION

Introduction

The Great Lakes University of Kisumu (GLUK) is a product of Tropical Institute of Community Health and Development (TICH) in Africa, a non profit community based training, research and development trust which has been operating since 1998. The main aim of GLUK is to develop effective managers of health and development initiatives in the African Region and beyond. This is achieved by bridging training with service delivery programmes, focusing on the needs of the most vulnerable communities in the society. It develops tests and disseminates hands-on innovative and effective models of development through action research. GLUK brings together regional and international academicians, professionals and practitioners in community health and development of diverse background to pool their skills, expertise and experience in addressing issues of livelihood for action and policy development. The educational experience at the University is enriched by the diversity of the student body. The students are a heterogeneous group, from different parts of Africa and beyond. They range in age and experience from recent high school to college graduate to mid-career managers.

1.1. Vision and Mission of the University

1.1.1. **Vision:** The Great Lakes University of Kisumu (GLUK) is established as a centre of excellence bridging academics with community and institutional based development.

1.1.2. **Mission:** The Mission of GLUK is to develop effective and concerned managers or leaders with a vision for the transformation of situations in the African context.

1.2. Philosophy of the University: GLUK believes that all people and communities have capacities and are fully engaged in individual, collective and collaborative actions to solve their own problems.

1.3. University Admission Requirements:

1.3.1. An applicant must satisfy any of the following minimum requirements:

1.3.1.1. Be a holder of Bachelor of Science Degree in Food Science, Bachelor of Science Degree in Hotel and Institutional Management, Bachelor of Education in Home Economics, Bachelor of Science in

Home Science and technology or professional certificate in a relevant discipline from an institution recognized by the Senate of GLUK.

1.3.2. Be a holder of any other qualification accepted by the senate of the University as equivalent to any of the above.

1.3.3. Procedure for Admission

1.3.3.1. Application for admission to the University shall be made to the Academic Registrar, Great Lakes University of Kisumu, P.O. Box 2224-40100, Kisumu, Kenya, Email: academics@gluk.ac.ke Telephone: 254 57 2023972/2024871, Fax: 254-57-2024577, Website: www.gluk.ac.ke

1.3.3.2. The closing date for receiving applications shall be determined by the Senate.

1.3.3.3. Application shall be accompanied by two coloured passport photos, copies of certified academic and professional certificates, a letter of recommendation and financial assurance from the candidate's supervisor, employers, or sponsoring agent.

1.4. Academic Resources

1.4.1. Facilities and Equipments

1.4.1.1. **Lecture Rooms:** The University has adequate lecture rooms which are well equipped with chairs, tables and white boards.

1.4.1.2. **Library:** The Great Lakes University of Kisumu (GLUK) library is fairly well stocked with relevant and appropriate textbooks, reference books and journals. GLUK also subscribes to various CD ROM data bases for research purposes and literature, and other health and development related abstracts. The library has installed internet facilities accessible to teaching staff and students.

1.4.1.3. **Information and Communication Technology:** The University's computing service provides services for word processing and extracting pertinent information from international data bases. The computing or e-centre also offers training courses for undergraduate and postgraduate studies.

1.4.1.4. **Laboratories:** GLUK has computer laboratories for computer lessons and a well equipped science laboratory for practical.

1.4.1.5. **Workshops and Studios:** The University has standard workshops that are used for practical training of students in various practical courses.

1.4.1.6. **Tuition Farms:** The University holds a farm in the main campus at Kibos, where courses related to farming receive demonstration lessons.

1.4.2. Academic Staff: The University has adequate number of employed permanent and part time professional teaching staff who all meets the minimum academic qualifications for teaching in any University in Kenya.

1.5. Programmes Offered by the University

1.5.1. List of Programmes:

1.5.1.1. Masters in Community Health and Development

1.5.1.2. Masters in Agribusiness

1.5.1.3. Masters in Theology

1.5.1.4. Bachelor of Science in Nursing

1.5.1.5. Bachelor of Science in Agribusiness

1.5.1.6. Bachelor of Theology

1.5.1.7. Bachelors of Science in Community Health and Development

1.5.1.8. Bachelors of Science in Community Nutrition

1.5.1.9. Bachelors in Education (Secondary option)

1.5.1.10. Higher Diploma in Community Health and Development

1.5.1.11. Diploma in Community Health and Development

1.5.1.12. Diploma in Clinical Medicine

1.5.1.13. Diploma in Information Technology

1.5.1.14. Diploma in Pastoral Theology

1.5.1.15. Diploma in Community Nutrition

1.5.2. Duration of Programmes:

1.5.2.1. Masters in Community Health and Development, Agribusiness and Theology shall extend over a period of not more than two academic years for full time students or four years for part time students.

1.5.2.2. Bachelor of Science in Nursing shall be four academic years for holders of KCSE or equivalent.

1.5.2.3. Bachelor of Science in Agribusiness shall be four academic years for holders of KCSE or equivalent.

1.5.2.4. Bachelor of Theology shall be four academic years for holders of KCSE or equivalent.

1.5.2.5. Bachelor of Science in Comunity Health and Development shall be four academic years for holders of KCSE or equivalent.

1.5.2.6. Bachelor of Science in Community Nutrition shall be four academic years for holders of KCSE or equivalent.

1.5.2.7. Bachelor of Education shall be four academic years for holders of KCSE or equivalent.

1.5.2.8. Higher Diploma in Community Health and Development is reserved for those with relevant post-basic training of two years. Therefore, the duration of the Higher Diploma in Community Health and Development shall be one academic year.

1.5.2.9. Diploma in Community Health and Development shall be two academic years.

1.5.2.10. Diploma in Clinical Medicine shall be three academic years.

1.5.2.11. Diploma in Information Technology shall be two academic years.

1.5.2.12. Diploma in Pastoral Theology shall be two academic years.

1.5.2.13. Diploma in Community Nutrition shall be two academic years.

1.5.2.14. Certificate courses shall be one academic year.

1.5.3. General Structure of Programmes:

1.5.3.1. Students shall be offered an approved combination of core, elective and common courses.

1.5.3.2. Core courses must be taken by every student in own discipline in order to qualify for the award of a degree, diploma or certificate.

1.5.3.3. Elective courses for Master's students cater for students' professional needs and interests in their areas of specialization.

1.5.3.4. Common courses build student capacity to understand their areas of specialization.

1.5.3.5. Each student shall take not more than seven courses per semester.

1.5.4. Academic Organization of Programmes: An academic year is equivalent to two semesters. A semester is made up of 15 weeks, which constitute 14 weeks of teaching and one week of University examinations. The program

will be in the Tropical Institute of Community Heath and Development offered by the Department of Community Nutrition.

2. CURRICULUM FOR THE POST GRADUATE DIPLOMA IN COMMUNITY NUTRITION

2.1. Title of the Programme: Post Graduate Diploma (PGD) in Community Nutrition

2.2. Philosophy of the Programme: The nutrition status of a population is a measure of well-being and economic progress. The intricate interactions between nutrition and disease, especially HIV/AIDS calls for more concerted effort to position nutrition at the right place, both nationally and globally. There is need to develop more capacity in the area of nutrition and food security in Kenya and Africa as a whole.

2.3. Justification of the Programme: The proposed Post Graduate Diploma programme in Community Nutrition is designed to create a critical mass of individuals with practical skills in the area of community nutrition with specific hands-on abilities in nutritional interventions, nutritional assessments, and current issues in community nutrition, therapeutic nutrition, food safety and hygiene and nutrition-disease interactions.

2.4. Goal of the Programme: The course aims at equipping students with working knowledge of human nutrition, food science and food security at the post graduate level. The programme is designed to enable graduates to practice hands-on nutrition practice in health and research institutions and to be able to solve community-based nutritional problems. The course is further designed to prepare students for higher degrees.

2.5. Expected Learning Outcomes of the Programme: By the end of the programme, the student should be able to:

2.5.1. Demonstrate knowledge in nature and role of food in human nutrition.

2.5.2. Manage human health through the intricate interactions of nutrition and disease.

2.5.3. Create employment and income generation through designing, implementation and monitoring of nutrition projects targeting achievement of Millennium Development Goals.

2.5.4. Increase food production and improving quality of food by creating innovative measures through proposal bids by skills acquired from Food and Nutrition Policy option

2.5.5. Eliminate hunger, malnutrition and ill health in the communities through establishment of partnerships with stakeholders as per skills acquired in Public Health Nutrition option

2.6. Mode of Delivery of the Programme: The mode of delivery of the programme will be :

a) Full time classes: Mondays through Friday

b) Part time classes: Saturdays and Sundays

c) Open Learning Mode: Through distance learning whereby the students will report on the first week and get the modules, they come on last week for tutorials for the modules and sit for written exams. CATS will be offered and submitted through the semester.

2.7. Academic Regulations for the Programme

2.7.1. Admission Requirements for the Programme

2.7.1.1. Be a holder of Bachelor of Science Degree in Food Science, Bachelor of Science Degree in Hotel and Institutional Management, Bachelor of Education in Home Economics, Bachelor of Science in Home Science and technology or professional certificate in a relevant discipline from an institution recognized by the Senate of GLUK.

2.7.1.2. Be a holder of any other qualification accepted by the senate of the University as equivalent to any of the above.

2.7.2. Course Requirements

2.7.2.1. The teaching of the post graduate diploma programme shall extend for two semesters.

2.7.2.2. The above duration of study shall consist of 15 weeks of study per semester.

2.7.2.3. Each student shall take a relevant Community Nutrition field project in the second semester.

2.7.2.4. All candidates shall be required to register and fully participate in 200 hours on chosen and relevant Community Nutrition field project during most of the semesters. The report will be graded out of 100% based on recommendations of the Department and that of

supervisors, where verbal presentation will account for 20% and written report for 80%.

2.7.2.5. All students shall rate a minimum of twelve (6) course units each semester.

2.7.2.6. No candidate shall be allowed to proceed to the second semester unless he/ she have obtained a pass mark in the first semester.

2.7.3. Student Assessment Policy

2.7.3.1. Continuous Assessment will be carried out throughout the semester and will constitute 30% of the total marks.

2.7.3.2. Semester Examination: Each student shall be required to take an end of semester examination. This shall constitute 70% of the total mark for each course.

2.7.3.3. Community field project: Each student will be required to conduct research and write a research report.

2.7.3.4. For course units that do not have sit-in examinations, evaluation shall be through oral presentations (20% of the marks) and written well-edited report (80% of the marks).

2.7.4. Grading System: The academic work of the students shall be graded and reported at the end of each semester. The semester grade reports shall list all courses and levels of performance as follows:

Marks (%)	**Letter Grade**
70%-100%	A
60% -69%	B
50% -59%	C
40% -49%	D
Below 40%	F

2.7.5. Examination Regulations: There shall be three types of examinations, namely: ordinary, supplementary and special examinations.

2.7.5.1. **Ordinary examinations**: All courses shall be examined at the end of the semester in which they are taken.

2.7.5.2. **Supplementary examinations:** A student who fails end of semester examinations shall re-sit the examination(s) when next on. The highest mark for an exam retake will be 40%. In the student's final year of study, the dean of faculty may exercise his/her discretion and grant supplementary examinations to finalists.

2.7.5.3. **Special examinations:** Candidates who are unable to do end of semester examinations due to acceptable evidence-based unavoidable circumstances may on the recommendation of Departmental Examination Boards to the Faculty Examination Board and Senate be allowed to take special examinations. Special examinations are marked and graded like ordinary examinations and candidates who fail are eligible to sit for supplementary examinations as outlined under supplementary legibility clause.

2.7.5.4. **Pass Mark:** The pass mark is 40% for all Post Graduate Diploma in Community Nutrition.

2.7.5.5. **Repeating:**

2.7.5.5.1. A candidate who fails in any of the units offered in the ordinary examinations taken in any one year will be required to repeat the failed units before being allowed to continue.

2.7.5.5.2. If a candidate fails supplementary examinations, he or she shall be required to repeat and pass the failed units before being allowed to proceed to the next stage of study.

2.7.5.5.3. Candidate shall only be allowed to repeat courses once a year.

2.7.5.6. **Discontinuing:** This shall apply to students who shall have committed gross misconduct of cheating in examination.

2.7.5.7. **Disciplinary Action:** Students involved in an examination irregularity shall appear before the departmental disciplinary committee for necessary action.

2.7.5.8. **Mode of Appeal** In all examinations, dissatisfied students can apply for a re-mark which shall be done by an independent examiner. Discontinued students and others who are dissatisfied with the decision of the disciplinary committee action can appeal to the senate.

2.7.5.9. **Examination Schedule:**

Paper Code		Title	Duration/Method of Examinations Written
1. NUT	111	Human Nutrition I	1x3hr
2. NUT	112	Therapeutic Nutrition and Dietetics 1	1x3hr
3. NUT	113	Nutrition Care and Assessment through the Life Cycle	1x3hr
4. NUT	114	Nutritional Epidemiology	1x3hr
5. NUT	115	Applied human nutrition and community surveillance	1x3hr
6. NUT	116	Current issues in food and nutrition	1x3hr
7. NUT	117	Partnership Practice I (Community Diagnosis)	0
8. NUT	121	Therapeutic Nutrition and Dietetics II	1x3hr
9. NUT	122	Human Nutrition II	1x3hr
10. NUT	123	Geriatric Nutrition	1x3hr
11. NUT	124	Nutrition Education and Intervention in the Community	1x3hr
12. NUT	125	Research Project in Nutrition	1x3hr
13. NUT	126	Nutritional counselling	1x3hr
14. NUT	127	Partnership 11 (Community Nutrition Interventions)	0

2.7.6. Moderation of Examinations:

2.7.6.1. All end-of-semester examinations shall be set by internal examiners and moderated by peers within the department.

2.7.6.2. The University on the advice of the department will appoint the external examiners to moderate the end of semester examinations.

2.7.6.3. The internal examiner shall be the chief invigilator during the examination and must be present at the time of examination.

2.7.6.4. The internal examiners shall be responsible for marking his/ her examination and processing of the marks.

2.7.7. Graduation Requirements: In order to be awarded Post Graduate Diploma in Community Nutrition, students will be required to enrol and obtain an average pass or score in all the units taken. Students will be required to:

2.7.7.1. Attend at least two thirds of the contact hours set by the Senate.

2.7.7.2. Do course work and examinations in each course for which the student was registered.

2.7.7.3. Submit all field work and research project reports.

2.7.8. Classification of the Degree:

2.7.8.1. The final award of the Post Graduate Diploma in Community Nutrition shall be classified into Distinction, Credit and Pass

2.7.8.2. No candidate shall qualify for the award of Distinction provided that he/she repeated the any unit in the course of study.

2.7.8.3. In coming to its decision as to the class of the post graduate diploma to be awarded to a candidate, the Board of Examiners shall have regard to the overall marks obtained by the candidate and shall classify the post graduate diploma as follows:

Distinction	70% - 100%
Credit	55% - 69%
Pass	40% - 54%

2.8. Course Evaluation: Students and the Head of Department shall carry out evaluation of teaching. Students shall be given an opportunity to confidentially rate their lecturers close to the end of each semester. Completed course evaluation forms shall be forwarded to the Dean of Faculty for analysis. Other methods of evaluation shall be assessment by students learning, continuous evaluation by students, self evaluation and peer evaluation. Course evaluations shall be conducted on at the end of each semester. In the evaluation process, attention will be given to the content of the course, as well as the equipment and materials used for the learning/teaching process.

2.9. Management and Administration of the Programme:

2.9.1. The Post Graduate Diploma in Community Nutrition will be housed in the Tropical Institute of Community Health and Development as a programme within the Department of Community Nutrition. The Institute is headed by a Director, while the Department is headed by a Head of Department of Community Nutrition.

2.9.2. The Director reports to the Deputy Vice-Chancellor for Academic Affairs, who regulates quality of curriculum internally within the University.

2.9.3. There are regular departmental meetings each semester during which lecturers and the Head of Department review the courses and the delivery of the curriculum. The Deans Committee also meets regularly to evaluate

each programme within the University, and make recommendations for improvement, where appropriate. This ensures that quality is both maintained and assured.

2.10. Courses / Units Offered for the Programme

2.10.1. Course Coding System: The general GLUK coding system comprises of abbreviation for the course followed by the following code numbers.

First year courses	100
Second year courses	200
Third year courses	300
Fourth year courses	400

2.11. Duration and Structure of the Programme

S/No	Course code	Course title	Total credit Hours	Description of credit hours			
	Semester 1			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.							
2.							
3.							
4.							
5.							
6.							
	First year: Semester 2			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.							
2.							
3.							
4.							
5.							
6.							
	Total hours		**270**				
	Practical (Partnership Practice-Community Diagnosis)						
	NUT 124	Partnership Practice 1 (Field assessment/Community Diagnosis)	**45**	0	0	0	225
	Second year: Semester 1			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 211	Biochemistry 2	45	31	0	42	0
2.	NUT 212	Health Promotion	45	31	28	0	0
3.	NUT 213	Ethics and Social responsibility	45	31	28	0	0

4.	NUT 214	Therapeutic Nutrition and Dietetics	45	31	14	0	35
5.	NUT 215	Concepts in Health and Development	45	45	0	0	0
6.	NUT 216	Human Nutrition 1	45	31	28	0	0
7.	NUT 217	Principles of Animal Production	45	31	14	0	35
	Total hours		**315**				
	Second year: Semester 2			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 221	Community Health	45	31	28	0	0
2.	NUT 222	Epidemiology and Health	45	31	28	0	0
3.	NUT 223	Therapeutic Nutrition and Dietetics 2	45	31	14	0	35
4.	NUT 224	Food toxicology	45	31	28	0	0
5.	NUT 225	Cell biology and genetics	45	31	0	42	0
6.	NUT 226	Food microbiology	45	31	0	42	0
7.	NUT 227	Biostatistics	45	31	28	0	0
	Total hours		**315**				
	NUT 228	Partnership practice 2 (Community Nutrition Interventions)	**45**	0	0	0	225
	Third year: Semester 1 Public Health Nutrition Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 311	Human Nutrition 2	45	31	28	0	0
2.	NUT 312	Nutrition care and assessment through the life cycle	45	31	0	0	70
3.	NUT 313	Research methods	45	31	28	0	0
4.	NUT 314	Entrepreneurship	45	31	28	0	0
5.	NUT 315	Nutrition anthropology	45	31	28	0	0
6.	NUT 316	Dairy technology	45	31	0	0	70
	Total hours		**270**				
	Third year: Semester 2 Public Health Nutrition Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 321	Nutrition education and intervention in the community	45	31	28	0	0

2.	NUT 322	World food problems and food security	45	31	28	0	0
3.	NUT 323	Dietary supplements and herbal remedies	45	31	28	0	0
4.	NUT 324	Food service system management	45	31	0	42	0
5.	NUT 326	Clinical dietetics	45	31	14	0	35
6.	NUT 327	Geriatric nutrition	45	31	28	0	0
	Total hours		**270**				
	Third year: Semester 1 Food Science Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 311	Human Nutrition 2	45	31	28	0	0
2.	NUT 313	Research methods	45	31	28	0	0
3.	NUT 314	Entrepreneurship	45	31	28	0	0
4.	NUT 315	Nutrition anthropology	45	31	28	0	0
5.	NUT 316	Dairy technology	45	31	0	0	70
6.	NUT 317	Food microbiology 2	45	31	0	42	0
	Total hours		**270**				
	Third year: Semester 2 Food Science Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 322	World food problems and food security	45	31	28	0	0
2.	NUT 323	Dietary supplements and herbal remedies	45	31	28	0	0
3.	NUT 324	Food service system management	45	31	0	42	0
4.	NUT 328	Food processing and product development	45	31	0	42	0
5.	NUT 329	Food quality assurance	45	31	28	0	0
6.	NUT 331	Food engineering	45	31	0	42	0
	Total hours		**270**				
	Third year: Semester 1 Food and Nutrition Policy Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 311	Human Nutrition 2	45	31	28	0	0
2.	NUT 313	Research methods	45	31	28	0	0
3.	NUT 314	Entrepreneurship	45	31	28	0	0
4.	NUT 315	Nutrition anthropology	45	31	28	0	0
5.	NUT 316	Dairy technology	45	31	0	0	70

6.	NUT 318	Food economics and policy	45	31	28	0	0
	Total hours		**270**				
	Third year: Semester 2 Food and Nutrition Policy Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 321	Nutrition education and intervention in the community	45	31	28	0	0
2.	NUT 322	World food problems and food security	45	31	28	0	0
3.	NUT 323	Dietary supplements and herbal remedies	45	31	28	0	0
4.	NUT 324	Food service system management	45	31	0	42	0
5.	NUT 328	Food processing and product development	45	31	0	42	0
6.	NUT 330	Scientific Analysis and presentation of aquaculture	45	31	0	42	0
	Total hours		**270**				
	Electives (One in an academic year when not core unit)						
1.	NUT 325	Food hygiene and environmental health 1	45	31	28	0	0
2.	NUT 312	Nutrition care and assessment through the life cycle	45	31	0	0	70
3.	NUT 321	Nutrition education and intervention in the community	45	31	28	0	0
	Fourth year: Semester 1 Public Health Nutrition Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 411	Current issues in food and Nutrition	45	31	28	0	0
2.	NUT 412	Applied Human Nutrition and community surveillance	45	31	0	0	70
3.	NUT 413	Seminar and special topics	45	17	56	0	0
4.	NUT 414	Food hygiene and environmental health 2	45	31	28	0	0
5.	NUT 415	Research project in Nutrition	45	17	56	0	0
6.	NUT 416	Nutritional epidemiology	45	31	28	0	0
7.	NUT 417	Meal management and service	45	31	0	42	0
	Total hours		**315**				
	Fourth year: Semester 2			**Lectures**	**Tutorials**	**Laboratory**	**Field practical**

	Public Health Nutrition Option			**(1hr)**	**(2hrs)**	**(3hrs)**	**(5hrs)**
1.	NUT 421	Nutrition in emergencies	45	31	28	0	0
2.	NUT 422	Program design, monitoring and evaluation	45	31	28	0	0
3.	NUT 424	Leadership	45	31	28	0	0
4.	NUT 426	Food processing and preservation	45	31	0	42	0
5.	NUT 427	Food biotechnology	45	31	0	42	0
6.	NUT 432	Food law	45	31	28	0	0
	Total hours		**270**				
	Practical (Technical attachment)						
1.	NUT 423	Practicum	**45**	0	0	0	225
	Fourth year: Semester 1 Food Science Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 411	Current issues in food and Nutrition	45	31	28	0	0
2.	NUT 412	Applied Human Nutrition and community surveillance	45	31	0	0	70
3.	NUT 413	Seminar and special topics	45	17	56	0	0
4.	NUT 414	Food hygiene and environmental health 2	45	31	28	0	0
5.	NUT 415	Research project in Nutrition	45	17	56	0	0
6.	NUT 418	Meat technology	45	31	0	42	0
7.	NUT 419	Food analysis	45	31	0	42	0
	Total hours		**315**				
	Fourth year: Semester 2 Food Science Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 422	Program design, monitoring and evaluation	45	31	28	0	0
2.	NUT 426	Food processing and preservation	45	31	0	42	0
3.	NUT 427	Food biotechnology	45	31	0	42	0
4.	NUT 428	Fruit and vegetable technology	45	31	0	42	0
5.	NUT 429	Food industry management	45	31	28	0	0
6.	NUT 432	Food law	45	31	28	0	0
	Total hours		**270**				
	Practical (Technical attachment)						

1.	NUT 423	Practicum	**45**	0	0	0	225
	Fourth year: Semester 1 Food and Nutrition Policy Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 411	Current issues in food and Nutrition	45	31	28	0	0
2.	NUT 412	Applied Human Nutrition and community surveillance	45	31	0	0	70
3.	NUT 413	Seminar and special topics	45	17	56	0	0
4.	NUT 414	Food hygiene and environmental health 2	45	31	28	0	0
5.	NUT 415	Research project in Nutrition	45	17	56	0	0
6.	NUT 430	Agriculture Extension and rural Sociology	45	31	0	0	70
7.	NUT 431	Agricultural economics	45	31	28	0	0
	Total hours		**315**				
	Fourth year: Semester 2 Food and Nutrition Policy Option			**Lectures (1hr)**	**Tutorials (2hrs)**	**Laboratory (3hrs)**	**Field practical (5hrs)**
1.	NUT 421	Nutrition in emergencies	45	31	28	0	0
2.	NUT 422	Program design, monitoring and evaluation	45	31	28	0	0
3.	NUT 426	Food processing and preservation	45	31	0	42	0
4.	NUT 432	Food law	45	31	28	0	0
5.	NUT 433	Agricultural biotechnology	45	31	0	42	0
6.	NUT 434	Food and Nutrition Security	45	31	28	0	0
	Total hours		**270**				
	Practical (Technical attachment)						
1.	NUT 423	Practicum	**45**	0	0	0	225
	Electives						
1.	NUT 421	Nutrition in emergencies	45	31	28	0	0
2.	NUT 432	Food law	45	31	28	0	0
3.	NUT 411	Current issues in food and Nutrition	45	31	28	0	0

2.12. Course Outlines

Title of Course: BIT 111: Introduction to Computers- 45 Contact Hours

Purpose of Course:
The purpose of this course is to introduce the student to computer usage and enable them to learn the application of computers in the business area, as well as and interrelate it to issues in Community Nutrition.

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

1. Define the computer terminology and description.
2. Explain the impact of computers on the modern society.
3. Describe the elements of logical reasoning.
4. Explain the aspects of basic programming language.
5. Apply the practical skills of computer systems.

Course Content:
The topics to be covered include: Introduction to the concepts in computer studies; computer history, computer hardware and software; problem solving and algorithms; the utilization of information systems for various business applications; hands-on usage of the computer in using a word processor, a spreadsheet and basic programming; the internet and the world-wide web; and computer crime.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Work-based assignment

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar paper and presentation
3. Continuous Assessment Test
4. Final examination

Core Reading Materials for the Course:

1. Mandel, S. L. (1992). *Computers and Information Processing: Concepts and Applications* (6th edition). New York: West Publishing Co.
2. Norusis, M. J. (1990). *SPSS/PC+ 4.0 Base Manual*. Chicago: SPSS Inc.
3. Bride, M. (1998). *Teach Yourself Windows 98.* London: Hodder & Stoughton Ltd.
4. McKenzie, C. and Bryden, P. (1998). *Extending Word 97 for Windows.* Oxford: Heinemann Educational Publishers.
5. Mano, M. M. (1999). *Computer Engineering: Hardware Design*. Prentice- Hall.

Recommended Reference Materials:

1. Erickson, F. J. and Vonk, J. A. (1996). *Effective Excel 7.0.* Boston: IRWIN Inc.
2. Bradley, R. (1999). *Computer Science for Advanced Level* (4th edition). London: Stanley Thornes.
3. Weiss, M. A. (1999). *Data Structures and Algorithm Analysis in Java*. Massachusetts.

Title of Course: EPS 122: Counselling - 45 Contact Hours

Purpose of Course:
The purpose of this course is to equip learners with the basic counselling skills that are required by nutrition students to enable them handle different patients with different forms of food and nutrition needs.

Expected Learning Outcomes:
By the end of the course the students should be able to:

1. Establish rapport with clients.
2. Counsel clients who visit the health institution.
3. Maintain follow-up sessions for the client.

Course Content:
The topics to be covered in this unit includes: Introduction to Counselling in Community Nutrition; key definitions in nutrition counselling; core conditions of counselling; the relationship between nutrition and mental health; theories of counselling in nutrition context (behavioural, gestalt, person centred, self management approach, family therapy and RET); self concept; qualities of a good counsellor; counselling skills and the counselling process; counselling for lactating mothers; and nutrition and HIV; counselling for families, children and adolescents; guide to conducting a nutrition therapy; drawing a food drug time table; and counselling ethics.

Mode of Delivery:

1. lectures
2. group discussions
3. role plays
4. experiential learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes and assignments
2. Seminar paper and presentation
3. Continuous Assessment Test
4. Final examination

Core Reading Materials for the Course:

1. Scarlet, S. and A. Stewart Truswell (1998). *Dietary Counselling in Essentials of Human Nutrition*. Oxford University Press.

2. Mearns, D. and Thorne, G. (1999). *Person Centred Counselling in Action*. Sage Publications.
3. Mitchell, M.K. (1997). *Nutrition across the Life Span.* Philadelphia: W. B. Saunders Company.

Recommended Reference Materials:

1. American Dietetic Association and Dieticians of Canada. (2000). *Manual of Clinical Dietetics* 6th edition. Chicago, Illinois: American Dietetic Association.
2. Hammond, K. A. (2000). *Dietary and Clinical Assessment in Krause's Food Nutrition and Diet Therapy*. W.B. Saunders Company.
3. Rowan, J. (1998). *The Reality Game: A Guide to Humanistic Counselling and Therapy.* Routledge: Taylor and Francis Books Ltd.

Title of Course: HNS 107: Communication Skills- 45 Contact Hours

Purpose of Course:
The purpose of this course is to give the learner the skills for effective communication, demonstrate adequate writing skills and to recognize the human behaviour through the lens of communication.

Expected Learning Outcomes:
This course is intended to enable students to:
1. Describe the structure and function of human communication and in the process develop into effective communicators.
2. Develop and employ the skills of critical thinking.
3. Distinguish the communication theories, processes and techniques at organizational, managerial and personal levels.
4. Employ proper writing skills in report preparation and presentation.

Course Content:
The course content includes: verbal and non-verbal messages; business writing; speaking in business contexts (presentations, seminars, meetings, interviews and interviewing); conflict resolution; communication and technology in the work place; mass and group communication; formal report writing; business correspondence; team work; business meetings, negotiations and discussions; active listening.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Role plays
4. Experiential learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Seminar paper and presentation

2. Continuous Assessment Tests (CATS)
3. Final written examination

Core Reading Materials for the Course:

1. Marin, J. R. (1990). *Factual Writing: Exploring and Challenging Social Reality*. Oxford University Press.
2. Hamp-Lyons, L. and Heasley B. (1987). *Study Writing: A course in written English for Academic and Professional Purposes.* Cambridge University Press.
3. Doughty, P. P. and Thomton, J. G. (1973). *Language in Use.* Edward Arnold.
4. Bhasker, W. W. S. and Prabhu, N. S. (1975). *English through Reading*. Vols. 1 and 2. Macmillan Publishers.
5. Freeman, Sarah (1977). *Written Communication*. Orient Longman.
6. Saraswati, V. *Organised Writing*. Book 1. Orient Longman.
7. Mohan Krishna and Singh N. P. (1995). *Speaking English Effectively*. Macmillan.
8. Mohan Krishna and Banerji Meera. (1990). *Developing Communication Skills*. Macmillan Publishers.
9. Bellare, N. (1998). *Reading Strategies*. Vol. 1 and 2. Oxford University Press.

Recommended Reference Materials:

1. Freeman, S. (1979). *Study Strategies*. Oxford University Press.
2. Widdowson H. G. *English in Focus. English for Social Sciences*. Oxford University Press.
3. Narayanaswami V. R. *Organised Writing. Book 2*. Orient Longman.

Title of Course: NUT 111: Health Psychology and Sociology - 45 Contact Hours

Purpose of Course:
The students will acquire basic principles and describe the essential aspects of health psychology and sociology.

Expected Learning Outcomes:
By the end of the course the students should be able to:

1. Familiarize themselves with the basic concepts of health psychology and sociology.
2. Apply their learning and understanding of health psychology and sociology to their own opportunities available to them in life.
3. Understand the need of health psychology and sociology in the contemporary world in general and Kenya in particular.
4. Critique and evaluate the various aspects of health psychology and sociology in relation to actual lifestyle at the community level.

Course Content:
The course includes: the meaning, definitions, nature, scope, methods, schools of psychology; branches of sociology; the relationship between health psychology and sociology and other social sciences; behaviour (physiological basis, the study of the nervous system, nature and nurture-meaning, and mechanism of hereditary); environment, relative importance of heredity and environment; sensation and perception (principles of perceptual organization, perception of form, space and movement, illusion and types of illusions); attention and interest (nature, types of attention, factors affecting attention, distraction of attention); interest (nature, definition, types of interest, relationship between

interest and attention, cause of inattention, steps necessary for attention); motivation (difference between psychogenic and sociogenic motives, theories of motivation, states of consciousness); levels of information processing, sleep and dreams; the emergence and development of sociology-pioneers (Auguste Comte, Herbert Spencer, Emile Durkheim-Max Weber); development of sociology in the twentieth century and its position in the contemporary period; society, social stratification and class structure; characteristics of human society and types of human societies; systems of social stratification in modern societies; classes in Western societies today; gender and stratification, social mobility, poverty and inequality; culture and social norms (characteristics of culture, meaning of social norms and functions of culture and importance of culture and social norms).

Mode of Delivery:

1. lectures
2. group discussions
3. case studies
4. individual and work-based assignment

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes
2. Seminar paper and presentation
3. Continuous Assessment Test
4. Final examination

Core Reading Materials for the Course:

1. Haramos and Holborn (2002). *Sociology: Themes and Perspectives*. London: Harpers Collins Ltd.
2. Mathur, S. S. (2001). *Education Psychology*.

Recommended Reference Materials:

1. Myers, G. D. (2001). *Psychology* (6^{th} ed).
2. Rao S. C. N. (1999). *Sociology: Primary Principles of Sociology with an Introduction to Social Thought*. New Delhi: S. Chand and Company Ltd.
3. Soroka Bryhal (1992). *Sociology, Cultural Diversity in Changing World*. London: Allyn and Bacon.

Title of Course: NUT 112: Applied Physics- 45 Contact Hours

Purpose of Course:

To enable the student to understand the basic principles, roles and application of Physics in our daily lives.

Expected Learning Outcomes:

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

1. Define the various types of measurements.

2. Describe the different concepts behind the laws of motion, wave, light, optical instruments.
3. Explain the elements of nuclear physics.
4. Analyse the link between physics and chemistry

Course Content:
The topics to be covered include the system of measurements- basic derived units, conversion factors, and scientific (exponential) notations; motion and conservation of momentum; scalar and vector quantities; acceleration due to gravity; force and motion; Newton's Laws of motion; momentum; energy and derivation of kinetic energy equation; thermal physics (temperature, temperature scales, heat as a form of energy, specific heat and transfer of heat); wave motion; sound; wave speed, frequency, wavelength and amplitude; sound waves, speed of sound, frequency and wave length-loudness; light (nature of light, source of light, light rays, laws of reflection, images formed by flat mirrors, curved mirrors and lenses).

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
1. Overhead projector
2. LCD PowerPoint presentation

Course Assessment:
1. Seminar paper and presentation
2. Continuous Assessment Test
3. Final examination

Core Reading Materials for the Course:
1. Faughn, J. S., Chang, R. and Turk, J. (1995): *Physical Science*. (2nd ed) Saunders College Publishing Company.
2. Raul S., Bernard, R. and Peter S. (2000). *Chemistry for the Life Sciences*. Lifeline series. CRC Press.
3. David L. (2004). *Textbook of Chemistry and Physics,* Student Edition. 84th Edition. CRC Press.
4. Vemulapalli, G. K. (2003). *Physical Chemistry*. India: Prentice-Hall.

Recommended Reference Materials:
1. Donald A., Quarrie M., and Simon. J. D., *Physical Chemistry: A Molecular Approach.* Viva.
2. Silbey, S. R. J. and Alberty, R. A. *Physical Chemistry* 3rd Edition. John Willey & Sons.

Title of Course: NUT 113: Chemistry -- 60 Contact Hours

Purpose of Course:

To introduce the learner to the constitution and properties of the different classes of organic compounds, with considerable attention to stereochemistry, reaction mechanisms, synthetic organic chemistry, spectroscopy and bio-organic. The laboratory work involves an introduction to the major synthetic and analytical techniques of organic chemistry including the preparation of representative organic compounds and the isolation of compounds from natural sources.

Expected Learning Outcomes:
By the end of the course students should be able to:

1. Predict the synthesis of new organic molecules and polymers.
2. Describe the structure, functionality, and reactivity of organic molecules in the understanding of numerous and disparate phenomena, from biological and biochemical processes (enzyme-substrate interactions), to medicine (pharmaceuticals), to the properties of materials (polymers).
3. Discuss the fundamental principles of organic and inorganic chemistry, allowing the student to begin understanding the language of chemists.
4. Outline the properties and characteristics of molecules, and several key reactions and reaction mechanisms.

Course Content:
The topics to be covered include: Introduction and Review (Lewis structures, the octet rule molecular orbital theory, orbital hybridizations electro negativity, and resonance structures); Introduction to Functional Groups (the most common functional groups, basic nomenclature, alkanes, conformations of cycloalkanes and properties of alkanes); Alkenes, the double bond: nomenclature and stereoisomer, introduction to organic reactions; Introduction to Electron Pushing Mechanisms (oxidation and reduction of organic molecules, radical polymerization and the terpenes); Benzene and Aromaticity (structure of benzenes, aromaticity, electrophilic aromatic substitution reactions, effects of substituents on substitution); Stereochemistry (Stereochemistry and Fischer Projections, Optical Activity); Alcohols, Ethers and Thiols (hydrogen bonding and other properties, reactions of alcohols: substitution and elimination); Details of Nucleophilic Substitution and Beta-Elimination Mechanisms, mechanisms of E_1 and E_2; Introduction to Carbonyls (physical properties and reactions of carbonyls nucleophilic addition reactions); Details of Nucleophilic Addition Reactions; Carbohydrate chemistry; Carboxylic Acids Properties and Acidity; reactions of carboxylic acids reactions of carboxylic acid derivatives, the aldol reaction, the claisen condensation; Amines (properties and basicity).

Mode of Delivery:

1. Lectures
2. Group discussions
3. Role plays
4. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes

2. Seminar paper and presentation
3. CAT
4. Final examination

Core Reading Materials for the Course:

1. Solomons and Fryhle. (2005). *Organic Chemistry* 8th Edition. Wiley.
2. Holum, J. R. (1998). *Fundamentals of General, Organic and Biological Chemistry* 6th edition, New York: John Wiley and Sons.
3. Julius, B. C. (2007). *A Class-Book of Organic Chemistry*, Volume 2. Macmillan and Co. Limited.

Recommended Reference Materials:

1. Stanley, E. M. (2009). F*undamentals of Sustainable Chemical Science*. CRC press.
2. Abolghasem, J. (2009). *Handbook of Solubility Data for Pharmaceuticals*. CRC press.
3. Bernthsen, A. and McGowan, G. (2006). *A Text-Book of Organic Chemistry.* Blackie & Son, Ltd.

Title of Course: EEN 113: Critical And Creative Reading - 45 Contact Hours

Purpose of Course:

The purpose of the course is to provide the learner with skills in critical reading and writing for quality reports.

Expected Learning Outcomes:

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

1. Define the principles and concepts in critical thinking.
2. Demonstrate the ability to think clearly, logically, critically and effectively.
3. Demonstrate proficiency in analysis, inference and evaluation.

Course Content:

The topic in the course include: Solving issue oriented problems and making informed decisions; Generating, organizing, and evaluating ideas; Analytical reasoning; Evaluating validity of information; Reading strategies applicable to core content area courses; Library research techniques, both onsite and online.

Mode of Delivery:

1. Lectures
2. Seminars
3. Practical

Instructional Materials:

1. Audiovisuals
2. power point,
3. posters,
4. overhead projector

Course Assessment:

1. Continuous Assessment Tests (CATS)

2. Class assignments
3. Final written examination

Core Reading Materials for the Course:

1. Esat, R., Morrison, A. and Norton, J. (1990). *Advanced Reading, Thinking and Writing Skills.* Nairobi: East African Publishers Ltd.
2. Peter, C. B. (1994) .*A Guide to Academic Writings*. Eldoret: ZAPF/Chancery.

Recommended Reference Materials:

1. Mugenda, A. B. and Mugenda, O. M. (1999) *Research Methods: Quantitative and Qualitative Approaches.* Nairobi: ACTS Press.
2. Petiti, Diana B. (1994) *Material Analysis and Decision Analysis*. New York. Oxford University Press.

Title of Course: GCC 102: Introduction to Statistics -- 45 Contact Hours

Purpose of Course:

The purpose is to introduce the learner to basic statistics and analysis methods of data.

Expected Learning Outcomes:

To enable students to:

1. Describe the concepts of statistics.
2. Outline the various types of analysis.
3. Describe the different modes of data presentation.
4. Conduct some data collection, analyse and present in a report.

Course Content:

The content of this course will include: the basic ideas of statistics; Mathematical details as calculus; differentiations; integration and problem solutions using equations; an introduction to methods of summarising and presenting data; estimation, confidence intervals and hypothesis testing; a practical introduction to statistical methods; appropriate methods of analysing data; Descriptive statistics, graphical and numerical summarisation of data; introduction to a statistical package; distributions (binomial and normal); sampling distribution of the mean; the *t*-distribution; confidence intervals; hypothesis testing ideas (single-sample and two-sample problems); *t*-tests, paired samples; their analysis and importance; estimating and testing for proportions; regression analysis; introduction to Analysis of Variance (ANOVA).

Mode of Delivery:

1. Lectures
2. Seminars
3. Practical

Instructional Materials:

1. Audiovisuals
2. Power-point
3. posters
4. overhead projector

Course Assessment:

1. Continuous Assessment Tests (CATS)
2. Class assignments
3. Final written examination

Core Reading Materials for the Course:

1. Colton T. (1974). *Statistics in Medicine*, Little Brown.
2. Mills A. (1985). *Economic Evaluation of Development Programmes: Application of the Principles in Developing Countries.* WHO.
3. Richard P. R. and Audrey H. (1982) *Business Statistics*. Richard D Irwin, Inc.
4. Kirkwood, B. R. (1988.) *Essentials of Medical Statistics*: Blackwell

Recommended Reference Materials:

1. Robert, D. M. and Douglas, A. L. (1990). *Statistical Techniques in Business and Economics*. Richard D. Irwin, Inc.
2. Runyon, R. P., Harber, A., Pittenger, D. J., and Coleman, A.K. (1996) *Fundamentals of Behavioural Statistics*. New York: McGraw-Hill Companies, Inc.
3. Armitage, P. (1987). *Statistical Methods in Medical Research*. Oxford: OUP.
4. Frank, H. and Althoen, S. C. (1994). *Statistics*. New York. Cambridge University Press.
5. Cochran, W. G. (1977). *Sampling Techniques*. New York: John Wiley and Sons.

Title of Course: HNS 112: Human Anatomy and Physiology - 60 Contact Hours

Purpose of Course:

The purpose of the course is to provide the learner with skills in the human anatomy and physiology for implementing nutritional care.

Expected Learning Outcomes:

Upon successful completion of this course the student should be able to:

1. Identify the basic structures of a human cell and describe the function of each.
2. Recognize the systemic approach to body organization and use this approach to organize human structures.
3. Identify histological and gross structures associated with each body system.
4. Describe functions of organs and organ systems.
5. Demonstrate laboratory techniques and procedures required for study and assessment of the human body.
6. Recognize anomalies and common pathological conditions of human organ systems.

Course Content:

The content of this course includes: basic knowledge on human structures and their function; the relationship of structures to function in the organ systems of the human body; the identification of the anatomical features and their functions; Definitions; man as a mammal/primate; the cell smallest unit of living; body tissues (epithelial tissues, connective tissues- adipose, cartilage, bones, muscular tissues, nervous tissues, neuron); fluid tissues (connective tissues, blood and lymph); organs systems, skeletal and connective systems (skeletal joints); muscular systems; respiratory systems; circulatory system (blood, spleen-lymph, heart, veins, arteries, capillaries); digestive and glandular systems (food chain, digestion); excretory system (metabolism, liver, pancreases, excretion, regulation of body fluids, skin, kidney, bladder); regulation of body heat and

temperature; nervous system (spinal cord/nerves, brain); reproductive systems; organs of special tissues (eyes, ears, dustless glands- thyroid, parathyroid, thymus, adrenal/glands, pituitary).

Mode of Delivery:

1. Lectures
2. Seminars
3. Practical

Instructional Materials:

1. Audiovisuals
2. power point
3. posters
4. overhead projector

Course Assessment:

1. Continuous Assessment Tests (CATS)
2. Class assignments
3. Final written examination

Core Reading Materials for the Course:

1. Wilson, R. (2001). *Anatomy and Physiology in Health and Illness*. The Mirror Mosby.
2. Arthur, C. and Gayton, T. (2006). *Textbook of Medical Physiology*. Philadelphia, WB, Saunders.
3. Thibbodeu, R. (1995). *Anatomy and Physiology*. The Mirror Mosby.

Recommended Reference Materials:

1. Fasana, F. (1998). *Text Book of Medical Embryology Normal and Abnormal development*.
2. Ganong, W. F. (2007). *Review of Medical Physiology*. Mosby.

Title of Course: HNS 113: Biochemistry I -- 60 Contact Hours

Purpose of Course:

The course gives a deeper understanding of nutrition of cellular mechanisms and metabolic events governing health. The insight and perspective requires increased knowledge of the chemical actions occurring deep in the human body - the domain of biochemistry.

Expected Learning Outcomes:

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

1. Compare and contrast structures of prokaryotic and eukaryotic cells and understand the significance of these differences in patterns of evolution and treatment of disease.
2. Recognize major classes of bio-molecules, their structure/function relationships and their characterisation.

Course Content:

The topics covered in this course include: Introduction to biochemistry; chemical composition of bio-molecules; the cell and organelles; Carbohydrates (monosaccharide, disaccharides, polysaccharides); glycolysis; TCA (Krebs) cycle; Vitamins; water and fat soluble vitamins; Disorders arising due to nutritional deficiencies; Proteins (amino acids, biosynthesis of proteins, essential amino acids and non-essential amino acids, biosynthesis of amino acids); the urea cycle and de-amination process; Water and its unique properties; Henderson-Hasselbalch equation (pH, pKa and pKw); and buffers and buffer preparation.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Role plays
4. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Murray, R. K., Granner, D. K., Mayes, P. A. et al., editors. (2000). *Harper's Biochemistry.* 25th edition. New York: McGraw-Hill Press.
2. David L. Nelson and Cox, M. M. (2000). *Lehninger Principles of Biochemistry*, Third Edition (Hardcover). W. H. Freeman.
3. Yiu H. Hui, Wai-Kit Nip. (2006). *Food Biochemistry and Processing*. Wiley Blackwell Publishers.

Recommended Reference Materials:

1. Zubay, G. (1993). *Biochemistry* (3rd edition). Dubuque. Iowa. Melbourne. Oxford. Wm. C. Brown Communications, Inc.
2. Fatih Yildiz (2009). *Advances in Biochemistry*. Ankara, Turkey: Middle East Technical University.
3. Richard Owusu-Apenten. (2004). *Food Chemistry*. Coleraine, Northern Ireland: University of Ulster.

Title of Course: NUT 121: Nutrition and HIV/AIDS -- 45 Contact Hours

Purpose of Course:

The purpose of the course is to equip the students with skills of nutritionally managing HIV/AIDS in the communities.

Expected Learning Outcomes:

By the end of the course, the students will be able to:

1. Describe the interventions for Nutritional Care and Support for PLWHA…
2. Explain the processes of planning for Nutrition action for PLWHA
3. Design interventions for food security and food quality in the context of HIV/AIDS
4. Conduct and analyze nutritional surveys using both qualitative and quantitative techniques in care and support of PLWHA.

Course Content:
The course topics will include: Basics of HIV/AIDS in Africa; Introduction to Current Nutrition; Link between Nutrition and HIV/AIDS; Nutrition Actions for PLWHA; Household food security and HIV/AIDS; Nutritional management of HIV/AIDS-related symptoms; Nutritional care & support of pregnant/lactating women/ adolescent girls infected with HIV/AIDS; Issues and challenges in providing optimum nutrition.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
1. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.
2. Community partnership sites

Course Assessment:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course::
1. Gillespie, S. and Kadiyala, S. (2005). *International Conference on HIV/AIDS and Food and Nutrition Security: From Evidence to Action.* International Food Policy Research Institute. Washington.
2. FANTA (2003). *Nutrition and HIV/AIDS: a training manual*. FANTA. Kampala. http://www.pronutrition.org/files/training_total.pdf

Recommended Reference Materials:
1. WHO (2005). *Consultation on Nutrition and HIV/AIDS in Africa*: *Evidence, lessons, and recommendations for action - ICC*, Durban, South Africa, 10-13 April 2005. Geneva.http://www.who.int/nutrition/topics/consultation_nutrition_and_hivaids/en/index.html.

Title of Course: NUT 122: General Microbiology -- 45 Contact Hours

Purpose of Course:
The purpose of this course is to provide the learner with skills on the identification and management of disease that affect the human health.

Expected Learning Outcomes:

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

1. State the aetiology of common communicable and non-communicable diseases and state the methods of prevention.
2. Demonstrate the application of appropriate strategies to elaborate responsive health plans to contain non-communicable and communicable diseases.
3. Recognize the common non-communicable and communicable diseases in their area of coverage.
4. Develop surveillance systems for non communicable and communicable diseases.

Course Content:

Topics in this course will include: infectious diseases nutrition; reproductive health; child and adolescent health; aetiology; health and wellness; sexuality; reproductive choices and pregnancy; nutrition and weight; alcohol, tobacco and caffeine; heart, health and disease; cancer and non-infectious conditions; communicable diseases and sexually transmitted infections; aging and nutrition; as well as genetics and genetic disease.

Mode of Delivery:

1. Lectures
2. Seminars
3. Practical

Instructional Materials:

1. power point
2. posters
3. overhead projector

Course Assessment

1. Continuous Assessment Tests (CATS)
2. Class assignments
3. Final written examination

Core Reading Materials for the Course:

1. King, M. (1966). *Medical Care in Developing Countries*. Lusaka: Oxford University Press.
2. WHO. (1999). *Home Care Issues at the Approach of the 21st Century from WHO Perspective.*
3. Glanz, K., Rimer, B. K. and Lewis, F. M. (2002). *Health Behaviour and Health Education*: Theory, Research, and Practice (3rd Ed). San Franscisco: Jossey-Bass.
4. Hawes, H. and Schotchomer, C. (1993). *Children's Health: Children as Communicators of Facts for Life.* St Albans. TALC.

Recommended Reference Materials:

1. Dhillon, H. S. and Deutsch, C. (1994). *A Human Relations, Communication and Leadership Programmes to Strengthen the Links among Health Workers, Supervisors, and the Community*. Geneva: WHO.
2. UNICEF (1993). *Facts for Life: a Communication Challenge*. Oxford: UNICEF

Title of Course: NUT 123: Partnership Practice I - 300 Contact HOURS

Purpose of Course:

The purpose of the course is to equip the students with skills for conducting community diagnosis within the partnership practice programme.

Expected Learning Outcomes:
By the end of this module students will be able to:

1. Discus the concept of partnership in health and development.
2. Apply the concepts of health and development to their day-to-day work challenges through engagement in partnership practice programme.
3. Recognize and describe the common health and development problems in the partnership community.
4. Conduct a community diagnosis in health and development.
5. Facilitate a feedback workshop.
6. Recommend on the best way forward after the community diagnosis

Course Content:
The topics will include: Introduction to partnerships in health and development; principles and levels of partnership; participatory methods; TICH partnership model; general management of health situations; the working of the health system and various public health programmes and activities carried out by the various special units with in the Ministry of Health (Malaria Control, HIV/AIDS and TB control, Nutrition, EPI, Health Promotion); elements of epidemiological studies on diseases prevalent in the catchments area of the health centre of practice; special attention on respiratory diseases, diarrhoeal diseases and diseases related to nutrition, and how the development context influences these.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Individual and work based assignment
5. Assignment of mentors for follow-up, support and assessment in partnership practice

Instructional Materials:

1. Community and service partnership site
2. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:

1. A feedback workshop (20 marks).
2. A seminar presentation (10 marks).
3. Immediate supervisor assessment (10 marks).
4. Partnership Practice I report (40 marks).

Core Reading Materials for the Course:

1. Ocholla-Ayayo, A.B.C. (1991). *The Spirit of a Nation.* Nairobi: Shirikon Publishers.
2. TICH *Partnership Practice Manual*, Unpublished.
3. TICH (2003). *The Quest for Equity in Access to Health and Development: Scaling Up of Best Practices in Decentralized District Systems.* Nairobi: TICH.

Recommended Reference Materials:

1. Population Studies and Research Institute. (2001). *Population, Health and Development in Africa.* Nairobi: Impress Communications.
2. Taylor-Ide, D. and Taylor, C. (2002). *Just and Lasting Change: When Communities Own Their Futures.* Baltimore: The John Hopkins University Press.
3. Ikiara, M. M. (2001). *Vision for long term Development.* Nairobi: Kenya Institute for Public Policy Research and Analysis.
4. Narayan, D. et al (2000). *Can Anyone Hear Us? Voices of the poor.* New York: Oxford University Press.
5. Narayan, D. et al (2000). *Crying out for Change*: *Voices of the Poor.* Washington D.C: World Bank.

Title of Course: NUT 211: Biochemistry II -- 60 Contact Hours

Purpose of Course:

To study the relationship between cell structure and cell function. The structure/function of the cell membrane and most organelles are covered in detail.

Expected Learning Outcomes:

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

1. Describe the major classes of bio-molecules, their structure/function relationships and their characterization.
2. Discuss the metabolism of proteins, nucleic acid and proteins.
3. Demonstrate operation of biochemical equipment.

Course Content:

Enzymology (enzyme kinetics, saturation kinetics, competitive, uncompetitive and non-competitive enzymatic inhibition); fatty acids (nomenclature of fatty acids, synthesis, metabolism, transportation and mobilization mechanisms, sterols synthesis, LDL, HDL, and triglycerides, lipid disorders and bile pigments); nucleic acids (nucleotides, nucleosides, definition of basic terms in molecular biology, base pairing, transcription mechanisms, translation of proteins, purine and pyrimidine synthesis and metabolism and HMP shunt); Polymerase Chain Reaction (PCR) and its application in biochemistry; application of enzymatic kinetics in medical sciences; biochemical pathways and diseases/disorders resulting due to defects; and pharmacological rationale in their treatment and/or management.

Mode of Delivery:

1. Lecture
2. Practical
3. Group work

Instructional Materials:

1. Power-point
2. Posters
3. overhead projector

Course Assessment:

1. Continuous assessment tests
2. Final written examination

Core Reading Materials for the Course:

1. Murray, R. K., Granner, D. K., Mayes, P. A., et al., editors. (2000). *Harper's Biochemistry* 25th edition. New York: McGraw-Hill Press.
2. David L. Nelson and Cox, M.M. (2000). *Lehninger Principles of Biochemistry*, Third Edition. W. H. Freeman.
3. Yiu H. Hui, Wai-Kit Nip. (2006). *Food Biochemistry and Processing*. Wiley: Blackwell Publishers.

Recommended Reference Materials:

1. Zubay, G. (1993*). Biochemistry* (3rd edition). Dubuque, Iowa, Melbourne, Oxford: Wm. C. Brown Communications, Inc.
2. Fatih Yildiz (2009). *Advances in Biochemistry*. Ankara, Turkey: Middle East Technical University.
3. Richard Owusu-Apenten. (2004). *Food Chemistry*. Coleraine, Northern Ireland: University of Ulster.

Title of Course: NUT 212: Meal Management and Service -- 45 Contact Hours

Purpose of Course:

The purpose of this course is to equip the learner with the principles of management for quality food production.

Expected Learning Outcomes:

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

1. Describe the concepts, principles and techniques of quantity food management
2. Explain the roles and responsibilities of food service manager
3. Apply the quantitative and qualitative standards in quantity food production
4. Develop menus which meets staffing, equipment and nutritional constrains
5. Describe the principles of purchasing and production in food service systems management

Course Content:

Topics to be covered will include: quantity food planning and management; definitions; classical principles of an organization chart; self appraisal on managerial know-how; pre test and tools of management; theories of management; strategic management; functions of management; skills of managers; management activities and roles; principles of producing menu; functions and use of food service equipment; aspects of quantity food management; food safety and HACCP; cleaning, sanitation and safety; production; distribution in food service; labour control; facilities planning and design; and receiving storage and inventory.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Seminar paper and presentation
2. CAT
3. Final examination

Core Reading Materials for the Course:

1. Spears, C. M. (2000). *Food Service Organizations*. New Jersey: Prentice Hall.
2. Payne, P. et al., (2005). *Introduction to Food Service.* New Jersey: Prentice Hall.
3. Joan, B. K. and Linda, K. (1996). *Quantity Food Production and Management.* New York: Van Nostrand Reinhold.
4. Pannell, D. (1990). *School Food Service Management*. New York: Van Nostrand Reinhold.

Recommended Reference Materials:

1. Holmberg, R. (1983). *Meal Management Today*. Illinois: Waveland Press, Inc.
2. Mclean, B. B. (1964). *Meal Planning and Service*. Illinois: Chas A. Bennett Co, Inc.
3. Kinder, Faye. (1962). *Meal Management*. New York: Macmillan Company.

Title of Course: NUT 213: Ethics and Social Responsibilities - 45 Contact Hours

Purpose of Course:

The purpose is to introduce the learner to the concepts of to ethics and social responsibilities in the context of managing the communities.

Expected Learning Outcomes:

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

1. Describe the history and evolution of values and ethics in the work profession.
2. Demonstrate skills in applying relevant ethics, concepts and theories of ethics to work practice.
3. Recognize the professional, legal and ethical standards of practice, their role in competent, ethical social work and times at which legal and professional standards may conflict.
4. Define the interplay of personal values and professional behaviour.
5. Recognize ethical issues and to apply ethical decision-making frameworks and protocols through enhanced use of critical thinking skills.

Course Content:

The core content areas include: History and evolution of values and ethics in social work; ethical theories (Abramson, Gilligan, Levy, Keith-Lucas, Loewenberg, and Reamer); professional standards of social work practice; ethical codes social workers; legal requirements and other considerations for registration, certification and licensing; professional values and self-awareness about ethical professional behaviour; ethical decision making processes and dilemma examples.

Mode of Delivery:

1. Lecture
2. Practical
3. Group work

Instructional Materials:

1. Power-point
2. Posters
3. overhead projector

Course Assessment:

1. Continuous assessment tests
2. Final written examination

Core Reading Materials for the Course:

1. Abramson, M. (1996). *Reflections on Knowing Oneself Ethically: Toward A Framework for Social Work Practice.* Families and Society, 77, 195-201.
2. Black, P. N., Congress, E. N. and Strom-Gottfried, K. (2002). *Teaching Social Work Values and Ethics: A Curriculum Resource.* Washington DC: Council on Social Work Education.
3. Fadia, V. (2001). *Ethical Decision Making for Social Workers*. Homestead Schools.
4. International Federation of Social Workers. (1994). *The Ethics of Social Work Principles and Standards*. Berne, Switzerland: Author.

Recommended Reference Materials:

1. Reamer, F. G. (1998). *The Evolution of Social Work Ethics*. Social Work, 43, 488-500.
2. Reamer, F. G. (2000). *The Social Work Ethics Audit: A Risk-Management Strategy.* Social Work, 45, 355-366.
3. Reamer, F. G. (2002). *Ethical Issues in Social Work*. In A. R. Roberts, & G. J. Greene, (Eds.), *Social Workers' Desk Reference*, pp. 65-69. New York: Oxford University Press.
4. Strom-Gottfried, K. (2000). *Ensuring Ethical Practice: An Examination of NASW Code Violations*, 1986-97. Social Work, 45, 251-261.
5. Strom-Gottfried, K. (2000). *Ethical Vulnerability in Social Work Education: An Analysis of NASW Complaints*, 1986-97. Journal of Social Work Education, 36. 241-252.
6. Walker, R., & Staton, M. (2000). *Multiculturalism in Social Work Ethics*. Journal of Social Work.

Title of Course: NUT 214: Concepts in Health and Development - 45 Contact Hours

Purpose of Course:

The purpose is to introduce the learner to the concepts, issues, contextual factors and strategies in health and development.

Expected Learning Outcomes:

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

1. Describe the concepts of health and development and apply them to the national and international trends in health and development.
2. Identify factors, policies and strategies at national and international levels and their impact on health status of populations as well as health care delivery systems.

3. Describe the social and economic development contexts that influence health care needs and health systems.

Course Content:
The topics in the course will include: an analysis of health care and development within the context of the challenges of a developing country; concepts, issues, trends and debates in health and development at the local, national and global levels; theories and practice of managing health systems; concepts of health and development; definitions of public health and sustainable development; social concepts of disease and illness; social determinants of health status; international trends in health and development; mortality and morbidity trends; as well as policies influencing mortality and morbidity trends.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment.
5. Partnership exercises: community entry and situation analysis.
6. Assignment of mentors for follow-up, support and assessment in partnership practice.

Instructional Materials:
1. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.
2. Community partnership sites.

Course Assessment:
The students are assessed through:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).
4. Continuous assessment of partnership practice, based on direct supervision.

Core Reading Materials for the Course:

1. Basch, P. (1990) *Textbook of International Health*. New York: Oxford University Press.
2. Murray, C. J. L. (1994) .*Global Comparative Assessment*. Geneva: WHO.
3. Paul, B.D. (1955). *Health, Culture and Community.* New York: Russell Sage Foundation.

Recommended Reference Materials:

1. World Bank. (1994). *Action for Better Health*. Washington DC: World Bank.
2. World Bank. (1994). *Better Health in Africa*. Washington DC: World Bank.
3. Alemayehu, G. et al (2002). *Determinants of Poverty in Kenya: Household Level Analysis.* Nairobi: Kenya Institute for Public Policy Research and Analysis.
4. Lester R. (2001). *State of the World 2001*. New York: W. W. Norton.
5. Government of Kenya, Office of the President. *District Focus for Rural Development.* Nairobi: Government Printer.
6. Sanders, D. (1985). *The Struggle for Health, Medicine and the Politics of Underdevelopment*. London: Macmillan.

Title of Course: NUT 215: Human Nutrition I -- 45 Contact Hours

Purpose of Course:
The purpose of this course is to introduce the student to the basic principles of human nutrition, and the effect of food on humans as living organisms, as well as to provide students with a comprehensive ability to analyse world food situations and the problem of hunger, using an ecologically/food system approach.

Expected Learning Outcomes:
This course is intended to enable student to:

1. Describe the relationship of nutrition to health.
2. Identify the major functions of the various nutrients and their major food sources.
3. Recognize deficiency and toxicity symptoms of the various nutrients.
4. Describe the social, physiological, psychological, and cultural factors that influence food choices through out the life cycle.
5. Compare nutrition information from a scientific perspective to distinguish scientific findings from untested claims.
6. Identify food patterns that increase the risk of chronic health problems and recommend modifications to the diet to reduce the risk of developing these health problems.
7. Identify the causes of hunger in developing and industrialized countries.

Course Content:
The topics will include: an overview of nutrition, the aspects of food choices and how to develop a diet planning guide; the process of digestion absorption and transport of nutrients in the body including their functions; the synthesis metabolism and function of micronutrients and their food sources (water soluble vitamins, fat soluble vitamins, and major and minor minerals); the relationship between alcohol and nutrition (the process of alcohol breakdown/metabolism in the body, effects of alcohol on health and effect of alcohol on nutrition); energy balance and weight control; fitness and nutrition; food choices as affected by religious beliefs, economics, family traditions, political, social and historical factors; meanings of food and food-related behaviours of cultures and the way these patterns influence food consumption patterns among each other; global perspectives in a comparative context on food ways, beliefs, habits and cultural practice models; globalization of eating patterns and the resistance to homogenizing forces; international frames on long-standing and newly emerging issues focusing on causes and effects of famine; exploding populations and enhanced food production on current and future food supplies; nutritional value of diet; food system approach components of food production, distribution and cultural aspects; analysis of factors of food production (land, soil and technology); price of imports; and case studies.

Mode of Delivery:

1. lectures
2. group discussions
3. case studies
4. individual and work-based assignment

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes
2. Seminar paper and presentation
3. Continuous Assessment Test
4. Final examination

Core Reading Materials for the Course:

1. Whitney, E. N. and Sharon R. R. (2002).*Understanding Nutrition*. Wadsworth/Thomson.
2. Eastwood, M. (1997). *Principles of Human Nutrition.* 1st edition. Chapman & Hall
3. Garrow and James (1998). *Human Nutrition and Dietetics*. Edinburgh, London: Churchill Livingstone.
4. David, L. L. S. (Ed). (1995). *The Colour of Hunger: Race and Hunger in National and International Perspective.* Rowman and Littlefield.
5. Frances, M. L. and Joseph, C. (1986). *World Hunger Institute for Food and Development Policy*, Oakland, CA: Institute for Food and Development Policy.
6. World Hunger Programme. (1994). *World Food Security: Prospects and Trends.* Brown University.

Recommended Reference Materials:

1. Gary, A. T. and Kevin T. P. (2005). *The Human Body in Health and Diseases* (4th edition). Mosby.
2. Webb, G.P. (2002). *Nutrition: A Health Promotion Approach*. London: Arnold.
3. *Political Economy of Hunger*. (1995). Oxford: Clarendon Press.
4. World Hunger Programme. *Myths of African Hunger*. Brown University.
5. Brave New Third World. (1989). *Strategies for Survival in Global Economy*, Oakland, CA: Institute for Food and Development Policy.

Title of Course: NUT 216: Principles of Animal Production - 45 Contact Hours

Purpose of Course:

The purpose of this course is to develop general skills and knowledge of the principles of efficient production including, feeding practices, breeds, management, housing, marketing, diseases and sanitation under tropical conditions.

Expected Learning Outcomes:

At the end of the course, the students will able to:

1. Identify and describe breeds of cattle, sheep, swine, and goats.
2. Demonstrate the ability to select breeding stock by using performance records, visual evaluation, and other tools used in selecting livestock.
3. Demonstrate husbandry abilities such as castrating, dehorning, medicating, palpating, ear tattooing, and tagging.
4. Demonstrate the ability to calculate performance data.
5. List the major diseases of livestock and explain the methods of disease control.
6. Discuss the environmental impact of livestock production and ways of controlling all types of livestock pollution.

Course Content:

The topics to be covered includes: animal contribution to human needs; overview of livestock industry; red meat products; poultry and egg products; milk and milk products; visual evaluation of slaughter; red meat animals; market classes and grades of livestock; animal reproduction and genetics; artificial insemination; nutrition of farm animals; animal health; feeding of poultry, swine, goats, dairy cattle, and beef cattle; careers in animal science, animal welfare and rights.

Mode of Delivery:

1. lectures
2. group discussions
3. experiential learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. Continuous Assessment Tests 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Robert, E. T., Robert, W. T. and Taylor, R. E. (2003). *Scientific Farm Animal Production: An Introduction to Animal Science.* Prentice Hall.
2. Archana, R. (2008). *Principles of Agriculture and Food Production*. Oxford Book Company.
3. Srivastava, A. K. (2004). *Agriculture and Food*. Aph Publishing Corporations.
4. Ramniwas, Ed Sharma. (2006). *Agriculture and Food Safety*. Daya Publishing House.

Recommended Reference Materials:

1. Scientific Farm Animal Production. Taylor/Bogart. *Live Animal Carcass Evaluation and Selection Manual.*
2. Sreelata, M. (1999*). Food, Nutrition and Agriculture*: Crisis Management and Technological Innovation. Kanishka Publishers Distributors.
3. Arti B. (editor). (2008). *Food and Community Nutrition*. Anmol Publications Pvt.

Title of Course: NUT 221: Community Health - 45 Contact Hours

Purpose of Course:

The purpose of the course is to equip the learner with skills on management of the community's health status.

Expected Learning Outcomes:

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

1. Outline the history of health services in Kenya.
2. Describe the principles of communicable disease control and public health importance.
3. Describe the district health systems and it's strategies in relation to community health.

4. Explain the concept of disease in terms of environmental causes
5. Describe the community based health care approach.
6. Explain principles, methods and techniques of community and public health.

Course Content:
Topics to be covered include: the concepts of community and public health, historical development of community health in Europe, America, Kenya; methods of community health; strategies for implementing primary health care and the roles of various cadres; community based health care; health centre practice; management prevention and control of communicable diseases and chronic disease conditions; Provision of MCH/FP services for various age groups; immunization; mobilization and organization of groups for specific programmes; contributors to basic public health; history of health services in Kenya; diseases of public health importance in Kenya; environmental health; food hygiene; housing and public health; personal hygiene; primary health care; school health programme; disasters and epidemics.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment
5. Role plays
6. Demonstration
7. Community and health facility visits, partnership practice.

Instructional Materials:
1. A audiovisuals e.g. film shows
2. Posters,
3. Overhead projector,
4. LCD PowerPoint projector

Course Assessment:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:

1. Ahlbom, A., Novell, S. (1984). *Introduction to Modern Epidemiology*. Chestnut Hill, MA: Epidemiology Resources Inc.
2. Wood, C.H, Vaughan, J.P. and Glaniville, H. (editors) (1989). *Community Health*. Nairobi: African Medical and Research Foundation,
3. McMahen, R. B. E. and Piot, M. (1992). *On Being In Charge: A Guide for Mid-level Management in Primary Health Care.* Geneva: WHO.

Recommended Reference Materials:

1. McMurray, A. (1990). *Community Health Nursing: Primary Health Care in Practice.* Edinburgh: Churchill Livingstone.

2. Stanhope M. and Lancaster J. (2000). *Community Health Nursing: Process and Practice for Promoting Health.* 4th edition. St. Louis: The C.V. Mosby Co.
3. Basch, P. (1990). *Textbook of International Health*. New York: Oxford University Press.
4. Paul, B.D. (1955). *Health, Culture and Community*. New York: Russell Sage Foundation.

Title of Course: NUT 222: Therapeutic Nutrition and Dietetics 1 - 45 Contact Hours

Purpose of Course:
This course has been tailored to enable the student have hands on skills and the knowledge on how to modify various diets on depending on individual needs and conditions as a means of restoring health.

Expected Learning Outcomes:
This course is intended to enable students to:
1. Define the basic concepts in therapeutic nutrition and understand the principles involved.
2. Asses the nutrition status of an individual or group.
3. Apply the principles of therapeutic nutrition in feeding the sick.
4. Identify the symptoms of various diseases and their dietary consideration.
5. Describe the principles involved in food preparation and menu writing of various diseases.

Course Content:
This course will cover: the concept of health and diseases; definitions in therapeutic nutrition; the reasons and purposes of dietary treatments; the relationship between nutrition assessments and dietary therapy in patient care; nutrition counselling and the types of therapeutic diets; different disease conditions and their specific ways of management (fevers, diabetes mellitus, cardiovascular disorder and hypertension-coronary prone individuals, congestive heart failure; and gastrointestinal disorders, diverticulosis, and ulcers).

Mode of Delivery:
1. Lecture
2. Practical
3. Group work

Instructional Materials:
- Use of audiovisuals e.g. power-point, posters, overhead projector, etc

Course Assessment:
1. Continuous assessment tests
2. Final written examination

Core Reading Materials for the Course:
1. Robinson, C. H. and Lawler, M. (1982). *Normal and therapeutic Nutrition*. Macmillan.

2. Royal College of Physicians. *Nutrition and patients: a doctor's responsibility.* Report of a Working Party of the Royal College of Physicians of London. London: 11 St. Andrew's Place.
3. Ndekha, M.J., Manary, M. J., Ashorn, P., Brined, A (2005). *Home Based Therapy With Ready-To-Use Therapeutic Food is of Benefit to Malnourished, HIV-Infected Malawian Children.* Acta Paediatrica, Volume 94, number 2 pp. 222-225 (4).

Title of Course: NUT 223: Food Toxicology - 45 Contact Hours

Purpose of Course:
The course provides students with concepts of the toxic substances occurring in food, either naturally or formed during processing, and the toxic effects of these substances on the biological systems.

Expected Learning Outcomes:
By the end of the course, the learner should be able to:
1. Describe the biological and chemical aspects of toxicology, microbial aspects of food borne infections and intoxications, food additives, toxic substances occurring in food.
2. Discuss the mechanisms of action of specific food toxicants.
3. Discuss food allergies versus food toxicants.
4. Analyze data regarding potentially toxic food components by applying logic, statistical, chemical-analytical and other appropriate methods.
5. Define major modes of toxicity of key food borne toxicants, based on chemical nature, metabolism, and sites of action and toxicity mechanisms.
6. Design remediation and detoxification strategies for key food borne toxicants.
7. Appropriately assess human risk from food borne toxicants of current interest and major health significance.
8. Assess and modify HACCP plans to optimize prevention of food borne toxicities.

Course Content:
The topics to be covered in the course include: biological and chemical aspects of toxicology; microbial aspects of food borne infections and intoxications; food additives; toxic substances occurring in food naturally and during processing; the toxic effects of these substances on the biological systems; safety of genetically engineered foods; risk assessment and food safety policy; sources, pathways, receptors, and controls of target chemicals in the human food chain and human disease manifestation; chemical, natural or synthetic, fate and transport in the food system; toxicomechanics, toxicodynamics, toxicological endpoints in animals and humans; and the natural, engineered, or regulatory controls that aid in the mitigation of the exposure.

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Omaye, S. T. (2004). *Food and Nutritional Toxicology*, Boca Raton, FL: CRC Press LLC.
2. Asarett and Doull's (2001). *Toxicology: The Basic Science of Poisons*, 6th Ed. McGraw Hill.

Recommended Reference Materials:

1. National Audubon Society. (1984). *Environmental Toxicology Books, Reports and Journals: An Annotated Bibliography*. The Society.
2. Dana Lincoln Roth (1973). *Element/Compound Index to Selected Toxicology Books in the CIT Chemistry Library*. California Institute of Technology.

Title of Course: NUT 224: Cell Biology and Genetics - 45 Contact Hours

Purpose of Course:

This course facilitates a survey of fundamental biological principles to students.

Expected Learning Outcomes:

Upon the successful completion of this course, you should be able to:

1. Demonstrate knowledge of the similarities and differences among cells, how they are organized and work together.
2. Compare and contrast structures of prokaryotic and eukaryotic cells and understand the Significance of these differences in patterns of evolution and treatment of disease.
3. Contrast relationship between the structure of organelles and their function.
4. Demonstrate knowledge of the biological processes involved in the transmission of characteristics of an organism to its offspring.
5. Demonstrate knowledge of the principles of the theory of evolution.
6. Demonstrate knowledge of the structure and function of plant and animal cells, tissues, organs and organ systems.
7. Develop laboratory skills related to cell biology techniques, equipment, instruments and projects.

Course Content:

Topics to be covered include: introduction to cell genetics and biology; cell types and cell components (DNA to RNA, the nucleus, RNA to proteins, endoplasmic reticulum, golgi apparatus, lysosomes, mitochondria, chloroplasts, Cytoskeleton, and Peroxisomes); cell membranes (membrane lipids, membrane proteins, membrane transport, axonal transport Ion channels, axonal transport and electrical activity); DNA replication, genetics, heredity, evolution, the cell cycle, intercellular contacts and communication; Tissues, extra cellular matrix, muscle, stem cells, cancer; tissue culture of mammalian cells; Western, Northern and Southern blotting; *in situ* hybridization; PCR amplification; DNA sequencing; polyclonal and monoclonal antibody production and testing.

Mode of Delivery:

1. Lecture
2. Practical
3. Group work

Instructional Materials:

Use of audiovisuals e.g. power-point, posters, overhead projector, etc

Course Assessment:

1. Continuous assessment tests
2. Final written examination

Core Reading Materials for the Course:

1. David, K. A. *Guide to the Natural World* Third Edition. Prentice Hall.
2. Alberts, et al., (2004). *Essential Cell Biology*, 2nd Edition.
3. Karp, (2008). *Cell and Molecular Biology* 5th Ed. Wiley Publ. Co
4. Gerald, K. (2005). *Cell and Molecular Biology*, 4th edition, John Wiley and Sons, Inc.

Recommended Reference Materials:

1. Crafts-Lighty. (1983). *Information Sources in Biotechnology*. Macmillan Publishers.
2. Eduardo D. P. De Robertis, Wiktor W. Nowinski, Francisco Alberto Sáez. (1965). *Cell Biology*. Saunders- the University of Michigan.
3. British Medical Association. (1970). *Journal of Medical Genetics*, Volume 7. British Medical Association publishers.

Title of Course: NUT 225: Food Microbiology I- 60 Contact Hours

Purpose of Course:

To allow students review current issues in food microbiology.

Expected Learning Outcomes:

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

1. Discuss the key events in the history of food microbiology.
2. To recognize how extrinsic and intrinsic factors influence microbial growth and survival in foods.
3. To enumerate micro-organisms, and to evaluate the strengths and weaknesses of various methods to enumeration based on the food analyzed and the expected microbial population and load.
4. Describe how food-borne disease has evolved and how regulatory systems have developed to control risks in the food supply.
5. To develop specific knowledge of the tools, approaches, and considerations required to develop a HACCP plan for industry application as part of a quality assurance programme.
6. To utilize the concept of indicator organisms and understand the implication of their presence in food systems. Students will also have a working knowledge of MPN techniques and the principles behind the new technologies used for detection of food-borne micro-organisms.

Course Content:
The topics to be covered include: classification of bacteria and fungi; morphology and structure, nutrition, metabolism and growth of bacteria and fungi; staining techniques used in microbiology; bacterial pathogenicity; analysis of the bacterial cell; key events in the history of food microbiology; food as a substrate for microbial growth; habitats, taxonomy and factors affecting microbial growth; Hurdle concept; microbial growth and counts (meaning, determination, media, differential counts, total counts and indicator organisms); the calculation and application of MPN's and introduction to rapid methods; diagnostic laboratory techniques; biotechnology in the diagnosis and epidemiology of microbial diseases; sterilization and disinfection; safety in microbiology laboratory; quality control procedures in microbiology; principles of vaccine production; standardization of biological products by microbiological and serological methods; microbial genetics, gene transfer and recombinant DNA technology; virology (viral morphology and characteristics, morphological grouping of viruses, viral proteins/glycoprotein, genetic differences between viruses, growth and purification).

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:
1. Overhead projector
2. LCD PowerPoint presentation

Course Assessment:
1. Quizzes
2. Seminar paper and presentation
3. CAT
4. Final examination

Core Reading Materials for the Course:
1. George J. B. *Basic Food Microbiology*. AVI Publishing Company Inc.
2. Blackburn, C. W. and McClure, P. J. (2009). *Food Pathogens: Hazards, Risk Analysis and Control*, 2nd Edition. CRC Press.
3. Adams, M. R. and Moss, M O. (1995*). Food Microbiology*. New Age International Publishers.
4. Bibek, R. (2004*). Fundamental Food Microbiology*. CRC press.
5. Tauro, P., Kapoor, K. K. and Yadav, K. S. (1986). *An Introduction to Microbiology*. New Age International Publishers.

Recommended Reference Materials:
1. Schlegel, H. S., Zaborosch, C., Kogut, M.(1993). *General Microbiology*. Cambridge University Press.
2. Heinz, Stol. (1996). *Microbial Ecology: Organisms, Habitats, and Activities*. Cambridge University Press.
3. Banwart, George. *Basic Food Microbiology*.

Title of Course: NUT 226: Biostatistics -- 45 Contact Hours

Purpose of Course:
The course aims at using statistical techniques to analyse real datasets. This involves identifying the most appropriate statistical techniques; applying those techniques using the statistical computing package SPSS, and interpreting the resulting output.

Expected Learning Outcomes:
By the end of the course the learner should be able to:

1. Use exploratory data analysis techniques to investigate the main feature of dataset.
2. Explain the assumptions underlying simple linear regression, recognise situations where data transformation is appropriate, and perform appropriate transformation using SPSS.
3. Fit multiple linear regression and logistic regression models in SPSS and interpret the results.
4. Explaining statistical concepts and reasoning behind the techniques to be applied using computer labs.
5. Analyse datasets.

Course Content:

The course topics will include: the relationship between a response variable and a predictor variable; using simple linear regression; transformations of the response and /or predictor; advanced regression modelling techniques, including multiple regression and logistic regression to the analysis of a real dataset.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Seminar paper and presentation
2. Continuous Assessment Tests
3. Final examination

Core Reading Materials for the Course:

1. Heath, D. (1995). *An Introduction to Experimental Design and Statistics for Biology*, London: UCL Press.
2. Campbell, S. K. Heath, D. (1995). *An Introduction to Experimental Design and Statistics for Biology*, London: UCL Press.
3. Campbell, S. K. (1974). *Flaws and Fallacies in Statistical Thinking*, Prentice-Hall.

Recommended Reference Materials:

1. Gonick, L. and Smith, W. (1993). *The Cartoon Guide to Statistics.* Harper Perennial.

2. Moses, L. E. (1986). *Think and Explain with Statistics.* Addison Wesley.
3. Salsburg, D. S. (1974) .*Understanding Randomness.* Lecture Notes in Statistics, Vol. 6.
4. Fisher, R. A. (1971) .*The Design of Experiments.*

Title of Course: NUT 228: Partnership II -- 300 Contact Hours

Purpose of Course:
The purpose of the course is to equip the students with skills on intervening on community nutrition management based on the community diagnosis results.

Expected Learning Outcomes:
By the end of this module students will be able to:
1. Demonstrate the process of community and /or institutional diagnosis.
2. Develop an action plan for improvement based on the community diagnosis findings.
3. Implement the action plan.
4. Monitor and evaluate the implementation of the action plan.

Course Content:

Topics will include: Introduction to partnerships in health and development (principles, levels and methods); participatory methods; TICH Partnership Model; conducting a community diagnosis; designing of interventions and participatory implement the action plan.

Mode of Delivery:
1. Group discussions
2. Case studies
3. Individual and work based assignment
4. Assignment of mentors for follow-up, support and assessment in partnership practice

Instructional Materials:
1. Community and service partnership site
2. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
1. Practical assessment in the community of practice (20mks)
2. Immediate supervisor assessment (20mks)
3. Partnership Practice II report (60mks)

Core Reading Materials for the Course:

1. Ocholla-Ayayo, A. B. C. (1991). *The Spirit of a Nation.* Nairobi: Shirikon Publishers
2. TICH. *Partnership Practice Manual*. Unpublished.
3. TICH (2003). The *Quest for Equity in Access to Health and Development: Scaling. Up of Best Practices in Decentralized District Systems*. Nairobi: TICH.

Recommended Reference Materials:

1. Population Studies and Research Institute (2001). *Population, Health and Development in Africa*. Nairobi: Impress Communications.
2. Taylor-Ide, D. and Taylor, C. (2002). *Just and Lasting Change: When Communities Own Their Futures. Baltimore:* The John Hopkins University Press.
3. Ikiara, Moses M. (2001). *Vision for long term Development.* Nairobi: Kenya Institute for Public Policy Research and Analysis.
4. Narayan, D. et al (2000). *Can Anyone Hear us? Voices of the poor*. New York: Oxford University Press.
5. Narayan, D. et al (2000). *Crying out for Change: Voices of the Poor*. Washington, D.C: World Bank.

Title of Course: NUT 311: Therapeutic Nutrition and Dietetics 11-45 Contact Hours

Purpose of Course:

This course has been tailored to enable the student have hands on skills and the knowledge on how to modify various diets on depending on individual needs and conditions as a means of restoring health.

Expected Learning Outcomes:

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

1. Explain the principles of therapeutic nutrition in feeding the sick such as patients with liver disorders, renal disorders, surgical conditions, nutrition and cancer, nutrition and HIV.
2. Identify the symptoms of various diseases and their dietary consideration.
3. Apply the principles involved in food preparation and menu writing of various diseases e.g. low calorie, regular; soft liquid or restriction of pre-operative diets.

Course Content:

The topics to be covered in the course include: various conditions and their dietary considerations including the disease aetiology; liver disorders (function of the liver, aetiology of disorders and malnutrition considerations); aetiology, symptoms and dietary modification of cirrhosis, hepatitis and hepatic coma; renal disorders (renal functions**,** aetiology symptom and dietary modification of acute and chronic glomelonephritis and renal failure); surgical conditions (nutritional considerations, tube feeding and parenteral feeding, diet following surgery on mouth-throat-oesophagus, Diets following gastrectomy i.e. burns); nutrition and cancer; nutrition and HIV.

Mode of Delivery:

1. Lecture
2. Practical
3. Group work

Instructional Materials:

1. Use of audiovisuals e.g. power-point, posters, overhead projector, etc

Course Assessment:

1. Continuous assessment tests
2. Final written examination

Core Reading Materials for the Course:

1. Robinson, C. H. and Lawler, M. (1982). *Normal and therapeutic Nutrition*. Macmillan
2. Royal College of Physicians. *Nutrition and Patients: A Doctor's Responsibility*. Report of a Working Party of the Royal College of Physician of London. London: 11 St. Andrew's Place.
3. Ndekha, M. J., Manary, M. J., Ashorn, P., Brined, A. (2005). *Home Based Therapy with Ready-To-Use Therapeutic Food is of Benefit to Malnourished, HIV-Infected Malawian Children*. Acta Paediatrica, Volume 94, number 2 pp. 222-225 (4).
4. FANTA. (2000). *HIV/AIDS: A Guide for Nutritional Care and Support*. Washington DC: FANTA Project, Academy for Educational Development.
5. Heller stein, M and D Kotler. (1998). *HIV-Associated Wasting Syndrome and Body-Habitus Changes*. *PRN Notebook* 3(3): 14-21.

Recommended Reference Materials:

1. Kotler, D. (2000). *The Epidemiology and Pathogenesis of Lipodystrophy in HIV Disease: An Update*. PRN Notebook 5(1): 9-13.
2. Piwoz, E. G. and Preble, E. A. (2000). *HIV/AIDS and Nutrition: A Review of the Literature and Recommendations for Nutritional Care and Support in Sub-Saharan Africa*. Washington, DC: SARA Project, Academy for Educational Development.
3. Republic of South Africa Department of Health. (2001). *South African National Guidelines on Nutrition for People Living with TB, HIV/AIDS, and other Debilitating Conditions*. Pretoria.

Title of Course: NUT 312: Epidemiology and Health -- 45 Contact Hours

Purpose of Course:

The main purpose of this course is to provide the students with the skills and knowledge in epidemiology that would enable the tackle the various aspects of public health.

Expected Learning Outcomes:

This course has been designed to enable the student to

1. Learn the basic principles and methodologies in epidemiology.
2. Apply the skill in epidemiological researches.
3. Plan and design health promotion and education programmes in the community

Course Content:

The topics to be covered include: Definition of epidemiology and related terms; history and evolution of epidemiology; the scope and work field and limitations of the discipline of epidemiology; the importance of a 'population at risk'; disease control; concepts of disease and health; epidemiological concepts; concepts of disease control-screening; the basic principles of screening and surveillance; sensitivity, specificity and predictive values of tests; simple calculations of test indices; the role of prevalence in the performance of a test; scope of health promotion and preventive medicine intervention; classification of disease/health and medical conditions; developing health indicators and measurements of health and related issues to assess effects and impacts of interventions.

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes
2. Seminar paper and presentation
3. Continuous Assessment Test
4. Final examination

Mode of Delivery:

1. Didactic lectures
2. Interactive discussions
3. Group work
4. Home study

Core Reading Materials for the Course:

1. Charles H. and Julie B. *Epidemiology in Medicine*.
2. Kenneth, R. *Principles of Epidemiology*.
3. Arnold, G. J. *Modern Infectious Disease Epidemiology.*

Recommended Reference Materials:

1. Saunder, W. B., Mausner and Kramer, (1995). *Epidemiology*: an introductory text.
2. Baker and Hall. (1991). *Practical Epidemiology*, Churchill Livingstone.
3. Beaglehole, B. and Kjellstrom, (1993). *Basic Epidemiology*, WHO.

Title of Course: NUT 313: Food Preparation and Nutrition -- 45 Contact Hours

Purpose of Course:

Students will have a strong understanding of food preparation as well as safe food handling practices.

Expected Learning Outcomes:

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

1. Demonstrate nutrition and wellness practices that enhance individual and family well-being.
2. Analyze factors that influence dietary and wellness practices across the life span.
3. Evaluate the nutritional needs of individuals and families in relation to health and wellness across the life span.
4. Evaluate factors that affect food safety, from production through consumption.
5. Integrate knowledge, skills, and practices required for careers in food production, food distribution, food services, food science, nutrition, dietetics, and hospitality, tourism and Recreation.
6. Demonstrate the principles of nutrition and food preparation to meet customer/client needs.
7. Demonstrate the use of current technology as it relates to the food and hospitality industries.
8. Demonstrate procedures applied to safety, sanitation, security, and environmental issues.

Course Content:

The topics to be covered will include: the role of food in the body (review of essentials nutrients and dietary guidelines, the digestion of food); nutrition and physical fitness

(influences of food selection, ideal body weight, food–related illnesses, malnutrition, anorexia, bulimia); exercise and fitness, weight loss, weight gain and weight maintenance plans; food facts and fallacies (controlling fats, salts and sugar, vitamin supplements); skills and techniques of food preparations (review laboratory procedures, kitchen equipment- microwaves, cut tools, portable electrical appliances); purchasing food (marketing strategies, advertising and coupons, shopping lists, selecting a store, consumer rights and responsibilities); foundations of nutritious food preparation (soups, stocks, and sauces, salads and salad dressing, eggs, poultry, fish, the basics of baking, functions of ingredients, baking equipment and storage, preparations of nutritious bakery items); careers in food and nutrition, career exploration and career suitability.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Case Studies
4. Work-Based Assignment

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:

1. Gladys C. Peckham. (1974). *Foundations of Food Preparation 3d ed*. New York: Macmillan.
2. Paul P. (2002). *Asian Traditions and Modern Nutrition* 3rd edition North Atlantic Books.
3. Campbell, T. C. and Thomas M. C. (2006). *The Most Comprehensive Study of Nutrition Ever Conducted and the Startling Implications for Diet, Weight loss and Long-term Health.* Ben Bella Books.

Recommended Reference Materials:

1. Sandor. E. K. (2003). *The Flavour, Nutrition, and Craft of Live-Culture Foods* 2003 Chelsea Green.
2. Charles. E. (2003). *Transcending Diets and Dogma to Nourish the Natural Self 2nd edition*: New Trends Publishing.
3. Jessica P. (2006). *Food and the Hunger for Connection* Chelsea Green.

Title of Course: NUT 314: Entrepreneurship -- 45 Contact Hours

Purpose of Course:

The purpose of the course is to equip the students with skills in entrepreneurship for managing the prevailing economic situations for optimal nutritional care.

Expected Learning Outcomes:
By the end of the course, the students will be expected to:

1. Define entrepreneurship within the context of society, organizations and individuals.
2. Demonstrate an understanding of the impact of entrepreneurship on the economy. entrepreneurial attitudes and behaviours within him/herself and others.
3. Distinguish between an entrepreneurial and a conventional approach to management.
4. Recognize and overcome obstacles to creative problem-solving.
5. Describe the elements of an effective business model/plan.
6. Develop a concept for an innovative product or service in his or her own area of interest.

Course Content:
The topics to be covered will include: the concept of sustainable entrepreneurship; the history of entrepreneurship, the role of entrepreneurs and entrepreneurs in the 21st century global economy; and the identification of entrepreneurial opportunities; elements of creative problem-solving; the development of a business concept/model; the examination of feasibility studies; and the social/moral/ethical implications of entrepreneurship; overcoming obstacles; selling your idea to others; the entrepreneurial management process; opportunity and the entrepreneur; recognizing and testing opportunity; developing and testing the business concept; building a team; analyzing and testing opportunity (industry, customer, product/service, financial and legal risks); preparing for future growth; business concepts/models.

Mode of Delivery:

1. Lectures
2. Seminars
3. Practical

Instructional Material:

1. Use of Audiovisuals such as power point, posters, overhead projector etc

Course Assessment:

1. Continuous Assessment Tests (CATS)
2. Class assignments
3. Final written examination

Core Reading Materials for the Course:

1. Kuttner, R. (1996). *Everything for Sale: The Virtues and Limits of Markets*. Chicago. University of Chicago Press.
2. LeGrand, J. & Robinson, R. (1993). *The Economics of Social Problems:* The Market versus the State (3rd edition), London: Macmillan.
3. Rhoads, S. E. (1985). *The Economist's View of the World: Governments, Markets, and Public Policy*. Cambridge: Cambridge University Press.

Recommended Reference Materials:

1. Staveren, I. V. (2001). "*The Missing Ethical Capabilities of Rational Man" and "Toward an Aristotelian Perspective' in the Values of Economics: An Aristotelian Perspective.* London: Macmillan.

2. Stretton, H. and Orchard, L., (1994). *Public Goods, Public Enterprise and Public Choice*: Theoretical Foundations of the Contemporary Attack on Government. London: Macmillan.
3. Wuyts, M., Mackintosh, M. and Hewitt T. eds. (1992). *Development Policy and Public Action*. Oxford: Oxford University Press.

Title of Course: NUT 315: Nutrition Care and Assessment through the Life Cycle -- 45 Contact Hours

Purpose of Course:
A critical survey of the methods used in the assessment of food and nutrients intakes and nutritional status of communities, groups and individuals, in both health and disease, including some of the breastfeeding policies.

Expected Learning Outcomes:
At the end of the course, the students will be able to:

1. Understand the principles and practicalities of the variety of methods used in assessing food /nutrient intake and nutritional status.
2. Evaluate these methods in terms of strengths, limitations and appropriateness for particular populations, individuals, clinical situations and study designs.
3. Complete exercises to practice doing nutritional screening, dietary and nutritional assessment of individuals in different situations.
4. Gain knowledge in nutritional needs throughout stages of the life cycle including pregnancy and lactation, infancy, adolescence and aging, socioeconomics, cultural and psychological influences of food and nutrition behaviour.
5. Develop practical skills, critical thinking, and team work and communication skills.

Course Content:
This covers: the concepts of malnutrition in relation to the stages of life; nutrition assessment; definition, purpose, types, components, ABCD findings, medical history, characteristics of the ideal nutrition; assessment method, nutrition screening and risk assessment; scored PG-SGA and nutrition interview; clinical and physical examination with a nutrition focus; anthropometry and body composition; dietary assessment; laboratory assessment; the nutritional and dietary assessment in diverse cultures and communities (vegetarians, Jewish, Hispanic, Aboriginal); nutritional assessment across the lifecycle (pregnancy, lactation, infants, children, adolescents, adults, elderly); socioeconomic, cultural and psychological influences of food and nutrition behaviour; breastfeeding practice and policy.

Mode of Delivery:

1. lectures
2. group discussions
3. experiential learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes
2. Seminar paper and presentation
3. Continuous Assessment Test
4. Final examination

Core Reading Materials for the Course:

1. Lee, R. D., and D. C. Nieman. (2007). *Nutritional Assessment.* 4th Edition, McGraw-Hill Higher Education, Toronto, Ontario.
2. Brown, J. E., (2005). *Nutrition through the Life Cycle*. 2nd edition Thompsons publishers, Australia.
3. Williams and Wilkins. (2008). *Recent pocket size medical dictionary, such as the Stedman's Medical Dictionary for the Health Professions and Nursing* (6th Edition) Lippincott.

Recommended Reference Materials:

1. Giroux, I. (2008). *Applications and Case Studies in Clinical Nutrition*. Lippincott Williams & Wilkins, Baltimore, MD.
2. Health Canada. (2008). *Nutrient Value of Some Common Foods*. Minister of Health Canada, Ottawa, Ontario. (Available at http://www.hc-sc.gc.ca).
3. Pagana, K.D., and Pagana, T.J. (2008). *Mosby's Diagnosis and Laboratory Test Reference*. 9th Edition. Elsevier Mosby, St. Louis, Missouri.

Title of Course: NUT 316: Research Methods -- 45 Contact Hours

Purpose of Course:

This course introduces the process of scientific inquiry and the application of appropriate research methods to address questions relevant to public health. It equips students with the basic knowledge and skills required to critically appraise and practice health research.

Expected Learning Outcomes:

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

1. Provide the basic knowledge; skills and competencies required to design, conduct, and report and evaluate public health research.
2. Describe critical examination of the scientific research process, the philosophical and ethical aspects of health research, elements of research design, the collection, compilation and management of health data.
3. Discuss the roles of qualitative and quantitative methods in health research.
4. Provide the basis for critically appraising research proposals and reports.

Course Content:

The content of this course will include the following topics: introduction to public health research methods; overview of the scientific research process; identifying research topics and reviewing the literature; introduction to epidemiology; designing and implementing data collection; compiling and managing data; quantitative methods- data analysis and statistical computing; qualitative research designs; critically appraising research; philosophical and ethical issues in health research and indigenous research methods.

Mode of Delivery:

1. lectures
2. group discussions
3. computer labs

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Development of a research proposal 25%
2. Development of a research instrument and data collection 25 %
3. Analysis and report on research survey 50%

Core Reading Materials for the Course:

1. Bowling, A. (1997). *Research Methods in Health*, Buckingham: Open University Press.
2. Abramson, J. H. (1984). *Survey Methods in Community Medicine: An Introduction to Epidemiological and Evaluative Studies*. Edinburgh: Churchill Livingston.
3. Beaglehole R., Bonita R. Kjellstrom T. (1993). *Basic Epidemiology*. World Health Organisation.
4. Carmines, E. G. and Zeller, R. A. (1988). *Reliability and Validity Assessment*. Beverley Hills: Sage Publications.
5. Daly, J. et al. (1997). *The Public Health Researcher: A Methodological Guide.* Melbourne: Oxford University Press.

Recommended Reference Materials:

1. Field, P. A. and Morse, J. M. (1985). *Nursing Research: The Application of Qualitative Approaches.* London: Chapman and Hall.
2. Hennekens, C. H. and Burring, J. E. (1987). *Epidemiology in Medicine*. Little Brown.
3. Huck S. W., Cormier W. H. (1996). *Reading Statistics and Research*. Harper Collins.
4. Jekel, J. F., Elmore, J.G. and Katz, D.L. (1996). *Epidemiology, Biostatistics and Preventive Medicine*. Saunders.
5. Kazdin, A. E. (1982). *Single Case Research Designs: Methods for Clinical and Applied Settings*. New York: Oxford University Press.
6. Moser, C. A. and Kalton, G. (1986). *Survey Methods in Social Investigation*. Vermont: Gower Publishing Company.
7. National Health and Medical Research Council. (1988). *NHMRC Statement on Human Experimentation and Supplementary Notes*.
8. Polgar, S. (2000). *Introduction to Research in the Health Sciences*. 4th edition. London: Churchill Livingston.
9. Schwartz, M. and Polgar, S. (2003). *Statistics for Evidence-Based Health Care*. Melbourne: Tertiary Press.
10. Spilker, B. (1991). *Guide to Clinical Trials*. New York: Raven Press.

Title of Course: Nut 317: Human Nutrition II -- 45 Contact Hours

Purpose of Course:
The purpose of this course is to enable student have the knowledge on the metabolism, transformation and interaction of nutrients within the cell of a living human organism.

Expected Learning Outcomes:
By the end of this course, the student should be able to:

1. Describe the structure, function, digestion, transport, storage, and metabolism of the nutrients.
2. Identify the key metabolic pathways in the utilization of macronutrients as well as the interrelationships among nutrients in metabolism.
3. Describe the basis of human nutrient deficiencies and excesses.
4. Evaluate current and recommended nutritional practices.
5. Explain the complementary and alternative nutrition, herbal therapies, and dietary supplements.

Course Content:
The topics to be covered in this course include: an overview of the cell; strategy of metabolic oxidation; ATP regeneration (riboflavin, niacin); carbohydrate metabolism and intermediary metabolism; fuel use during exercise; fibre; lipids (lipoproteins and cholesterol, lipids oxidation and synthesis); diet and heart disease; protein and amino acids (protein metabolism (B-6), nutrigenomics, protein quality and requirements); interpreting nutrition research; integration and regulation of metabolism; aetiology of obesity; alcohol metabolism; water-soluble vitamins (C, folic acid, B-12); fat-soluble vitamins and minerals.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Seminar paper and presentation
2. Continuous Assessment Tests
3. Final examination

Core Reading Materials for the Course:

1. Whitney, E. N. and Rolfes, S. R., (1999).*Understanding Nutrition*. 8th ed. Belmont: West/wadsworth.
2. Stipanuk, H. M. (2000). *Biochemical and Physiological Aspects of Human Nutrition*. Philadelphia: W. B. Saunders Company.
3. Vander, J. S., and Dorothy, L. (2001). *Human physiology: the Mechanism of Body Function*. 7th ed. Boston: McGraw-Hill.

Recommended Reference Materials:

1. Gropper, S. and Groff. *Advanced Nutrition and Human Metabolism*, 4th ed.

Title of Course: NUT 318: Food Microbiology II -- 60 Contact Hours

Purpose of Course:
The students will learn the interrelationships of micro-organisms with foods and their role in food manufacture, food spoilage, and food safety. As a result of studying either of these courses, students will be able to predict the impact of food processing and food handling on the microbiology of food.

Expected Learning Outcomes:
By the end of the course students should be able to:
1. To integrate knowledge to predict the spoilage and safety of meat and meat products, and milk and milk products.
2. To predict the spoilage and safety of egg and egg products, and fruits and vegetables.
3. Apply the principles underlying pre and probiotics in the food industry.
4. To describe the principles of microbial death and know how to apply these processes in the control of micro-organisms in foods. Students will be able to do all relevant calculations, including D- and Z-values, and be able to apply them to practical situations.
5. Describe methods to control micro-organisms in foods.

Course Content:
The topics to be covered in this course: current issues on food spoilage, food-borne microbial disease; food and beverage fermentations; the use of micro-organisms as processing aids; sources of food ingredients and additives; commodity groups, industry structure, food properties and processing operations; commodities such as dairy products, fruit and vegetables, meat products, and alcoholic beverages; advanced concepts of microbial taxonomy, biochemistry, physiology, detection and enumeration; the use of micro-organisms as sources of colours, flavours, polysaccharides, vitamins, amino acids and probiotics and biocontrol agents; microbial death; heat processing of foods (pasteurization, sterilization, injury and heat shock); food preservation (irradiation, chemical preservatives and bio-preservation of foods); food preservation and the emergence of resistant bacteria.

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Quizzes
2. Seminar paper and presentation

3. CAT
4. Final examination

Core Reading Materials for the Course:

1. Blackburn, C. W. and McClure, P. J. (2009). *Food Pathogens: Hazards, Risk Analysis and Control*, 2nd Edition CRC Press.
2. Adams, M. R. and Moss, M. O. (1995). *Food Microbiology*. New Age International publishers.
3. Bibek Ray. (2004). *Fundamental Food Microbiology*. CRC press.
4. Tauro, P., Kapoor, K. K. and Yadav, K. S. (1986). *An Introduction to Microbiology*. New Age International publishers.

Recommended Reference Materials:

1. Schlegel, H. S., Zaborosch, C., Kogut, M.(1993). *General Microbiology*. Cambridge University Press.
2. Heinz Stol. (1996). *Microbial ecology: organisms, habitats, activities*. Cambridge University Press.
3. Banwart, George. *Basic Food Microbiology*.

Title of Course: NUT 319: Food Processing and Product Development I -- 45 Contact Hours

Purpose of Course:

To enable student evaluate product through a range of chemical, sensory and mechanical analyses. It will also provide an opportunity for students to develop a food product, using their training in Food Science and related disciplines. The course will establish effects of food processing on the nutritional quality of foods. It will also provide an opportunity for students to develop a food product, using their training in food science and related disciplines.

Expected Learning Outcomes:

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

1. Illustrate the nature of foods and their interaction with natural & synthetic food additives. Evaluate the chemical reactions and energy transformations in food processing.
2. Outline the basic principles underlying the methods used in food processing.
3. Analyze major emerging issues facing food production and the trends in processing science and technology being developed to solve emerging problems.
4. To establish effects of food processing on the nutritional quality of foods.
5. To determine the effects in of refining, heat processing, preservation, fermentation, radiation and packaging.
6. Development of new processes and products.
7. Outline the roles of effective food packaging and material structures play in the safety, distribution, selling, storage and consumption of food products.
8. Analyze a market and develop an appropriate new food product.

Course Content:

Principles of various food processing techniques: Evolution of food processing from traditional culinary techniques, popular commercial food processing methods , such as

thermal processing, cryogenic methods & concentration methods will be discussed, recent advancement such as irradiation, microwave heating & modified atmosphere will also be discussed.

Basic Food chemistry: Chemistry concepts, structure of matter, chemical reactions, and energy transformations, chemical versus physical changes, laboratory, the chemical detective matter in motion, lab-boiling point of mixtures, lab-enzymes.

The important relationship between food processing and nutrition; the stability of nutrients and their physiological functions in foods; nutritional quality of different food resources; as well as the effect of harvesting and storage.

Introduction to aspects of product development: processes and organizations; business modelling; product planning; identifying customer needs; product specifications; concept generation, selection and testing; product architecture; design for manufacturing; prototyping; robust design; intellectual property; product development economics; and managing projects.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Experiential Learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Practical
2. CAT
3. Final examination

Core Reading Materials for the Course:

1. Zdzislaw, E. S. (2001). *Chemical and Functional Properties of Food Proteins*. CRC Press.
2. Geankoplis, C. J. (1993). *Transport Processes and Unit Operations*. 3rd Edition. Prentice Hall, Englewood Cliffs, NJ.
3. Toledo, R.T. (1991). *Fundamentals of Food Processing Operations*. 2nd Edition. Van Nostrand Reinhold, New York, NY. [TP 371 T649 1991].
4. Howard Moskowitz, Sam Saguy and Tim Straus. (2009). *An Integrated Approach to New Food Product Development*. CRC press.
5. Gordon W. Fuller (2004). *New Food Product Development: From Concept to Marketplace*. CRC press.

Recommended Reference Materials:

1. Earle R.L. and M.D. Earle, *Unit Operations in Food Processing*. http://www.nzifst.org.nz/unitoperations/contents.htm
2. Mary D. Earle and Allan M. Anderson. (2001). *Food Product Development*. CRC press.

3. Bruce Traill and Klaus G. Gruner. (1997). *Product and Process Innovation in the Food Industry*. Blackley Academic and Professional, U.K.
4. Gordon L. R. *Food Packaging – Principles & Practice*. ISBN 0-8247-8749-8 Marcel Dekker, Inc. – available at college library.
5. Geankoplis, C.J. (1993). *Transport Processes and Unit Operations*. 3rd Edition. Prentice Hall, Englewood Cliffs, NJ. [TP 156 T7 G29 1993].
6. Toledo, R.T. (1991). *Fundamentals of Food Processing Operations*. 2nd Edition. Van Nostrand Reinhold, New York, NY. [TP 371 T649 1991].
7. Earle R.L. and M.D. Earle, *Unit Operations in Food Processing*. http://www.nzifst.org.nz/unitoperations/contents.htm

Title of Course: NUT 321: Clinical Nutrition -- 45 Contact Hours

Purpose of Course:
Introduce students to therapeutic nutritional care/service, modifications of normal diet to meet special nutritional needs, menu planning; documentation of nutritional care.

Expected Learning Outcomes:
At the end of the course, the students will be able to:
1. Demonstrate an understanding of the role of the Foods and Nutrition Services in nutrition management of patients/clients.
2. Demonstrate nutritional interviewing and counselling skills. Identify the nutritional implications of age, economics, physiological and socio-cultural characteristics of patients/clients.
3. Assess the quantity and quality of food available to individuals in hospitals, as well as develop an understanding of normal and therapeutic/modified diets.
4. Assess and monitor the nutritional status and needs that hospitalized patients have using appropriate tools and pertinent medical terminology. Be aware of the nutritional implications of drug-nutrient interactions.
5. Use the principles involved in planning and implementing nutrition care, including those necessary for the interpretation of nutrition data, the recommendation of appropriate diet orders and the implementation of physicians' orders.
6. Recognize the principles involved in menu planning for optimum nutrition of individuals in the disease state, including the use of a software programme in menu analysis and control.
7. Interpret nutritional prescriptions and translate standard therapeutic diet guidelines into daily food selections.
8. Exhibit knowledge about commercial supplements.

Course Content:
The topics to be covered will include: overview of clinical nutrition departments; role of the registered dietician; role of the dietetic technician; explanation of the case study assignment; food in the hospital; regular and modified diets; nutrition care process; nutrition care plan; medical record; multidisciplinary health care team; charting; nutrition interview; nutrition assessment; dietary assessment; estimation of dietary needs; nutrition education and counselling; code of ethics; quality of health care; clear liquid diet; blended liquid diet; oral nutritional supplements and formulas; mechanically altered diet; factors affecting food intake; diets for dysphasia; high-energy, high-protein diet, and eating disorders; obesity and weight management; nutrition management of diabetes mellitus; hands-on carbohydrate counting and menu planning; nutrition management of hyper-

lipidemias; fat-restricted diet, long-chain-triglyceride-restricted, medium-chain-triglyceride diet, lactose-controlled diet, fibre-restricted diet, high-fibre diet; sodium-restricted diets, protein-restricted diet, fluid-restricted diet, gluten-free diet.

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Three hours of lecture per week, plus supplementary readings and exercises assigned.
2. Students will be graded on written assignments (e.g. case study), two exams, and class participation.
3. An interactive approach to learning will include individual and group work, patient case studies requiring menu revisions, class discussions, and role-playing.
4. Emphasis will be placed on the mechanics involved and skills required to put theory into practice. Please bring a calculator to every lecture.
5. Final written examination.

Core Reading Materials for the Course:

1. Giroux, I. (2008). *Clinical Nutrition I Course Resources*. UWO Bookstore Custom Course Material, the University of Western Ontario, London, ON.
2. Giroux, I. (2008). *Applications and Case Studies in Clinical Nutrition*. Lippincott Williams and Wilkins, Baltimore, MD.
3. Pagana, K.D., and Pagana, T.J. (2008). *Mosby's Diagnosis and Laboratory Test Reference*. 9th Edition. Elsevier Mosby, St. Louis, Missouri.
4. *The Stedman's Medical Dictionary for the Health Professions and Nursing.* (6th Edition. (2008). Pocket size. Lippincott, Williams & Wilkins.

Recommended Reference Materials:

1. Steinecke, R. and College of Dieticians of Ontario. (2008). *The Jurisprudence Handbook for Dieticians in Ontario*. 2nd Edition. The College of Dieticians of Ontario, Toronto, Canada. (This document is available for consultation online at http://www.cdo.on.ca).
2. College of Dieticians of Ontario. (2004). *Record Keeping Guidelines for Registered Dieticians*. College of Dieticians of Ontario, Toronto, Ontario. (This document is available for consultation online at http://www.cdo.on.ca).
3. Canadian Diabetes Association. (2003). *Canadian Diabetes Association 2003 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada*. Canadian Journal of Diabetes 27 (Supplement 2), December 2003. (This document is available for consultation 3 online at http://www.diabetes.ca and can be purchased from the Canadian Diabetes Association at 1-800-BANTING or through their Web site).
4. Canadian Diabetes Association. (2005). *"Beyond the Basics: Meal Planning for Healthy Eating, Diabetes Prevention and Management."* (Poster resource). Canadian Diabetes Association, Toronto, Ontario.

Title of Course: NUT 322: Geriatric Nutrition- 45 Contact Hours

Purpose of Course:
The purpose of the course is to equip the students with knowledge on geriatric nutrition among the population.

Expected Learning Outcomes:
By the end of the course, the students should be able to:
1. Describe the historical and current studies on aging.
2. Identify the services available for the elderly.
3. Describe the food habits and nutrient needs of aging and aged people.
4. Explain the relationships between diet and other therapies for chronic disease among aged individuals.

Course Content:
The course topics will cover: demographic facts about elders, physiological, sociological, and psychological changes associated with aging; nutritional status in elders; food habits, nutritional assessment, nutrient requirements, dietary and nutritional status of elders; diseases or conditions common in elders; exercise for elders; the aging population; the oldest-old; newer information on under nutrition; nutrition screening; the aging and aged body; physiological, psychological and sociological changes; food habits; macro nutrients, micro nutrients and water; nutrition-related anemia; vitamin b12, folacin, vitamin b6, and iron; dementias of old age; liver function; diet-drug interactions.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:
1. Giroux, I. (2008). *Applications and Case Studies in Clinical Nutrition*. Baltimore, MD: Lippincott, Williams & Wilkins.
2. Mahan, L. K. and S. Escott-Stump, Editors. (2008). *Krause's Food & Nutrition Therapy*. 12th Edition. W.B. Saunders Company, Philadelphia, PA.
3. American Dietetic Association. *ADA Nutrition Care Manual*. Online resource available with subscription (http://www.eatright.org).
4. Brown, J. E. (2005). *Nutrition Now. 4th Edition*. Wadsworth Publishing, Thompson Learning, Belmont, CA.

Recommended Reference Materials:

1. Browner, F. (2003). *Nutritional Aspects and Clinical Management of Chronic Disorders and Diseases*. CRC Series in Modern Nutrition. New York: CRC Press.
2. Byham-Gray, L., and K. Wiesen. (2004). *A Clinical Guide to Nutritional Care in Kidney Disease.* The American Dietetic Association, Chicago, Illinois.

Title of Course: NUT 323: Nutrition Anthropology -- 45 Contact Hours

Purpose of Course:
The purpose of this course is to equip the learner with knowledge on various aspects of nutrition anthropology for management of diseases.

Expected Learning Outcomes:
By the end of the course, the learner should be able to:
1. Describe the origins of human biological variations and adaptations.
2. Analyse the human responses towards adapting to the environment.
3. Identify the bio-behavioural variations among human beings.
4. Describe the nutritional implications towards the human responses to the environment.

Course Content:
The course topics will include: life-span approach to diseases of aging; fertility variation during warfare; incremental growth; reproductive ecology in females and males; specialized diets in non-western populations; energetics of breastfeeding; lactase deficiency and human evolution; genetic adaptation and hypoxia; emerging infectious diseases and human variation; modernization and morbidity in non-western populations.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:
1. Stinson, S., Bogin, B., Huss-Ashmore, R and O'Rourke, D. (2000). *Human Biology*: *An Evolutionary and Bio-cultural Perspective.* Wiley-Liss, New York.
2. Frisancho, A. R. (1993). *Human Adaptation and Accommodation*. University of Michigan Press.
3. Mielke, J. H., Konigsberg, L. W. and Relethford. J. H. (2006). *Human Biological Variation*. Oxford University Press, New York.

Recommended Reference Materials:

1. Baker, P. T. (1997). *The Raymond Pearl Memorial Lecture, 1996: The Eternal Triangle – Genes, Phenotype and Environment.* American Journal of Human Biology. 9:93-101.
2. Cameron, N. and Demerath, E. W. (2002). *Critical Periods in Human Growth and Their Relationship to Diseases of Aging*. Yearbook. Physical Anthropology 45:159-184.
3. Crooks, D. (1995). *American Children at Risk: Poverty and Its Consequences for Children's Health, Growth, and School Achievement*. Yearbook. Physical Anthropology 38:57-86.
4. James, G. D. and Brown, D. E. (1997). *The Biological Stress Response and Lifestyle: Catecholamine and Blood Pressure*. Ann. Rev. Anthrop. 26:313-335.
5. Little, M. A. (1994). *Adaptation, Adaptability, and Multidisciplinary Research*. In: Biological Anthropology: The State of the Science, ed. by Noel T. Boaz and L.D. Wolfe. International Institute for Human Evolutionary Research, Bend.
6. Moore, L. G., Niermeyer, S. and Zamudio, S. (1998). *Human Adaptation to High Altitude: Regional and Lifecycle Perspectives*. Yearbook. Physical Anthropology. 41:25-64.
7. Weiss, K. M. (1998). *Coming to Terms with Human Variation*. Ann. Rev. Anthrop. 27:273-300.

Title of Course: NUT 324: Dietary Supplements & Herbal Remedies -- 45 Contact Hours

Purpose of Course:

The purpose of the course is to enable the students identify and use the dietary supplements and herbal remedies.

Expected Learning Outcomes:

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

1. Describe the use of herbal preparations and supplements as alternative therapies.
3. Explain the risks of herbal preparations and supplements.
4. Describe the difference between useful herbs and harmful herbs.
5. Counsel patients on the sensible way to use herbs and supplements.
6. Explain the impact of herbs, supplements and other phyto-medicinals on the practice of pharmaceutical care.

Course Content:

The course will deal only with natural products as purified therapeutic agents, such as the antibiotics and the anticancer natural products; it will not include crude drugs such as herbal preparations and phyto-medicinals (teas, tinctures, and extracts). The course content will entail: terminology and definitions; historical background; differences between herbs and other drugs; herbal and dietary supplements quality and dosage forms; rational herbalism and dietary supplements; herbal medicine and homeopathy; naturopathy and aromatherapy; herbs and the FDA; the harmful potential of herbs and other phyto-medicinals; the therapeutic use of phyto-medicinals; role of pharmacist.

Mode of Delivery:

1. Lectures

2. Group discussions
3. Case studies
4. Individual and work-based assignment
5. Partnership exercises: community entry and situation analysis
6. Assignment of mentors for follow-up, support and assessment in partnership practice

Instructional Materials:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
1. A term paper (30 marks.)
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:
1. Tyler, V. E., (1994). *Herbs of Choice: The Therapeutic Use of Phyto-medicinals.* Pharmaceutical Products Press, Binghamton NY.
2. Tyler, V. E., (1993). *The Honest Herba*l, 3rd ed., Pharmaceutical Products Press, Binghamton NY.
3. Huxtable, R. J., (1990). "*The Harmful Potential of Herbal and Other Plant Products,"* Drug Safety, 5, (Supplement 1), 126-136.
4. Gaus W. and Hogel, J., (1995*). "Studies on the Efficacy of Unconventional Therapies- Problems and Designs."* Arzneim Forsch/Drug Res., 45, 88-92.

Recommended Reference Materials:
1. Verhoef, M. J., Sutherland, L. R. and Birkich, L. (1990) "*Use of Alternative Medicine by Patients Attending a Gastroenterology Clinic."* Canadian Medical Association Journal, 142, 121- 125.
2. Eisenberg, D. M., Kessler, R. C., Foster, C, Norlock, F.E., Calkins, D. R. and Delbanco, T. L. (1993*). "Unconventional Medicine in the United States. Prevalence, Costs, and Patterns of Use,"* New England Journal of Medicine, 328, 246-252.

Title of Course: NUT 325: Food Service System Management -- 45 Contact Hours

Purpose of Course:
The purpose of this course is to equip the learner with the principles of management for quality food production.

Expected Learning Outcomes:
By the end of the course, the student should be able to:
1. Describe the concepts, principles and techniques of quantity food management.
2. Explain the roles and responsibilities of food service manager.
3. Apply the quantitative and qualitative standards in quantity food production.
4. Develop menus which meets staffing, equipment and nutritional constrains.
5. Describe the principles of purchasing and production in food service systems management

Course Content:
The course content will include: quantity food planning and management; definitions; classical principles of an organization chart; self appraisal on managerial know-how; pre-test and tools of management; theories of management; strategic management; functions of management; skills of managers; management activities and roles; principles of producing menu; functions and use of food service equipment; aspects of quantity food management; food safety and HACCP; cleaning, sanitation and safety; production; distribution in food service; labour control; facilities planning and design; and receiving storage and inventory.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Seminar paper and presentation
2. CAT
3. Final examination

Core Reading Materials for the Course:
1. Spears, C. M. (2000). *Food Service Organizations*. New Jersey. Prentice Hall.
2. Payne, P. et al., (2005). *Introduction to Food Service.* New Jersey: Prentice Hall.
3. Joan, B. K. and Linda, K. (1996). *Quantity Food Production and Management.* New York: Van Nostrand Reinhold.
4. Pannell, D. (1990). *School Foodservice Management*. New York: Van Nostrand Reinhold.

Recommended Reference Materials:
1. Holmberg, R. (1983). *Meal Management Today*. Illinois: Waveland press, Inc.
2. Mclean, B. B. (1964). *Meal Planning and Service*. Illinois: Chas. A. Bennett Co, Inc.
3. Kinder, Faye. (1962). *Meal Management.* New York: Macmillan Company, 1962.

Title of Course: NUT 326: Food Hygiene and Environmental Health I -- 45 Contact Hours

Purpose of Course:
The aim is to develop a level of understanding of the principles of food hygiene and environmental health.

Expected Learning Outcomes:
By the end of the course students should be able to:

1. Discuss the effects of food poisoning and contamination.
2. Describe the symptoms of food poisoning.

3. Discuss the effective methods of preventing food poisoning.

Course Content:
The topics to be covered in this course will include: food poisoning micro-organisms types and sources; simple microbiology; toxins, spores, growth and death; premises and equipment; common food hazards (physical, chemical, microbiological); personal hygiene (basic rules and responsibilities); preventing food contamination and poisoning; treating the symptoms and controlling the causes; cleaning and disinfection; effective temperature control of food (storage, thawing, reheating and cooking); waste disposal; cleaning and disinfection (materials, methods and storage); aspects of pest control; legal obligations.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Practical
2. CAT
3. Final examination

Core Reading Materials for the Course:
1. Rick, P. (2003). *Introduction to Food Science*, Thomson Delmar Learning.
2. Janet, D. W. (2002). *Principles of Food Science*, Goodheart/Willcox.
3. Brown, A. *Understanding Food, Principles & Preparation.*
4. Robert H. Friis. (2007). *Essential of Environmental Health*. Jones and Bartlett Publishers.

Recommended Reference Materials:
1. Jackson, M. H. (1989). *Environmental Health Reference* Book. London: Butterworth-Heinemann.
2. Ronald E. Hester, Roy M. Harrison. (2001*). Food Safety and Food Quality*. Royal Society of Chemistry.
3. Hester, R. and Harrison, R. (2001). *Food Safety and Food Quality-Academic Exchanges*. Royal Society of Chemistry.
4. Food Science. *The National Council of Agricultural Education.*
5. Lee, Frank. *Basic Food Chemistry.*
6. Banwart, George. *Basic Food Microbiology*.

Title of Course: NUT 327: Nutrition Education and Intervention in the Community -- 45 Contact Hours

Purpose of Course:
The purpose of the course is to equip the learner with nutrition education concepts for health promotion.

Expected Learning Outcomes:
By the need of the course, the student should be able to:

1. Describe the concepts in nutrition education and promotion.
2. Explain the roles of community nutrition in preventing disease, promoting health and controlling health care costs.
3. Analyze individual and environmental determinants shaping nutrition behaviours.
4. Design nutrition education programmes.
5. Describe the importance of policy in community nutrition.

Course Content:
The course will include descriptions of communities and nutrition: African Context for Community Nutrition, population health and health promotion and demographic and health trends. It will also include introduction to Programme Planning, Community Nutrition and Situational Assessment

Mode of Delivery:
1. Lecture
2. Discussion
3. Group exercises.

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Seminar paper and presentation
2. CAT
3. Final examination

Core Reading Materials for the Course:

1. Obesity or Canadian Population Health Initiative, (2004). *Improving the Health of Canadians, Chapter 5: Obesity.* Ottawa, Canadian Institution for Health Information: 107-147. Recommendations from PHO Report.
2. Provincial Health Officer, (2006). *Food, Health and Well-Being. Office of the Provincial Health Officer*. BC Ministry of Health: 103-114.
3. Splett, P. L. (1999). *Evaluating nutrition programmes*. In: Owen AL, Splett PL, Owen GM, eds. Nutrition in the Community: The Art and Science of Delivering Services. Boston, MA: McGraw-Hill, 448-476.
4. Lang, T. (2005). "*Food Control or Food Democracy? Re-engaging nutrition with society and the environment*." Public Health Nutrition 8(6 (A)): 730-737.
5. Owen, J. L., Goldberg, J. P. (1999). *Communications*. In: Owen AL, Splett PL, Owen GM, eds. Nutrition in the Community: The Art and Science of Delivering Services. Boston, MA: McGraw-Hill, 512-541.
6. Campbell, M. K, Sherman, S. G. (1999). *Nutrition Behaviour*: Implementing change in communities. In: Owen AL, Splett PL, Owen GM, eds. Nutrition in the Community: The Art and Science of Delivering Services. Boston, MA: McGraw-Hill: 172-195.

Recommended Reference Materials:

1. Community Nutritionists Council of British Columbia (2004). *Making the Connection* - Food Security and Public Health.
2. http://www.fraserhealth.ca/HealthInfo/PublicHealth/FoodAndNutrition/Food+Security.htm
3. Dieticians of Canada Community Nutritionists Council of British Columbia (2006). *The Cost of Eating in BC*. Vancouver. Available at: www.dietitians.ca (see poverty and hunger challenges BC families).
4. Instructional Skills Workshop International Advisory Committee (2006). *Instructional Skills Workshop Handbook for Participants.* UBC Teaching and Academic Growth.

Title of Course: NUT 328: Food Quality Assurance -- 45 Contact Hours

Purpose of Course:
Enables students integrate the latest principles, practices, and terminology of food safety systems with those of quality management systems.

Expected Learning Outcomes:

1. Describe Verification used of methods, procedures, or tests.
2. Determine whether the HACCP plan is operating as intended.
3. Discuss Validation as a scientific and technical process for determining critical control points and associated critical limits.
4. Describe how quality food production meets and exceed customer expectations.
5. Design an appropriate quality assurance programme enabling the food company to seek and maintain quality accreditation through process control, product evaluation and continuous quality improvement.

Course Content:
The topics to be covered in this course will include: Vocabulary of food quality assurance; introduction, definitions and explanation of terms; recognized experts in the quality field; food quality and food safety; enforcement of food laws and regulations; food standards, quality, and safety; good manufacturing practices; food safety and hazards in foods; food safety hazards and health risk; biological, chemical and physical hazards in foods; quality programmes and quality systems for the food industry; the HACCP system for food safety.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:

1. Overhead projector
2. LCD power point presentation

Course Assessment:

1. Quizzes 10%

2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Inteaz, A. (2003). *Food Quality Assurance: Principles and Practices*. CRC Press.
2. Donald, A. C. (1998). *HACCP User's Manual.* Springer Amazon publishers.
3. Andres, V. (2003). *Quality Assurance for the Food Industry: A Practical Approach.* CRC Press.

Recommended Reference Materials:

1. Bolton, A. (1997). *Quality Management Systems for the Food Industry: A Guide to ISO 9001/2.* Aspen Publishers.

Title of Course: NUT 329: Food Processing and Product Development II -- 45 Contact Hours

Purpose of Course:

The course will establish effects of food processing on the nutritional quality of foods. It will also provide an opportunity for students to develop a food product, using their training in food science and related disciplines.

Expected Learning Outcomes:

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

1. Establish effects of food processing on the nutritional quality of foods.
2. Determine the effects in of refining, heat processing, preservation, fermentation, radiation and packaging.
3. Discuss the aspects of product development.

Course Content:

The topics to be covered include: the important relationship of food processing and nutrition; the stability of nutrients and their physiological functions in foods; nutritional quality of different food resources; effect of harvesting and storage; effect of refining on the nutritional quality of foods; heat processing, freeze--preservation, moisture removal, fermentation, additives, ionizing radiation, and packaging; processing on the physiological functions of foods; advanced aspects of product development; processes and organizations; business modelling; product planning; identifying customer needs; product specifications; concept generation, selection and testing; product architecture, design for manufacturing and prototyping; robust design, intellectual property and product development economics; managing projects.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:

1. Overhead projector

2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Geankoplis, C. J. (1993). *Transport Processes and Unit Operations*. 3*rd* Edition. New Jersey: Prentice Hall, Englewood Cliffs.
2. Toledo, R. T. (1991). *Fundamentals of Food Processing Operations*. 2*nd* Edition. New York: Van Nostrand Reinhold.

Recommended Reference Materials:

1. Earle R. L. and M. D. Earle. *Unit operations in Food processing*. http://www.nzifst.org.nz/unitoperations/contents.htm

Title of Course: NUT 330: Dairy Technology -- 45 Contact Hours

Purpose of Course:

To introduce the student on the concepts of Processing and technologies of fluid milk plant operation from milk receiving to various finished products. Fluid milk, yogurt, cheese, and frozen dairy desserts; physical, microbiological, and chemical properties of fluid milk and milk components; milk quality supply; good manufacturing practices (GMPs); Hazards Critical Control Point (HACCP), and basic concepts of quality assurance and quality control.

Expected Learning Outcomes:

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

1. Discuss dairy processing unit operations and production of dairy products.
2. Integrate concepts in chemistry, biochemistry, physics, engineering, mathematics with dairy processing operations and understand their role in processing of dairy products.
3. Gain the ability to think critically about problems and issues in food processing.
4. Describe the food processing industry's role in society.

Course Content:

Introduction; Milk History, Composition, Production and Consumption, and Trends. Milk Production and Biosynthesis. Dairy Chemistry and Physics; Dairy Microbiology.

Dairy Processing Unit Operations: Clarification, Separation, Standardization, Pasteurization, UHT treatment. Homogenization, Membrane Processing, Evaporation and Dehydration, Utilities-Steam and Refrigeration.

Dairy Products Production: Overview and Fluid Milk Products, Concentrated and Dried Milk Products, Cultured Dairy Products: Cheese, yogurt, fermented beverages, Whipped Cream, Ice Cream, Butter and Whey Products.

Hygiene in Manufacturing Milk Products: Microorganisms of concern, HACCP, Pasteurization, Cleaning of Dairy Equipment and Dairy Processing Plant Sanitation.

Mode of Delivery:

1. Lecture
2. Movies
3. Field Trips

Instructional Materials:

1. Textbook
2. Power-point presentations
3. Handouts on relevant topics

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Bylund, G. (1995). *Tetra-Pak Dairy Processing Handbook*. Lund, Sweden: Tetra-Pak Processing Systems.
2. Early, R. (1998). *The Technology of Dairy Products*. London: Blackie Academic and Professional.

Recommended Reference Materials:

1. *Dairy Science and Technology.* An educational site focused on milk, dairy products, and dairy technology from the University of Guelph in Canada. http://www.foodsci.uoguelph.ca/dairyedu/home.html
2. Pieter Walstra. (1999). *Dairy Technology: Principles of Milk Properties and Processes*. Marcel Dekker Inc.

Title of Course: NUT 331: Food Chemistry -- 60 Contact Hours

Purpose of Course:

This course gives the student an understanding of the major components of foods: carbohydrates, lipids, protein, water and acids and the chemical changes of food composition which occur during the preparation of food**.** As will as the functional properties and chemical reactions of food components

Expected Learning Outcomes:

By the end of the course, students will be able to:

1. Integrate the principles of chemistry and biochemistry into real-world food science and nutritional issues.
2. 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.
3. Reproduce chemical interactions and reactions with food components; differentiate their effects on the sensory, nutritional and functional properties of foods.

4. 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.
5. Compare and contrast food processing operations on the chemical changes of food components as they relate to food quality, nutrient composition and safety.

Course Content:
The topics to be covered include: Introduction to food chemistry; water and colloids and their importance in foods; major food components with respect to classification, structure, occurrence and function; changes in food due to handling, storing, preservation and processing; minor natural food components such as enzymes, flavours, food texture, colorants, additives and leavening agents; chemistry of carbohydrates (properties, structures, and functions); food applications (sweeteners and alternative starches); modified starches; protein chemistry (composition and structure, denaturation, coagulation, functional roles); milk and milk products (components, processing, physical and chemical effects on milk products); lipids (structure, properties, chemical degradation); fats and oils in food products (chemical modifications, functional roles of fat, fat replacements).
.

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:
1. Fennema O. R. (2008). *Food Chemistry*, 4th edition (Damodaran, Parkin and Fennema editors).
2. Coultate T. P. (2002). *Food, The Chemistry of its Components*
3. James C. S. (2002). *Analytical Chemistry of Foods*
4. Societies Royal Australian Chemical Institute http://www.raci.org.au/
5. Students of Chemistry Society (UNSW), http://www.chem.unsw.edu.au/schoolinfo/socs.html
6. Skoog, D. A,. Holler, F. J. and Crouch S. R. (2007). *Principles of Instrumental Analysis* by 6th Edition.

Recommended Reference Materials:
1. John M. D. (2004). *Principles of Food Chemistry*.
2. Belitz, H. D., Grosch, W. and Schieberle, P. (2001). *Food Chemistry*, Third Edition

3. McWilliams, M. (2004). *Foods Experimental Perspectives*, 5th Edition, Prentice Hall Inc., Toronto.

Title of Course: NUT 332: Food Economics and Policy -- 45 Contact Hours

Purpose of Course:
This course introduces students to policy issues arising from the operation of food and agricultural markets as well as to some analytical tools which can be used to study these issues.

Expected Learning Outcomes:
By the end of the course, students will be able to:

1. Discuss Food and agricultural markets as an excellent laboratory application of microeconomic principles because of the prevalence of market failures and government intervention.
2. Describe the rationale for public intervention in agricultural and food markets.
3. Explores the functioning of the EU's Common Agricultural Policy, examines the consequences of price and income support both for the domestic economy and for world food markets.
4. Evaluate the attempts to regulate agricultural policy interventions through rule-making by the World Trade Organisation.
5. Discuss regulating agriculture's impact on the environment, the economics of bio fuels, rural development, market power in food markets, and the economics of food safety.
6. Describe European economics, public policy analysis, and international trade or development issues.

Course Content:
The topics in this course will include: Motivation and context: Agricultural and food markets, an introduction the global food situation. Agricultural policy objectives: The farm problem; the truth about farm incomes; Multifunctional: a new rationale for support, Measurement of agricultural supported agricultural policy: The cap: origins and institutions; Cap reform: from MacSharry through agenda 2000 and to the mid-term review, the Luxembourg agreement 2003: decoupling and the cap health check and EU budget review: further reform? The economics of price support policies: Price policy analysis: closed economy; Price policy analysis: open economy; Transfer efficiency of price support and the cost of the cap.

Rural development and bio fuels policies: Cap pillar 2 policies: from structural policy to rural development; Critique of rural development interventions; Bio fuels policies and the economics of bio fuels.

Managing agriculture's impact on the environment: Integrating environment concerns into agricultural policy; regulating negative impacts on the environment; Agriculture and public goods provision and Irish agric-environment policies. Regulating agricultural trade: Impact of agricultural support on world market prices; The Uruguay round agreement on agriculture; Doha round negotiations on agriculture – the issues and Doha round negotiations on agriculture – the positions.

Impacts of agricultural trade liberalisation: Measuring trade liberalisation effect; Impact of a Doha agreement on the cap and Ireland; Developing countries and WTO agricultural negotiations and Impact of agricultural protectionism and trade liberalisation on developing countries. Market power in the food chain: Structural changes in the food chain – the evidence; measuring market power; controlling market power in the food industry and the groceries order. Food law and food safety: food safety – an introduction; the economics of food safety; international trade and food standards and case studies: beef hormones and GMOS.

Mode of Delivery:

1. lectures
2. group discussions
3. experiential learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Ackrill, R. (2000). *The Common Agricultural Policy*. Continuum International Publishing Group - Sheffield.
2. Andresso-O'Callaghan, B. (2003). *The Economics of European Agriculture*. Basingstoke: Palgrave Macmillan.
3. Blandford, D., and Hill, B (2006). *Policy Reform and Adjustment in the Agricultural Sectors of Developed Countries*. CABI Publishing.
4. Cardwell, M. (2004). *The European Model of Agriculture. Oxford*: Oxford University Press.
5. Coleman, W., Wynn, G. and Tim, J. (2004). *Agriculture in the New Global Economy*. Edward Elgar Publishing Ltd.
6. Fennell, R. (1997). The *Common Agricultural Policy: Continuity and Change.* Clarendon Press.
7. Garzon, I. (2006). *Reforming the Common Agricultural Policy: History of a Paradigm Change.* Palgrave Macmillan.
8. Grant, W. (1997). *The Common Agricultural Policy*. Palgrave Macmillan.

Recommended Reference Materials:

1. Hennis, M. (2004). *Globalization and European Integration: The Changing Role of Farmers in the Common Agricultural Policy.* Rowman & Littlefield Publishers.
2. Ingersent, K. A. (1999). *Agricultural Policy in Western Europe and the United States*. Cheltenham: Edward Elgar.
3. Ingersent, K. A., Rayner, A. J. and Hine, R. C. (1997). *The Reform of the Common Agricultural Policy*. Palgrave Macmillan.
4. Kay, A. (1998). *Reform of the Common Agricultural Policy*: The Case of the MacSharry Reforms. CABI Publishing.

5. Moyer, H. W. and Tim, J. (2002). *Agricultural Policy Reform*: Politics and Process in the EU and US in the 1990s. Ashgate.
6. Piccinini, A. and Margaret, L. (2001). *Agricultural Policies in Europe:* Farmers between Subsidies and the Market. Palgrave Macmillan.
7. Tracy, Ml. (1989). *Government and Agriculture in Western Europe 1880-1988*. New York: Harvester Wheatsheaf.
8. USDA. (1999). *The European Union's Common Agricultural Policy:* Pressures for Change. http://www.ers.usda.gov/publications/Wrs992/wrs992.pdf.

Title of Course: NUT 333: Food Marketing- 45 Contact Hours

Purpose of Course:
To introduce students to the essentials of marketing (key concepts, methods of analysis, strategies and tactics) critical to managing profitable customer relationships in today's dynamic and connected environment.

Expected Learning Outcomes:
By the end of the course, students will be able to:
1. Describe marketing strategy and the elements of marketing analysis: customer analysis, company analysis and competitor analysis.
2. Discuss the elements of the marketing mix (product, pricing, promotion, and distribution strategies).
3. Discuss problem solving and decision making abilities by learning how to leverage strategic marketing analysis to inform tactical marketing mix decisions while providing comprehensive framework to evaluate marketing decisions and to create successful marketing initiatives.
4. Demonstrate knowledge of marketing industry while increasing students awareness of strategic and tactical decisions behind today's top performing brands.

Course Content:
The topics to be covered include: Introduction to food marketing: Marketing Process and Company Analysis

Team Project: Create a marketing plan, description of the existing situation including target market (highlighting key customer learning's), company objectives and existing competitors in the marketplace. Identify the customers for the specific product or service and describe these consumers in relevant ways (demographics, lifestyles, knowledge of product). Explain why the new product/service would be appropriate for your target market. Market research (one-on-one interviewing of a small group of potential users of the product of service and/or a survey of a larger sample of potential users).

Outline a marketing strategy for the new product/service. Discussing a description of the product/service and its benefits, pricing and

positioning strategy, advertising and promotional plans, and a consideration of distribution channel(s).

Competitor Analysis: Individual and Aggregate. Project Descriptions: Applying the concepts and methods of marketing to a real-world marketing opportunity. Creating a comprehensive marketing plan for a new product or service of choice. It will involve the following: choosing a "new" product or service in an ***existing*** product/service category. Customer Analysis: Segmentation, Targeting and Positioning, Product, Services and Branding Strategies. Pricing, Integrated Marketing Communication and Channels of Distribution

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:

1. Philip K., Gary, A. and Peggy, Cunningham. *Principles of Marketing*, 6th Canadian Edition, Prentice Hall.
2. Institute of Medicine of the National Academies (2005). *Guidelines for Responsible Food Marketing to Children.* Washington, D.C. 20009.
3. Padberg, D I., Ritson, C. and Albisu, L. M. (2001). *Agro-Food Marketing*. Pretoria, South Africa.

Recommended Reference Materials:

1. Tichi, C. (2004). "*From the Jungle to Fast Food Nation: American Déjà Vu"*. *Exposés and excess: muckraking in America, 1900-2000*. University of Pennsylvania Press.
2. Schlosser, E. (2001). "*Fast Food Nation*." New York: Houghton Mifflin Co.

Title of Course: NUT 334: Agricultural Biotechnology -- 45 Contact Hours

Purpose of Course:

The Purpose of Course of the course is to equip the students with skills on biotechnology focussing on agriculture.

Expected Learning Outcomes:
By the end of the course, the students will be able to:

1. Describe the scientific principles and techniques of biotechnology.
2. Design biotechnological products.
3. Explain the implementation of the use of biotechnological products in community settings.

Course Content:
The course topics will include: Introduction to biotechnology (Genetic Counselling ,Concept of gene, Patterns of inheritance, Relating genes to DNA, Structure of DNA, Mutations, DNA replication, Human genetic diseases (patterns of inheritance)), Methods of DNA analysis (Technology: Restriction enzymes, RFLP's, PCR, Applications - Forensics applications, Simulation - DNA fingerprinting), Pharmaceutical Products (From DNA to protein, Transcription, Translation, Foundations of DNA technology , Tools of genetic engineering, Recombinant DNA experiments ,Methods of DNA technology ,Tools of genetic engineering, Recombinant DNA experiments, DNA transformation simulation, Products/Applications (Drugs,Vaccines, Antisense products), Agriculture and Food Products (Animal health products , Vaccines, Diagnostic techniques, Transgenic Plants: DNA insertion methods ,Herbicide resistant plants, Disease resistant plants, ELSI, Transgenic Animals: Putting DNA in mammalian cells, Animal bioreactors, Replacement parts for humans, Animal models for human diseases, ELSI, Gene therapy: Technology, Potential uses, Germ cell vs. somatic cell therapy.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:

1. A term paper (30 marks)
2. A seminar presentation on key concepts and their application in local contexts (10 marks)
3. An end of semester written University Examination (60 marks)

Core Reading Materials for the Course:

1. Youdeowei A., Ezediuma, F.O.C. and Onazi, C.A (1988). *Introduction to Tropical Agriculture,* Longman Group Ltd.
2. Webster, C.C. and Wilson, P.N. (1966). *Agriculture in the Tropics*, Longman Green and Co.
3. Williamson, G. and Payne, W.J.A. (1965). *An Introduction to Animal Husbandry in the Tropics*, 2nd Edition, English Language book Society and Longman Group Limited, London.
4. Ngugi, J. B. M., (1995). *Chicken Production*. Kenya Literature Bureau.

Recommended Reference Materials:

1. Information, Research and Communication Centre (IRACC) and Marketing Support Services, (1997). *Small Holder farming Handbook for Self Employment.* Print Displays, Nairobi.
2. PAL, (1986). *Livestock and Cattle Productivity, Nutrition and Disease in Northern Kenya*: Technical Report E-8/UNESCO-Nairobi.
3. Mayhew, S. and Penny, A. (1988). *Tropical and Scientific Foods*. Macmillan Education Ltd.
4. IIRR (1998). *Sustainable Agriculture Extension Manual for Eastern and Southern Africa.* IIRR, Nairobi.

Title of Course: NUT 335: World Food Problems and Food Security -- 45 Contact Hours

Purpose of Course:
The purpose of the course is to enable the learner understand the prevailing world food problems and challenges in food security.

Expected Learning Outcomes:
By the end of the course, the students should be able to:
1. Describe and apply the use of economic concepts to analyze global food problems.
2. Explain the world food problems and their relationship to agricultural production, development, and policies.
3. Demonstrate basic food policy analysis skills.

Course Content:
The topics to be covered include: Food is the universal commodity and our most direct link to the natural environment. Today this link is increasingly mediated by multi-national corporations, which control much of the production process from the patenting of seeds to the transcontinental shipment of agricultural commodities to the delivery of ready-to-eat products to our tables. This course explores how the spatial organization of the global food system is critical to our understanding of the development of the world economy. Ranging in scale from the level of the individual to national and global levels, the course will examine issues of food security, trade, and environmental sustainability. We will trace the historical development of food production and distribution on a global scale, marking important developments such as the petrochemical revolution, the Green Revolution, genetic modification, and fast food marketing. This course provides a multi-disciplinary look at problems (and some of the possible solutions) affecting food production, storage, and utilization. Presentations and discussions cover sometimes conflicting views on population control, use of technology, as well as the ethical and cultural values of the people in various countries of the world. Emphasis is placed on the need for governments, international assistance agencies, international research and extension centres, as well as the private business sector to assist in solving these complex problems.

The course topics will include: The World Food System: Introduction and Overview **,** Historical Development of the World Food System: The Case of Sugar, Geography and the International Relations of Food, Hunger and Malnutrition at Various Scales of Analysis, Alternative Agricultural Solutions, Resources for a Hungry World: What are they? Who uses them? Where are they? Production Practices and Challenges, Food Distribution and Security Issues, Introduction to Potential Solutions & Implementation Problems, Globalization or Economic Integration, Role of Institutions in alleviating world

food problems**,** Role of Science and Technology in Addressing World Hunger, Biotechnology and the Green Revolution.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Material:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:

1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:

1. Vaclav Smil, *Feeding the World: A Challenge for the 21st Century.*
2. Geoff Tansey and Tony Worsley, *The Food System: A Guide, chapter 2,* "Food and the Biosphere," chapter 3 "Modern Food: Where Did it Come From?"
3. Mintz, Sidney. (1985). *Sweetness and Power: The Place of Sugar in Modern History.* New York: Viking Penguin.
4. Nestle, M. (2003). *Safe Food: Bacteria, Biotechnology, and Bioterrorism*. Berkeley: University of California Press.
5. Norberg-Hodge, H., Merrifield, T., and Gorelick, S. (2002). *Bringing the Food Economy Home*. London: Zed Books.
6. Schlosser, Eric. (2001). *Fast Food Nation: The Dark Side of the All-American Meal.* Harper Collins.
7. Young, E. M. (1997). *World Hunger*. London: Routledge.

Recommended Reference Materials:

1. *Ending Hunger in Our Lifetime: Food Security and Globalization.* (2003). Available at McGrath Library, www.amazon.com and www.barnesandnoble.com
2. World Development Report (2008). *Agriculture for Development by World Bank.* Oct. 2007.
3. http://www.worldbank.org/wdr2008

Title of Course: NUT 336: Scientific Analysis and Presentation of Aquaculture -- 45 Contact Hours

Purpose of Course:
The course aims at equipping the students with skills on scientific analysis and aquaculture.

Expected Learning Outcomes:
By the end of the course, the students should be able to:

1. Describe the process of conducting research related to aquaculture.
2. Analyze data and critically evaluate the findings.

3. Develop a research manuscript.

Course Content:
This is a course which provides an intensive learning opportunity through the undertaking of an applied research project related to the aquaculture industry. Completion of a literature review and research project will form the basis for a final report and oral presentation to be made to a 'Special Project Committee'. The special project will provide hands-on research experience with live animals, either in a laboratory or commercial setting. The tasks in this course will include: Select an area of interest, Presentation of the project, Development of a timeline, methodology and resource requirements for the project, Submit a written project proposal which includes: a brief literature review; statement of project objectives; a working hypothesis or question to be resolved; a summary of the suggested methods to test the hypothesis (with method of data collection and analysis included); a time-line for project completion, Carry out the planned project: Prepare a final report on the completed project and deliver a maximum 30 minute oral presentation and complete an oral examination.

Mode of Delivery:
1. Group discussions
2. Case studies
3. Individual and work-based assignment

Instructional Materials:
1. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.
2. Community partnership sites

Course Assessment:
The students are assessed through:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:
1. SPSS Training Manuals, 2000 edition.
2. STATA Training manuals, 2000 edition.
3. Other tutorial notes on SPSS and STATA (available in research libraries e.g. KESREF, KARI).
4. Frederick S. Hillier, (2004). *Introduction to Operations Research*. Sage Publications.
5. Gworgwor, N. A. (1989). *On-Farm Adaptive Research*: Researcher-Farmer Experience in Northern Nigeria. Nigeria.
6. Mike Walton (1997). *Research Methods*. Study Guide 1 – 6. University of Lincolustufie and Humberside.

Recommended Reference Materials:
1. Ndiweni, M., B. Mac Garry, A. Chaguma and D. Gumbo (1989). *Involving Farmers in Rural Technical Technologies: Case Studies of Zimbabwean NGO's. Network.* Paper 25, Agricultural Administration (Research and Extension).

2. Thornley, K. (1990). *Involving Farmers in Agriculture Research: A Farmer's Perspective.* American Journal of Alternative Agriculture, 25: 35-48.
3. Zaffaroni, E. and Barros, H.A. (1989). *Operational Approaches in Participatory Technology Development for Small Farmers in Northeast Brazil*. Brazil.

Title of Course: NUT 437: Food Law -- 45 Contact Hours

Purpose of Course:
To enable students apply principles of food law to food industry. Emphasize the practical importance of food law to the food professional. Discuss with reference to the role of politics, societal issues, logic, ethics, statistics and scientific principles.

Expected Learning Outcomes:
At the end of the course, the student will be able to:
1. Apply regulations that contribute to a safe, nutritious, and wholesome food supply. Describe how technological, social and political forces interact in the development of food law and regulation.
2. Discuss the law and legal system: in Kenya, the EU, and the US.
3. Enumerate the differences and similarities between international and domestic food law and regulation.
4. Discuss global perspectives on the challenges and opportunities in the international food trade, including the steps being taken towards international harmonization, key international players and potential outcomes.
5. Be aware of food law issues as they appear on reliable Internet sources and to be able to discuss them.
6. Have access to the most recent changes in food law.
7. critique domestic and international regulatory issues and their impact on food laws as illustrated by case studies.

Course Content:
Introduction to food law and safety, general principles of food: risk analysis, Precautionary principle, Consumer protection, Transparency, Presentation, and Responsibilities such as Traceability and Trade obligations. Rapid alert system and emergency measures for food and feed.

Factors affecting food law developments: Overview of how technological, social, economic and political forces interact in the development of food law and regulation.
Law and legal system: in Kenya -Case studies from court reports, Adulteration case studies from court reports. Overview of the laws, regulations, history and policies that govern food regulation in the Kenya.

The guiding principles of food regulations: focusing on global economy and International food trade.

Problem solving and discussion related to definitions and food standards, product labelling and misbranding, food additives and food colouring.

Mode of Delivery:

1. Lecture
2. Handouts
3. Homework exercises
4. Student Presentations

Instructional Materials:
1. PowerPoint presentations
2. Overhead transparencies
3. Handouts

Core Reading Materials for the Course:
1. Coduto, J.A., *Global Perspectives on Law and Ethics*, McGraw Hill Publishers.
2. Stella McDermott (2006). *The Divine Food Law*. Kissinger Publishing.
3. Alain Gerard (1983). *An Outline of Food Law: Structure, Principles, Main Provisions.* Food and Agricultural Organization (FAO).

Recommended Reference Materials:
1. 2nd International Food Regulatory Summit, (2008) "*Delivering Consumer Choice, Health and Safety"*16-17 October 2008: The Grand Vasant Kunj, New Delhi. The Guiding Principles of Food Regulations.
2. Kaarin Goodburn (2001). *EU Food Law: A Practical Guide.* CRC press.

Title of Course: NUT 338: Food Engineering -- 60 Contact Hours

Purpose of Course:
In this course, students will study the principles and measurement of various physical properties of foods that measure the overall quality of fresh and prepared foods. These are properties that are important in handling, preparing, processing, preserving, packaging, storing, and distribution of foods, also the principles and limitations of instrumental methods that are currently used to determine physical properties of foods.

Expected Learning Outcomes:
At the end of the course, the student will be able to:
1. Describe the student with basic engineering principles and mathematical methods applicable to a wide range of food engineering and food processes situations.
2. Discuss advanced food processing and preservation courses.
3. Illustrate the uses of engineering concepts in industrial food processing applications.
4. Apply the fundamentals and applications of rheological properties, behaviour, and fluid transportation in food processing systems.
5. Discuss the controlling factors of the process in order to suggest new or improved techniques in process design and development.

Course Content:
Basic principles of food process engineering – mass and energy. Food composition, physical properties. Introduction to food processing. Units and dimensions. SI, CGS, English systems. Conversion factors. Dimensional consistency. Problems - solving examples.

Material balances. Batch and continuous processes. General mass balance equations, algebraic unknowns, tie substance, basics for calculation. Thermodynamics. Thermodynamic properties. Vapours and gases. Ideal gas law. Real gases. Sensible and latent heat. Enthalpy. Energy balances.

Fluid mechanics. Viscosity. Laminar and turbulent flow. Fluid flow in pipes, pressure drop, friction. Reynolds number. Bernoulli equation.

Heat transfer theory. Conduction, convection, radiation. Fourier's law. Heat transfer applications. Steady state. Forced and free convection equations.
Dimensionless numbers. Heat exchangers. Heat transfer coefficients. Problems – solving examples.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Toledo, R. T. (1991). *Fundamentals of Food Processing Operations*. 2nd Edition. Van Nostrand Reinhold, New York, NY. [TP 371 T649 1991].
2. Singh, R. P., and D. R. Heldman. 2nd Edition. (1993). *Introduction to Food Engineering.* San Diego, CA: Academic Press.
3. Brennan, J.G. (1990). *Food Engineering Operations*. Elsevier Applied Science, London, New York.

Recommended Reference Materials:

1. Earle R.L. and M.D. Earle, *Unit operations in Food processing.* http://www.nzifst.org.nz/unitoperations/contents.htm
2. Geankoplis, C.J. (1993). *Transport Processes and Unit Operations*. 3rd Edition. Prentice Hall, Englewood Cliffs, NJ.

Title of Course: NUT 339: Introduction to Unit Operations -- 45 Contact Hours

Purpose of Course

The principles introduced in this course are used in studying some of the more important unit operations in the food industry. The procedure used for each unit operation is to firstly describe the process, its applications, effects on the food product and requirements,

appropriate process diagrams, mass and heat balances and flows, solving unit operation problems. Unit operations covered are refrigeration, dehydration, evaporation, extrusion, physical separation and comminution

Expected Learning Outcomes:
At the end of the course, the student will be able to:
1. Describe basic unit processes and unit operations
2. Learn about distillation principles
3. To utilize distillation theory and apply it directly to real and practical problems.
4. Critical design aspects and analysis of various types of Distillation, column types and internals.
5. Troubleshoot distillation processes.
6. Learn about the instrumentation and control commonly deployed with the equipment
7. Develop the understanding of distillation problems including thermodynamics and VLE, process design and hardware consideration.
8. Describe the attendees guidelines for the selection of hardware

Course Content:
Introduction to process and equipment engineering Unit Processes & Unit Operations. Phase Equilibria, Ideal and non-ideal systems. Azeotropes Various types of distillation operations: Rectification, significance and role of reflux, Reflux, minimum, optimum, Reboiler and Condenser heat loads, Stage Concepts, Number of theoretical and actual stages. Overall tray efficiency, Multi component systems.

Extractive distillation: Crude Distillation Unit (ADU / CDU),Vacuum Distillation Unit [VDU], Azeotropic distillation, Tray / Plate columns, bubble cap, sieve, valve, weir, down comer,
Flow patterns, pressure drop, plate stability, Packed Columns, packing's – random, regular, structured, packing, Supports, liquid distributors, other accessories, Column (Tower) sizing, general outline. Column Operation: significant operating parameters, Height of liquid on plate, vapour phase pressure drop.

Poor efficiency of contact (weeping, flooding), remedial measures, Typical Capacity graphs for bubble cap and sieve trays, Vacuum devices and tower vacuum, Operating objectives and control strategies, Distillation column control configurations

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test

4. Final Examination

Core Reading Materials for the Course:

1. Benitez, J. (2002). *Principles and Modern Applications of Mass Transfer Operations*, New York: Wiley-Interscience.
2. McCabe, W. L., Smith, J. C and Harriett, P. (2001). *Unit Operations of Chemical Engineering*, 6th edition, New York: McGraw-Hill, Inc.
3. Treybal, R. E (1981). *Mass Transfer Operations*, 3rd edition, New York: McGraw-Hill, Inc.

Recommended Reference Materials:

1. Geankoplis, C. J. (2003). *Transport Processes and Separation Principles*: Includes Unit Operations, 4th Edition, New Jersey: Prentice-Hall Inc.
2. Cussler, E. L. (2003). *Diffusion: Mass Transfer in Fluid Systems*, 2nd edition, Cambridge University Press.

Title of Course: NUT 340: Food Safety -- 45 Contact Hours

Purpose of Course:

This course is designed to provide students food safety knowledge and skills required to successfully oversee the food safety operations of food service.

Expected Learning Outcomes:

On completion of this unit students should be able to:

1. Demonstrate knowledge sufficient to identify food safety hazards and to take preventative measures.
2. Identify responsibilities of food handlers in a school food service facility.
3. Demonstrate knowledge sufficient to ensure safe and hygienic practice in a food service facility.
4. Demonstrate correct use of equipment used to ensure food is prepared safely and suitable for human consumption.
5. Demonstrate ability to implement a food safety programme in a food service facility.

Course Content:

The roles of microorganisms in the food industry, positive and negative. Types of microorganisms in foods (yeast, bacteria, molds, viruses) and their possible roles (fermentation, bioreactors, disease, spoilage). Basic bacterial characteristics: Gram negative/Gram positive, morphology.

Microbial growth in foods: intrinsic parameters. Microbial growth in food: extrinsic parameters and means of control (food formulations, cooking, preservatives, Hurdle Concept). Food-borne disease: infections, poisoning, toxico-infections. Sources and transmission of bacteria in foods: human, animal, and environmental reservoirs; cross-contamination; food associations.

Pathogens-Infections: Salmonella, Listeria, Campylobacter, E. coli O157:H7. Pathogens-Sporeformers, Viruses, and Intoxications: NLV, HAV, S. aureus, C. botulinum. Microbial detection and indicator organisms: approach and techniques; pathogen indicators. Government Agency and Food Safety Policy: Government Branches (FDA, CDC, USDA

and how they work to control food safety), HACCP, Risk Assessment. New pathogens and emerging food-borne diseases. Current Food Safety Topic: antibiotic resistance.

Mode of Delivery:
1. lectures
2. group discussions
3. case studies
4. work-based assignment

Instructional Materials:
1. overhead projector
2. LCD power-point presentation

Course Assessment:
1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:
1. Cynthia A. R. *The Food Safety Information Handbook.*
2. Keith T. A. *Genetically Modified Crops: Assessing Safety*.
3. Thomas R. D. *Bountiful Harvest: Technology, Food Safety, and the Environment*.

Recommended Reference Materials:
1. Wayne, J., Jean-Christophe, B. and Stephan, M. *Food Safety: Protection or protectionism?* In OECD Observer.
2. Ardith, M. and Eric, P. *Scientific Information, Elite Attitudes, and the Public Debate over Food Safety, in Policy Studies Journal*.
3. Barbara A. A. and Melissa S. N. *Food Safety Certification Regulations in the United States, in Journal of Environmental Health*. 5 pgs.
4. Grace S. *Internationalization, Democracy, and Food Safety Measures: The (Il) Legitimacy of Consumer Preferences?, in Global Governance* .24 pgs.

Title of Course: NUT 341: Physical Properties of Food -- 45 Contact Hours

Purpose of Course:
The students will study the chemical and physical properties of foods and the principles of food selection, storage, preparation and evaluation. The preservation of nutrients, colour, texture, and flavour will be applied through food laboratory work and demonstrations. The students will develop the ability to recognize and produce safe quality food items.

Expected Learning Outcomes:
Upon completion of this course, students should/will:
1. Understand how physical and chemical properties of food are affected by food preparation and production.

2. Understand and apply safe food handling techniques and know their application in various food production systems.
3. Interpret recipe terminology correctly.
4. Demonstrate basic food preparation techniques with respect to preservation of nutrients, colour, texture, and flavour of foods.
5. Have an awareness of product standards as they are applied to the evaluation of foods and used in quality control food production.
6. Evaluate food products against quality standards.
7. Understand rational for dress/ work codes and follow these codes.

Course Content:
Heat - sources of heat, the use of heat in food preparation, changes in food caused by heat.

Vegetables, salad greens and herbs - classifications, changes that occur in texture, colour, flavour and nutrients when preparation techniques are applied. Salads & Salad Dressings - what ingredients are used, emulsions, how dressings are used, classification of salads. Fruits - composition, changes during ripening, enzymatic browning, the effects of adding sugar, cooking and/or freezing fruits, dried fruits, canned fruits.

Food Fats - sources, hydrogenation, uses in food preparation. Starches - types of starches used in food preparation, the effects of heat, acids, sugar and stirring has on starches, use of dry heat (dextrinization), use of moist heat (gelatinization), prevention of lumping, weeping, skin formation, sauces. Cereals - classification of cereals, ratio of water to different types of cereal, preparation techniques. Rice & Pasta - origin, varieties, cooking and serving techniques.

Eggs - structure, composition, changes as the egg ages, grading, storage, use of eggs as thickening agents, gelling agents, structural ingredients, leavening agent, source of liquid, coagulation, factors affecting egg white foams. Milk and Dairy Products - composition, processing milk, storage, effects of heat, acid and enzymes on milk. Cheese - classification, cooking with moist and dry heat.

Meat - beef, pork, veal and lamb, composition, structure, grading, effects of dry and moist heat, variety meats, stocks. Poultry - composition, grading, storing, cooking with dry and moist heat, stocks. Fish and Seafood - composition, market form, buying tips, principles of cooking fish and seafood, stocks.

Flour products - function of each ingredient, biscuit/ pastry, muffin and cake methods, yeast dough. Vegetable Proteins - composition, methods of re-hydration, effect of cooking and acids.

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:

1. Labensky, H. M., Bevan, S. (2009). *On Cooking. Canadian Edition*, 4th Edition Prentice Hall.
2. Lab Manual, (2009). *Forbes, Food Preparation and Theory.*
3. Sahin, S. and Sumnu, S. G. (2006). *Physical Properties of Foods.*

Recommended Reference Materials:

1. Lewis, M. J. (1990). *Physical Properties of Foods and Food Processing Systems*. University of Reading, UK.
2. Taylor and Francis, (2005). *Food Carbohydrates: Chemistry, Physical Properties, and Applications.*
3. Santipanichwong, R., Suphantharika, M., J Weiss, J and McClements, D. J. (2008). *Core-Shell Biopolymer Nanoparticles.* Electrostatic. Journal of Food Science.
4. David, J. M., Eric, A. D., Yeonhwa, P. and Jochen, W. (2008). *Designing Food Structure to Control Stability, Digestion, and Release: Food Biophysics*.
5. Ludger O. F. and Arthur A. T. (2007). *Food Physics: Physical Properties - Measurement and Applications*.

Title of Course: NUT 411: Maternal and Child Health -- 45 Contact Hours

Purpose of Course:

The course Purpose of Course is to facilitate the development of knowledge and skills related to the review, assessment, in the field of maternal and child health targeting the care, especially preventive and health promotion care, related to children and women of childbearing age.

Expected Learning Outcomes:

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

1. Explain the nursing process (assessment, diagnosing, planning, implementing and evaluating) as the foundation for maternal- child nursing.
2. Prioritize the self-care needs of maternal and child clients using Maslow's hierarchy of needs.
3. Apply principles of therapeutic communication with maternal- child clients, co-worker and instructors.
4. Identify health care information needs of maternal and child clients utilizing the nursing process.
5. Responsibly manage nursing care for the maternal-child client using available resources.
6. Practice nursing for the maternal and child client with in an ethical and legal framework and is accountable for those nursing practices.

Course Content:

The topics to be covered will include: methods of determining the nursing actions needed to meet the universal, development and therapeutic self-care needs of child bearing families; the normal processes of childbearing and child development; common child health problems; related pharmacology; skill attainment through clinical laboratory experience with maternal and child patients.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:

1. Abram, A., Pennington, S., and Laammon, C. X. (2009). *Clinical Drug Therapy*. Philadelphia, P. A: Lippincott, Williams and Wilkins,
2. Morris, D. (2010). *Calculate with Confidence*. St. Louis , Missouri: Mosby
3. Perry, A. and Potter. P. (2010). *Clinical Nursing Skills.* St. Louis , Missouri: Mosby
4. Ricci, S and Kyle, T. (2009). *Maternity and Paediatrics Nursing.* Philadelphia, P. A: Lippincott, Williams and Wilkins,
5. http:/the point.lww.com/Ricci-Kyle
1. *STD Case Management: The Syndrome Approach for Primary Health Care Settings.* Participant's Version (1997). WHO Regional Office for the W. Pacific. Manila 1997. (Available at: http://www.wpro.who.int/NR/rdonlyres/73F8E5F9BFEA4895AAF83079AD4F104F/0/ParticipantsVersion.pdf ; http://www.wpro.who.int/NR/rdonlyres/2E4A65677F1F484F8C5DA1DE3AF4C050/0/FacilitatorsVersion.pdf)

Recommended Reference Materials:

2. *WHO Antenatal Care Randomized Trial: Manual for the Implementation of the New Model.* UNDP/UNFPA/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction. Dept of Reproductive Health and Research,
3. World Health Organization, Geneva, (2002). *Family and Community Health*, (Available at http://whqlibdoc.who.int/hq/2001/WHO_RHR_01.30.pdf)
4. African Medical and Research Foundation, Nairobi, Kenya, (1997). *Community Health* 2nd edition. Wood, CH.

Title of Course: NUT 412: Nutritional Epidemiology -- 45 Contact Hours

Purpose of Course:
The overall objective of this course is to provide you with an understanding of the theoretical and practical considerations in the conduct of epidemiologic studies related to nutrition. More specifically, the course focuses on the conduct of epidemiologic studies of diet, nutrition, and chronic disease.

Expected Learning Outcomes:
By the conclusion of this course students will be able to:

1. Select the most appropriate dietary intake assessment method for a given research question, epidemiologic study design, and study population.
2. Identify the strengths and limitations of each dietary intake assessment methodology currently available, and understand the implications of the limitations of each method on study results.
3. Describe the various methods available for assessing physical activity in epidemiologic studies, and identify the major strengths and limitations of each method.
4. Select the most appropriate epidemiologic study designs for various nutrition-related research questions by taking into account the strengths and limitations of various designs in relation to specific nutrition research questions.
5. Describe the data analysis and interpretation issues of special importance in nutritional epidemiology studies.

Course Content:
General design considerations; Nature of variation in diet; Exposure assessment I: Recalls, Records; Exposure assessment II: FFQs and Exposure assessment III: Biomarkers; Physical activity assessment.

Data analysis & interpretation issues; Cross sectional, ecologic and migrant studies; Case control studies; Cohort studies; Controlled trials and behavioural intervention studies; Special topics I: Food group analysis; Dietary supplements and nutraceutical and Special topics II: Influence of special interests in nutrition research.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Experiential learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Walter, W. (1998). *Nutritional Epidemiology*, Second Edition. Oxford University Press, 1998.
2. Jahns, L., Carriquiry, A., Arab, L., Mroz, T. A., Popkin, B. M. (2004) .*Within- and Between Person Variation in Nutrient Intakes of Russian and U.S. Children Differs by Sex and Age.* Journal of Nutrition. 134; 3114-3120.
3. Johnson, R. K., Soultanakis, R. P., Matthews, D.E. (1998). *Literacy and Body Fatness are Associated with Underreporting of Energy Intake in US Low-Income Women Using the Multiple-Pass 24-Hour Recall: a Doubly Labelled Water Study*. Journal of the American Dietetic Association. 98: 1136-1140.
4. Kristal, A. R, Peters, U., Potter, J. D. (2005). *Is It Time to Abandon the Food Frequency Questionnaire? Cancer Epidemiology Biomarkers and Prevention*. 14(12): 2826-2828.

Recommended Reference Materials:

1. Keim, N.L., Blanton, C.A., Kretsch, M. J. (2004). *America's Obesity Epidemic: Measuring Physical Activity to Promote and Active Lifestyle*. Journal of the American Dietetic Association. 104: 1398-1409.
2. Ward D. S., Evenson, K. R, Vaughn. A., Brown, R. A., Troiano, R.P. (2005) *Accelerometer Use in Physical Activity: Best Practices and Research Recommendations*. 37(11): S582-S588.
3. Simon, J.A. et al. (2003). *Relation of Serum Ascorbic Acid to Helicobacter Pylori Serology in US adults: the Third National Health and Nutrition Examination Survey*. Journal of the American College of Nutrition. 22(4): 283-289. Missouri Diet Manual. Page 3.1-3.3. http://www.dhss.mo.gov/DietManual/

Title of Course: NUT 413: Food Hygiene and Environmental Health II -- 45 Contact Hours

Purpose of Courses:
To enable students relate aspects of food hygiene and safety to those of environment.

Expected Learning Outcomes:
Students who have completed this course should have acquired:

1. Detailed knowledge of scientific principles underpinning the conversion of raw agricultural products into safe, nutritious and interesting food.
2. An ability to discuss food production from different perspectives, including: the regulatory environment governing the supply of safe and high quality food; international trade; agricultural production and supply chain management; biotechnological innovation and food production.
3. To employ environmental issues relevant to food production and the technology needed to address these issues across the production chain.

Course Content:
Fundamental aspects of food hygiene, sanitation technology, water and environmental microbiology, water treatment microbiology and epidemiology of food and waterborne pathogens will be taught. Current issues in public health in relation to the safety of our water and food supply will also be covered. Total food supply chain & environmental impact: How each area of the supply chain can potentially affect the environment and Methods of minimizing negative environmental impact.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Experiential Learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Practical 10%
2. CAT 20%
3. Final examination 70%

Core Reading Materials for the Course:

1. Robert H. Friis. (2007). *Essential Of Environmental Health*. Jones and Bartlett Publishers.
2. David Ball. (2006). *Environmental Health Policy*. Open University Press.
3. Rick, P. (2003,). *Introduction to Food Science*, Thomson Delmar Learning.
4. Janet, D. W. (2002). *Principles of Food Science*, Goodheart/Willcox.
5. Brown, A. *Understanding Food, Principles and Preparation*.

Recommended Reference Materials:

1. Food Science, the National Council of Agricultural Education
2. Jackson, M. H. (1989). *Environmental Health Reference Book*. Marcel Dekker
3. Lee, Frank. *Basic Food Chemistry*.
4. Banwart, George. *Basic Food Microbiology*.

Title of Course: NUT 414: Seminar and Special Topics -- 45 Contact Hours

Purpose of Courses:

To orientate student to reports and discussions of current topics in food science and nutrition, as well as oral reports of thesis and dissertation research topics in progress.

Expected Learning Outcomes:

1. To analyze the features and rhetorical devices used in different types of non-fiction: essays, speeches, editorials, scientific reports and historical documents.
2. To develop their ability to relate prior knowledge to new information and make connections to related topics of information.
3. To demonstrate an ability to articulate a clear thesis on a topic, and identify, evaluate and use evidence to support their thesis.
4. To learn to effectively summarize ideas contained in a text.
5. Students will develop skill in writing short answer response essays, including, timed essays.
6. To improve their oral communication skills through a variety of means, including presentation, debate, and Socratic Seminar.

Course Content:
Seminar: analysis, interpretation and synthesis of food systems and technology principles through a written paper and oral seminars following 320 hours of field work in an approved position. The course integrates synergistic principles/activities from programme courses.

Students will be required to do the following on an ongoing basis: Take Cornell notes, write summaries, develop dialectical journals, and write critical essays. In the essays students will analyze various historical, social, cultural issues related to food science.

Mode of Delivery:
1. Lecture
2. Collaborative group work
3. Readings
4. Library and Internet research
5. Seminars

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Papers, essays, writing and oral language rubrics
2. Journals
3. Learning logs
4. Exams, quizzes
5. Participation
6. Observation
7. Conferencing
8. Final project

Core Reading Materials for the Course:
1. Scott A. Shikora, George L. Blackburn. (1996). *Nutrition support: theory and therapeutics.* Jones & Bartlett Publishers.
2. Michael Torosian (1995). *Food quality assurance: principles and practice.* Marcel Dekker.
3. Donald Kirby, Stanley J. Dudrick (1994). *Practical handbook of nutrition in clinical practice*. CRC Press.
4. Biswas, M.R. 1994. Nutrition, food production, and the environment. *In* M.R. Biswas & Mamdouh Gabr, eds. *Nutrition in the nineties: policy issues.* New Delhi, India, Oxford University Press.
5. Bean, J. C., Chappell, V. A. and Gillam, A. M. Reading Rhetorically: Brief Edition.
6. Hacker, Diana, A Writer's Reference MLA Handbook for Writers of Research Papers.

Recommended Reference Materials:
1. Victor R. Preedy, George Grimble, and Ronald Watson. (2002). *Nutrition in the Infant: Problems and Practical Procedures.* The new England Journal of Medicine. Volume 347:454-455.

2. Marcia Herrin. (2002). *Nutrition Counselling in the Treatment of Eating Disorders.* Routledge.

Title of Course: NUT 415: Research Project in Nutrition -- 60 Contact Hours

Purpose of Course:
The Purpose of Course of the course is to enlighten the students with skills on developing nutrition projects.

Expected Learning Outcomes:
By the end of the course, the students will be able to:

1. Explain the role of the preschool as a laboratory for nutrition education.
2. Describe the interaction between child development and nutrition.
3. Explain the link between food and nutrition concepts with the learning environment.
4. Evaluate the role of parents in raising healthy eaters and in preschool programme
5. Identify and evaluate social programmes in nutrition.

Course Content:
To evaluate the role of the media on children and consumers Development of eating habits and energy intake patterns of young children in the context of family factors and community outreach. The project areas will include: Preschools as laboratories for nutrition education, Preschool development and nutrition, Nutrition and the schools: Breakfast and lunch programmes, Home-to-school nutrition relationships, Preschool nutrition education, Parental styles/maternal control, Involving parents in the preschool nutrition programme, Media, commercials, and the toxic food environment, Creation of parent nutrition education newsletter, Consumer awareness and label reading .

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:

1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:

1. M. McWilliams (1993). *Nursery Schools and Day Care Centres: Laboratories for Nutrition Education.* In Nutrition for The Growing Year's pp. 223-250, Redondo Beach, CA: Plycon Press.

2. Endres, R. E. Rockwell, & C. G. Mense (2004) *Integrating Food and Nutrition Concepts into the Early Childhood Curriculum*. In J.B., Food, nutrition and the young child, pp. 268-303. New York: Pearson Merrill Prentice Hall.
3. J. Worobey & H. S. Worobey. (1999). *The Impact of a Two-Year School Breakfast Programme for Preschool-Aged Children on their Nutrient Intake and Pre-Academic Performance*. Child Study Journal, 29, pp. 113-131.
4. E. Satter (1999). *Raising a Healthy Eater in Your Community. Secrets of Feeding a Healthy Family*, pp. 178-199, Madison, WI: Kelcy Press.

Recommended Reference Materials:

1. L.L. Birch, J.O. Fisher & K.K. Davison (2003). *Learning to Overeat: Maternal Use of Restrictive Feeding Practices Promotes Girls' Eating in the Absence of Hunger*. American Journal of Clinical Nutrition, 78, pp. 215-220.
2. J.B. Endres (1999). *Healthy Children and Adolescents: Programmes and Services. Community Nutrition: Challenges and Opportunities*, pp. 153-162. Upper Saddle River, NJ: Prentice-Hall.
3. B. Endres, R.E. Rockwell, & C.G. Mense (2004). *Parent Involvement in Nutrition Education.* J. Food, nutrition and the young child, pp. 306-323. New York: Pearson Merrill Prentice Hall.
4. E.M. Ward (2002). *From Three to Six Years.* Healthy foods, healthy kids, pp. 119-134, Avon, MA: Adams Media Corp.

Title of Course: NUT 416: Applied Human Nutrition and Community Surveillance -- 45 Contact Hours

Purpose of Course:

The Purpose of Course of the course is to provide the learners with applied human nutrition and skills for conducting community surveillance.

Expected Learning Outcomes:

By the end of the course, the students will be able to:

1. Design nutrition surveys in the community.
2. Conduct nutrition surveys.
3. Develop reports on findings.
4. Describe appropriate recommendations for the analysis done

Course Content:

The course will entail hypotheses definition, and selection and combination of appropriate methods drawn from nutrition, epidemiology, anthropology, economics, psychology, sociology, education and political science. Students will also learn how to develop research designs, samples and analysis plans, as well as how to construct and pre-test the types of instruments commonly used in nutrition research and evaluation. The course will cover interviewer training, quality control, site operations, and data base management.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

5. Instructional material
6. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
The students are assessed through:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:
1. Jerome, N. W. and Ricci, J. A. (1997). *Food and Nutrition Surveillance: An International Overview.* American Journal of Clinical Nutrition, Volume 65, 1198S-1202S.
2. Young, H. and Jaspers, S. (1995). *Nutrition Matters: People, Food and Famine.* London, UK, Intermediate Technology Publications. ISBN 1-85339-243-X.
3. Whitney, E. N. and Rolfes, S. R., (1999). *Understanding Nutrition*. 8th ed. West/wadsworth, Belmont.
4. Stipanuk, H. M. (2000). *Biochemical and Physiological Aspects of Human Nutrition*. W. B. Saunders Company, Philadelphia,

Recommended Reference Materials:
1. Vander, J. S., and Dorothy, L. (2001). *Human physiology:* the mechanism of body function. 7th ed. Boston: McGraw-Hill.
2. Gropper, S. and Groff, *Advanced Nutrition and Human Metabolism*, 4th edition.

Title of Course: NUT 417: Current Issues in Food and Nutrition -- 45 Contact Hours

Purpose of Course:
The Purpose of Course of the course is to equip the learner with prevailing challenges in food and nutrition security. Students will also gain skills of providing guidance on nutritional care of sports men and women.

Expected Learning Outcomes:
At the end of the course, the students will be able to:
1. Discuss the metabolic and physiological alterations in selected diseases as a basis for diet modification for therapeutic Purpose of Courses.
2. Explain the relationships between nutrition, illness, and immunity.
3. Identify the current issues on the nutritional management of selected diseases and clinical conditions.
4. Explain the formulation strategy of basic nutrition care plan, with patient-centred and measurable nutrition goals.
5. Explain the principles of fitness and nutrition. Identify the social and cultural influences on food habits and exercise/activity patterns.
6. Describe the different exercise responses and nutritional requirements of women compared with those of men.

7. Evaluate current nutritional information with regard to its contribution to physical fitness. Explain the advantages/disadvantages of food formulations.

Course Content:
The course will include the principles and practice of nutritional support in clinical conditions, metabolic and physiological alterations in selected diseases as a basis for the implementation of dietary modifications.

The course topics will include: Anatomy, physiology and pathology of the gastrointestinal tract, Nutrition and gastro-oesophageal reflux disease (GERD), Nutrition and peptic ulcer disease, Nutrition and surgery of the upper gastrointestinal tract, Nutrition and inflammatory bowel disease, Nutrition and surgery of the lower gastrointestinal tract, Nutrition and short bowel syndrome, Nutrition support: enteral and parenteral nutrition, Nutrition and diabetes mellitus type I, Nutrition and diabetes mellitus type II, Nutrition, cancer and nutrition support, Nutrition and disease of the liver and pancreas, Neurological and psychiatric disorders, Nutrition and pre-end-stage renal disease, Management of obesity and cardiovascular diseases, Drug-nutrient interactions and poly-pharmacy.

Integration and application of principles of sound nutrition and physical activities to optimize the physiological, psychological, and social lifelong development of the individual and use of scientific principles and current technological advances to help assess and evaluate physical fitness, body composition, dietary patterns, energy expenditure, and their interrelationships.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:
1. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:

1. Giroux, I. (2008). *Applications and Case Studies in Clinical Nutrition*. Lippincott Williams & Wilkins, Baltimore, MD.
2. Mahan, L.K. and S. Escott-Stump, Editors. (2008). *Krause's Food & Nutrition Therapy*. 12th Edition. W.B. Saunders Company, Philadelphia, PA.
3. Jeukendrup, A. and M. Gleeson (2004). *Sport Nutrition: An Introduction to Energy Production and Performance*, Human Kinetics.
4. Manore, M. and J. Thompson (2000). *Sport Nutrition for Health and Performance,* Human Kinetics.

Recommended Reference Materials:

1. American Dietetic Association. *ADA Nutrition Care Manual*. Online resource available with subscription (http://www.eatright.org).
2. McArdle, W., F. Katch, et al. (1999). *Sports & Exercise Nutrition, Lippincott*: Williams and Wilkins.
3. Whitney, E. and S. Rolfes (2005). *Understanding Nutrition*, Wadsworth.

Title of Course: NUT 418: Food Industry Management - 45 Contact Hours

Purpose of Course:
Enable the students to improve all aspects of the operational performance of a business or any other type of organization. It focuses on meeting the needs and expectations of customers/clients by moving the focus of quality to other functional areas as well.

Expected Learning Outcomes:
At the end of the course, the students will be able to:
1. Describe the methods and techniques for the improvement of quality and overall operational performance.
2. Discuss the Total Quality Management (TQM) Model in order to understand the human components of, the tools and techniques for TQM, International organization of standardization (ISO) quality management system standard, and the management of change for TQM.
3. Enable students to analyze, organize and critically evaluate information and manage themselves in such a way that they can become more effective and efficient "quality" employees.

Course Content:
The human components of the tools and techniques for TQM: Introduction to quality and total quality management, Leadership, quality culture and self-management for life excellence, Involving people in the quality process, Quality of work life (QWL) Measurement and the systems, tools and techniques for quality improvement.

Concepts and principles of systems for quality: Quality management system (QMS) standard, Strategies for implementing change, Managing change and implementing TQM, Sustaining continuous improvement.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Role plays
4. Experiential learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. CAT 30%
2. Final examination 70%

Core Reading Materials for the Course:

1. Reis, A. and Trout, J. *The 22 Immutable Laws of Marketing Violate Them at Your Own Risk.* Management Guide John Reh Reviews.
2. Howard S Gitlow. (2001). *Quality Management Systems: A Practical Guide.* CRC Press.

Recommended Reference Materials:

1. Jay J. Schlickman (2003). *ISO 9001:2000 Quality Management System Design*. Artech house, Inc, 685. Canton Street.
2. Harold Kerzner. (2009). *Project Management: A System Approach to Planning, Scheduling and Controlling.* Wiley Publishers.

Title of Course: NUT 419: Meat Technology -- 45 Contact Hours

Purpose of Courses:

To enable the student to become acquainted with the scientific principles involved in the conversion of muscle to meat. A review of the anatomical, physiological, developmental, and biochemical aspects of muscle and its conversion to meat will be taught. An introduction to aspects of fresh and processed meat technology, meat preservation, and meat microbiology, as well as discuss current issues in meat science.

Expected Learning Outcomes:

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

1. Describe of muscle biology, muscle conversion to meat, meat quality and factors affecting meat quality.
2. Define, meats, equipment, additives and legislation associated with meat processing.
3. Discuss traditional meat processing.
4. Predict major problems that can occur in meat products and potential solutions.
5. Define advanced technologies for meat processing.
6. Development of personal and transferable skills (especially practical and report writing skills).

Course Content:

Course introduction: Meat and human evolution, Fundamentals of muscle biology, Muscle conversion to meat, Meat quality and Nutritional value of meat.

Traditional meat processing: Common meat products on the market, Comminuting technology, Fundamentals of meat curing technology, Battering and breading technology, Meat additives (NaCl, binders, fillers, colorants, flavouring agents, spices, smoking agents, antioxidants), Surimi technology, Meat packaging and Meat microbiology.

Advanced technologies for meat processing: Application of high hydrostatic pressure to meat and meat processing, Functional properties of bioactive peptides derived from meat proteins, New approaches for the development of functional meat products, Meat decontamination by irradiation, Perspectives for the active packaging of meat products and Extraction of valuable compounds from meat by-products.Discuss current issues in meat science.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Role plays
4. Experiential learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:
1. Lawrie, R. A. Pergamon. (1998). *Meat Science*. (6th edition).
2. Varnam, A. H. (1995). *Meat and Meat Products: Technology, Chemistry and Microbiology.*
3. Price, J. F. and Schweigert, B. S.(1989). *The Science of Meat and Meat Products* (3rd edition). Published by Food and Nutrition Press.
4. Judge, M., Aberle, E., Forrest, J., Hedrick, H. and Merkel, R. (1994). *Principles of Meat Science* (3rd edition). Published by Kendall/Hunt Publishing Co.

Recommeded Reference Materials:
1. NIIR Board of Consultants and Engineers. (2009). *Fresh meat technology hand book.* Asia Pacific Business Press.
2. Yiu H. Hui, Wai-Kit Nip. (2001). *Meat Science and Applications*. Marcel Dekker.
3. Joseph, K. and Ledward, D. (2002). *Meat Processing: Improving Quality*. Amazon Publishers.

Title of Course: NUT 421: Experimental Foods -- 45 Contact Hours

Purpose of Courses:
Students will be equipped with basic skills on scientific principles involved in the preparation of foods such as milk, vegetables and fat families. It also deals with food changes under different conditions such as preservation, storage and fermentation. The acquired skills will be used to improve the existing recipes for local acceptability.

Expected Learning Outcomes:
By the end of this course students should be able to:
1. Gain some understanding of the scientific concepts involved in food preparation.
2. Apply the concepts learned to prepare foods of high nutritional and aesthetic quality and value.
3. Describe the chemical, biochemical and physical nature of foods when subjected to different conditions.
4. Formulate and standardize a recipe using locally available foods (traditional dishes).

Course Content:

This course will begin with an introduction to food experimentation which will include the Purpose of Course of food experimentation and the various ways of evaluating food: the use of sensory and objective methods and discuss the factors that affect food acceptance.

The food groups to be used for experimentation will include proteins: the sources of proteins with specific reference to meat, fish, poultry, dairy products and eggs; the effects of heat on them; the effects of acid alkaline and salt on protein, fruits and vegetables including legumes and the effect of heat, salt, bicarbonate of soda, fat and water on the proteins.
Carbohydrates: this will include a brief discussion of cereals and flour; the types of cereals; caramelisation, and gelatinization effect which involves heat. Fats and oils: this will include the chemical and physical changes in various types of fats and oil with reference to their processing.

Leavening agents: which will include the types and both the chemical and physical changes; yeast breads and quick breads including cakes and pastries.
Finally, the course will touch on the issues of food preservation: food spoilage, food poisoning, food safety, food additives and food acceptance.

Mode of Delivery:

1. lectures
2. group discussions
3. experiments

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Recommended Reference Materials:

1. McWilliams, M. (1997). *Foods Experimental Perspectives* 3rd ed. *Boston*: Merrill.
2. Campbell, et al, (1978). *The Study of Experimental Foods 2nd ed*. Boston: Houghton Mifflin Company.

Recommended Reference Materials:

1. Fennema, O. R. (1996). *Food chemistry 3rd New York*: Marcel, INC.
2. Charley, H. (1982). *Food science New York*: John Wiley and Sons.
3. Wells, M. R. et al (1997). *Food composition and analysis*. New York: Van Nostrand Reinhold.

Title of Course: NUT 422: Nutrition Counselling- 45 Contact Hours

Purpose of Course:
This course provides a strong grounding in basic skills needed to advise or counsel people in this area.

Expected Learning Outcomes:

1. Explain the processes involved in the training of counsellors in micro skills.
2. Demonstrate the skills involved in commencing the counselling process and evaluation of non-verbal responses and minimal responses.
3. Demonstrate reflection of content, feeling, both content and feeling and its appropriateness to the counselling process.
4. Develop different questioning techniques and to understand risks involved with some types of questioning
5. Show how to use various micro-skills including summarizing, conformation, and reframing.
6. Explaining the importance of different types of non-verbal response in the counselling procedure
7. Report on the discussion of the minor problem with an anonymous person experiencing that problem.
8. Demonstrate self-destructive beliefs and show methods of challenging them, including normalizing.
9. Explain any negative aspects of dependency in a case study.

Course Content:
Learning Specific Skills - Learning methods; listening and Bonding - Meeting and greeting; helping the client relax; listening with intent.

Reflection: Paraphrasing- reflection of feeling; client response to reflection of content and feeling. Questioning-open and closed questions; other types of question and goals questioning.

Interview technique- summarizing; confrontation and reframing. Changing Beliefs and Normalizing - Changing self-destructive beliefs; irrational beliefs and normalizing.

Finding Solutions - Making choices; facilitating actions; gestalt awareness and psychological blocks. Ending the Counselling-terminating the session; closure; further meetings; dependency and comforting dependency.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:

1. Sara, G. (2005). *Counselling for Eating Disorders.*
2. Katharine C. and Amy J. (1998). *Nutrition Counselling & Communication Skills*.
3. Richard R. and Diane M. W. (1999). *Counselling in Sports Medicine.*

Recommended Reference Materials:

1. Linda, G. S. (1997). *Nutrition Counselling Skills for Medical Nutrition Therapy.*
2. Marcia, H. (2003). *Nutrition counselling* in the treatment of eating disorders.
3. Linda G. S. (2009). *Nutrition counselling* skills for the nutrition care process.

Title of Course: NUT 423: Health Promotion- 45 Contact Hours

Purpose of Course:

The Purpose of Course of the course is to equip the learner with skills on "how to do" health promotion and the conceptual, ideological, and political issues which underlie health promotion practice.

Expected Learning Outcomes:

By the end of the course, students will be able to:

1. Describe the meanings and determinants of health and their implications.
2. Explain the historical context of current approaches to health promotion.
3. Describe the health promotion activities in terms of underlying assumptions and ideology.
4. Describe the main strategies, theories and principles of health promotion.

Course Content:

The course will include: review of the concept of health and its determinants, history of health promotion, models of health promotion, concepts & principles empowerment, theory and it's use, components of change, ecological models of health; theories of health behaviour, Health Belief Model, Theory of Reasoned Action and planned behaviour.

Mode of Delivery:

1. Lecture
2. Discussion
3. Group exercises.

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Seminar paper and presentation
2. CAT
3. Final examination

Core Reading Materials for the Course:

1. Glanz K., Rimer, B. K., Lewis, F. M. (2002). *Health Behaviour and Health Education:* Theory, Research, and Practice (3rd Ed). San Franscisco: Jossey-Bass.

2. Hawes, H and Schotchomer, C. (1993). *Children's Health: Children as Communicators of Facts for Life*. St Albans. TALC.
3. Dhillon, H. S ., Deutsch, C. (1994). *A Human Relations, Communication and Leadership Programmes to Strengthen the Links among Health Workers, Supervisors, and the Community*. Geneva: WHO.
4. UNICEF (1993). *Facts for Life, a Communication Challenge*. -Oxford: UNICEF.

Recommended Reference Materials:

1. Population Services International (1991). *Social Marketing and Communication for Health*. Washington. D.C: PSI.
2. Lutuma, J. F. W and Bennett, F. J. (1996). *Health Education in Eastern Africa, a challenge to schools.*
3. Health Promotion Glossary: http://www.who.int/hpr/NPH/docs/hp_glossary_en.pdf
4. Saskatchewan Health.(1999). *A population health promotion framework for Saskatchewan health districts*. 1999:http://www.health.gov.sk.ca/ic_pub_3793_skhlthframewk.pdf

Title of Course: NUT 424: Sports Nutrition- 45 Contact Hours

Purpose of Course:
The Purpose of Course of the course is to equip the students with skills of providing guidance on nutritional care of sports men and women

Expected Learning Outcomes:
By the end of the course, the students should be able to:
1. Explain the principles of fitness and nutrition
2. Identify the social and cultural influences on food habits and exercise/activity patterns.
3. Discuss the fitness and nutrition considerations during various stages of the life cycle
4. Describe the different exercise responses and nutritional requirements of women compared with those of men.
5. Evaluate current nutritional information with regard to its contribution to physical fitness.
6. Explain the advantages/disadvantages of food formulations

Course Content:
Integration and application of principles of sound nutrition and physical activities to optimize the physiological, psychological, and social lifelong development of the individual and use of scientific principles and current technological advances to help assess and evaluate physical fitness, body composition, dietary patterns, energy expenditure, and their interrelationships.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies

4. Individual and work-based assignment
5. Partnership exercises: community entry and situation analysis
6. Assignment of mentors for follow-up, support and assessment in partnership practice

Instructional Materials:
Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:
1. A term paper (30 marks)
2. A seminar presentation on key concepts and their application in local contexts (10 marks)
3. An end of semester written University Examination (60 marks)

Core Reading Materials for the Course:
1. Jeukendrup, A. and Gleeson, M. (2004). *Sport Nutrition*- An Introduction to Energy Production and Performance, Human Kinetics
2. Manore, M. and Thompson, J. (2000). *Sport nutrition for health and performance, Human Kinetics.*

3. McArdle, W., Katch, F. et al. (1999). *Sports & Exercise Nutrition*, Lippincott: Williams and Wilkins.
4. Whitney, E. and Rolfes. S. (2005). *Understanding Nutrition*, Wadsworth.

Title of Course: NUT 425: Practicum -- 45 Contact Hours

Technical attachment

Title of Course: NUT 426: Programme Design, Monitoring and Evaluation -- 45 Contact Hours

Purpose of Course:
The Purpose of Course of this course is to provide the procedures in designing, monitoring and evaluation of programmes.

Expected Learning Outcomes:
By the end of the course, the students will be able to:
1. Describe the process of project planning.
2. Identify the steps in development of problem trees
3. Describe log frames.

Course Content:
The topics to be covered include: the planning process, history of planning, planning approaches, methods and strategies, steps and techniques in planning, health planning and primary health care, community involvement in planning and planning matrix. It will also include rapid assessment procedures, problem tress, SWOT analysis, application for funds, log-frame: objectives and outputs; inputs and activities, budgets; risk and analysis and monitoring and evaluation frameworks.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment

1. Seminar paper and presentation
2. CAT
3. Final examination

Core Reading Materials for the Course:

1. Gosling, L. and Edwards, M. (2003). *Toolkits – A Practical Guide to Planning, Monitoring, Evaluation and Impact Assessment*. London: Save the Children.
2. Abel-Smith, Brian. (1994). *An Introduction to Health Policy, Planning and Financing.* London: Longman.
3. Green, Andrew. (1999). *An Introduction to Health Planning in Developing Countries*. New York: Oxford University Press.

Recommended Reference Materials:

1. Kleczowski, B.M. (1976) *Approaches to Planning and Design of Health Care Facilities in Developing Areas,* Volume 1. Geneva: WHO.
2. NORAD. (1999). *Logical Framework Approach.* NORAD.
3. Reinke, W. A. [Ed] (1988) *Health Planning for Effective Management*. New York. Oxford University Press.

Title of Course: NUT 427: Nutrition in Emergencies -- 45 Contact Hours

Purpose of Course:

The Purpose of Course of this course is to equip the learner with skills for managing nutrition deficiencies in emergencies situations.

Expected Learning Outcomes:

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

1. Explain the relationship of health, safety, and nutrition.
2. Identify practices which will assess, appraise and promote "good" health and nutrition in emergencies.
3. Discuss the principles of implementing and managing a safe early childhood education environment.

Course Content:

The course will include: Health and the Young Child: this involves the relationship between heath, safety and nutrition, factors causing malnutrition in children, common forms of malnutrition and interventions. The effects of safety for children and the benefits of health and learning and their relationships, Safety of the Young Child: this involves

creating a health and safety environment for children, the Purpose of Course of licensing, handling issues of negligence and how it affects child health and development.

Offering first aid in emergencies, handing accidents in children, distinguishing between abuse and neglect, and basic instruction methods for children, Foods and Nutrients: this basically involves the diet for children and the related recommended allowance for sustainable growth and development and nutrition and the Young Child: involve health eating habits in children including food handling and safety precautions during food preparation and feeding. Storage and ways of preventing food contamination and developing of food borne illness.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Seminar paper and presentation
2. CAT
3. Final examination

Core Reading Materials for the Course:

1. Ebrahim, C.J. (1983). *Nutrition in Mother and Child Health*. London. Macmillan Press Ltd.
2. Eschleman M. (1984). *Introductory Nutrition & Diet Therapy*; J.P. Lippincott Company/Philadelphia; 1984 or newest edition.
3. Felicity S.K. and Burgess A. (2002). *Nutrition for Developing Countries*, 2nd edition. Oxford Medical Publications.

Recommended Reference Materials:

1. Passmore, R, Eastwood, M. A., et al. (1986). *Human Nutrition & Dietetics*. 8th Ed.
2. Jansen, A.A.J and Horelli, H. T. (1987). *Food and Nutrition in Kenya*. A historical Review.
3. Savage, F. and Burges, A. (1993). *Nutrition for Developing Countries*. New York. Oxford University Press.

Title of Course: NUT 428: Food Analysis- 60 Contact Hours

Purpose of Courses:

Laboratory analysis will provide students with experience of analytical techniques and instrumentation used in food analysis. Sampling techniques and theory and practice of chemical and physical methods of food analysis help in determination of food composition.

Expected Learning Outcomes:

1. To demonstrate gravimetric, colorimetric, titrimetric, chromatographic and spectrometric analyses as applied to foods.
2. To recognize food constituents and characteristics important in quality control and research laboratories.
3. To perform a range of chemical analyses of food components.
4. To search the literature, evaluate data, solve problem and write scientific reports related to food composition and analysis.

Course Content:
Introduction to food analysis: Sampling and sample preparation, Evaluation of analytical data. Lab overview: guidelines, safety, and report writing.

Gravimetric analysis of major food components: analysis of phytosterols in foods, diets, and dietary supplements, analysis of folate, in particular, 5-methyltetrahydrofolate, in foods and diets and nutrient analyses including fatty acids (including *trans* fatty acids), cholesterol, vitamin C, sugars, starch, dietary fibre, minerals and proximate.

Chemical analysis of major food components: nutrient value analysis (e.g. water, ash, fat, protein, fibre), fibre (e.g. soluble, insoluble, insulin), sugar spectrum (e.g. glucose, fructose, saccharose, lactose), preservatives (e.g. sorbic acid, benzoic acid, propionic acid, phB ester), minerals and trace elements (e.g. calcium, magnesium, iodine),Vitamins and their derivatives (e.g. vitamin B12, vitamin D3, vitamin K), contaminants and all types of residue, identification of foreign bodies and preparative-gravimetric determination.

Laboratory equipment operation: Spectroscopy; Analysis of pigments by UV/Vis infrared spectroscopy and Chromatography. Problem solving in food analysis – Team project. Review & Oral presentation of the team project.

Mode of Delivery:
1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:
1. Overhead projector
2. LCD power-point presentation

Course Assessment:
1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Nielsen, S. S. (2003). *Food Analysis*. Springer.
2. Gruenwedel, John R. Whitaker (1984). *Food analysis: Principles and Techniques (VOL 2). Physiochemical techniques.* Marcel Dekker Inc.
3. Roger, W., Harriett W. and Aders, N. (1998). *Quality in the Food Analysis Laboratory.* The Royal Society of Chemistry.

Recommended Reference Materials:

1. AOAC (Association of Official Analytical Chemists). *Chemical Analysis of Foods.* (1996).
2. Food Trade Review (2005).

Title of Course: NUT 429: Fruit and Vegetable Technology -- 45 Contact Hours

Purpose of Courses:

In this course students will again concepts on raw material handling, storage and preparation; processing and preservation of fruits and vegetables; production of fermented food products from vegetables; application of HACCP to fruit and vegetable processing; post-harvest changes in fruits and vegetables.

Expected Learning Outcomes:

1. Demonstrate an understanding of the biochemistry and physiology of harvested fruits and vegetables.
2. Describe the basic steps involved in the production of processed fruits and vegetables.
3. Describe the principles and practices employed to maintain the quality of fruits and vegetables.

Course Content:

Physiology of fruits and vegetables: Structure, Cellular Components and Composition of Fruits and Vegetables; Harvesting, Post harvest Handling and Physiology of Fruits and Vegetables; Principles and Methods of Preservation of Fruits and Vegetables and Food Additives.

Technology: Packaging Technology for Fruits, Vegetables and their Products, Storage Systems of Fruits, Commercial Canning of Fruits and Vegetables, fruit Juices and Juice Beverage, Pickles: Technology of Preparation, Drying of Fruits and Vegetables, Irradiation of Fruits, Vegetables and their Products, Lactic Acid Fermented Beverages, Vinegar: Composition and Production and Fermentative Utilization of Waste from Food Processing Industry.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Role Plays
4. Experiential Learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Smith, D. S., Cash, J. N., Nip, W. K and Hui, Y. H. (1997). *Processing Vegetables: Science and Technology*. Lancaster, PA: Technomic Publishing Company Inc.
2. Wills, R. H. H., Lee, T. H., Graham, W. B. and Hall, E. G. (1981). *Post Harvest: An Introduction to the Physiology and Handling of Fruit and Vegetables*. Westport, Connecticut: The AVI Publishing Company, Inc.
3. Kays, S. J. (1991). *Post harvest physiology of perishable plant products*. New York: An AVI Book.

Recommended Reference Materials:

1. Arthey, D. and Ashurst, P. R. (1996). *Fruit Processing. Blackie Academic and Professional*. Glasgow, UK: Bishop Briggs.
2. Jangen, W. (Editor). (2002). *Fruit and Vegetable Processing: Improving quality*. CRC Press. Cambridge, England: Woodhead Publishing Limited.
3. Ting, S. V. and Rouseff, R. L. (1986). *Citrus fruits and their products: Analysis and Technology*. Marcel.

Title of Course: NUT 430: Food Biotechnology- 45 Contact Hours

Purpose of Courses:

This course will enable students to acquire outline principles used in production of genetic modified foods.

Expected Learning Outcomes:

1. Describe enzymes currently used in food bioprocess.
2. Discuss potential use of recombinant DNA technology in the production of novel food ingredients or new food products.
3. Recognize biotechnology in fats & oils, flavour and food industry.

Course Content:

Introduction to Food Biotechnology: Importance, Advances and Trends. Review of Nucleic Acid Biochemistry, Genetic Engineering Techniques: Recombinant DNA Techniques, Cloning Strategies, Specific Examples, e.g., Dairy Starter Cultures and Dairy Enzymes, Caseins.

Microbial Synthesis and Production: Flavours Vitamins, Impact of Biotechnology on Nutritional Quality of Food Plants Enzyme Biotechnology: Enzyme Immobilization, Techniques, Applications of Immobilized Enzymes in Food Industry, Enzymes in Organic Solvents, e.g., Lipases, Enzyme Generation of Flavour and Aroma Compounds. Biotechnology Applied to Fats and Oils: Nutritional Value, Flavour and Lipid Modifications.

Tissue Culture Techniques, Microbial Transformations, e.g., Steroids, Non-steroids, Antibiotics, Recent Applications of Biotechnology, Regulatory and Social Aspects of Biotechnology, Economic Aspects, Single-Cell Proteins, Starter Cultures, e.g., Dairy, Meat and Poultry, and Vegetable Products, Potential Impact of Biotechnology on Food Industries and Downstream Processing Techniques.

Mode of Delivery:

1. Lecture
2. Practical
3. Group work

Instructional Materials:

4. Use of audiovisuals e.g. power-point, posters, overhead projector, etc

Course Assessment:

1. Pharmaceuticals. CRC press. Continuous assessment tests
2. Final written examination
3. Practical work

Core Reading Materials for the Course:

1. Gauri, S. M. (1992). *Food Biotechnology-Techniques and Applications*. Lancaster, PA: Technomic Publishing Co., Inc.
2. King, R. D. and Cheetham, P. S. J. (1988). *Food Biotechnology - 2*. Elsevier Applied Science, NY.
3. Rogers, P.L. and Fleet, G.H. (1989). *Biotechnology and the Food Industry*

Recommended Reference Materials:

1. Owen, R. F. (1985). *Food Chemistry*. Marcel Dekker, Inc., NY.
2. Dietrich, K. (1987). *Food Biotechnology*. Marcel Dekker, Inc., NY.

Title of Course: NUT 431: Food Processing and Preservation -- 45 Contact Hours

Purpose of Courses:

The students will learn the principles and operations of food processing and preservation.

Expected Learning Outcomes:

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

1. Define food science, magnitude, division and interdependent activities of the food industry, food and man).
2. Discuss the constituents of foods, properties and significance Water, Carbohydrates, Proteins, Fats, Other Constituents.
3. Discuss the importance of enzymes in food processing. Effect of processing and preservation on nutritive aspects of food constituents (vitamins, minerals, enzymes, other.)
4. Describe the factors that influence microbial activity in foods (moisture, water activity, oxidation-reduction ppotential, temperature, acidity, inhibitors) temperature in microbial activity in foods and food spoilage.

Course Content:

General characteristics of food raw materials; harvesting, assembling and receiving of raw materials, methods of food preservation; processing objectives including factors influencing food acceptability and preferences; packaging; water, waste disposal and sanitation.

Mode of Delivery:

1. Lecture
2. Practical
3. Group work

Instructional Materials:

5. Use of audiovisuals e.g. power point, posters, overhead projector, etc

Course Assessment:

1. Continuous assessment tests
2. Final written examination
3. Practical work

Core Reading Materials for the Course:

1. Geankoplis, C. J. (1993). *Transport Processes and Unit Operations*. 3rd Edition. Englewood Cliffs, NJ: Prentice Hall.
2. Toledo, R. T. (1991). *Fundamentals of Food Processing Operations*. 2nd Edition. New York, NY: Van Nostrand Reinhold,

Recommended Reference Materials:

1. Earle R. L. and M. D. Earle, *Unit operations in Food processing*. http://www.nzifst.org.nz/unitoperations/contents.htm.
2. Bruce Traill and Klaus G. Gruner. (1997*). Product and process innovation in the food industry*. Blackle Academic and Professional, U.K.
3. Gordon L. R. *Food Packaging – Principles & Practice*. Marcel Dekker, Inc.
4. Geankoplis, C. J. (1993). *Transport Processes and Unit Operations*. 3rd Edition. Englewood Cliffs, NJ: Prentice Hall.

Title of Course: NUT 432: Agricultural Economics -- 45 Contact Hours

Purpose of Course:

The Purpose of Course of the course is to equip the students with the current occurrences that affect the community's agricultural economy.

Expected Learning Outcomes:

By the end of the course, the student will be able to:

1. Describe the economic theory.
2. Apply the economic theory in the community practice.
3. Describe the economy in relation to peasant production.
4. Design and implement agriculture interventions in improving the peasant production.

Course Content:

This course deals with the impact of social and economic change on peasant farming. The term "peasants" is defined here as family farmers only partially integrated into incomplete or imperfect markets. The peasant farmer can also, more familiarly be termed a subsistence or semi-subsistence farmer. However, the term peasant denotes a more complete socio-economic perception which is more suited to the Purpose of Courses of this course.

The topics will include: Contributions of the agricultural sector to development, Peasants, economics and political economy, Neoclassical theory of farm production, Farm size and factor productivity, Elements of peasant political economy, The Theory of the Optimizing Peasant economy, Types of peasants (Risk adverse, drudgery adverse, farm household, share cropping peasant), Peasants and environment agriculture and international trade, Agriculture marketing.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:

Use of audiovisuals e.g. pictures, posters, overhead projector, etc.

Course Assessment:

1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:

1. Ghatak, S. and Ingersent, K. (1984). *Agriculture and Economic Development*. Wheatsheaf Books, Ltd.
2. Ellis, F. (1993). *Peasant Economics: Farm Households and Agrarian Development*. Second edition. Cambridge University Press, Melbourne.
3. Shanin, T. (1971). *Peasants and Peasant Societies.* Harmondsworth, Penguin.
4. Colman, D. and Young, T. (1993). *Principles of Agricultural Economics: Markets and Prices in Less Developed Countries*. Melbourne: Cambridge University Press.

Recommended Reference Materials:

1. Deere, C. D. and De Janvry, A. (1979). *A conceptual framework for the empirical analysis of peasants*. American Journal of Agricultural Economics. 61(4).
2. Hunt, D. (1979). *Chayanov's Model of Peasant Household Resource Allocation and Its Relevance to Mbeere Division, Eastern Kenya*. Journal of Development Studies. Vol 15.
3. Mellor, J. W. (1963). *The Use and Productivity of Farm Family Labour in the Early Stages of Agricultural Development*. Journal of Farm Economics. Vol 48.
4. Bevan, D. L., A. Bigsten, P. Collier, and J.W. Gunning. (1987). *Peasant Supply Response in Rationed Economies*. World Development, Vol 15, no. 4.
5. Norton, G. W. and Alwang, J. (1993). *Introduction to the Economics of Agricultural Development.* McGraw-Hill, 1993. Chapter 12.

6. Barbier, E. B. (1989) .Cash crops, food crops, and sustainability: the case of Indonesia. *World Development*, Vol 17, no. 6.

Title of Course: NUT 433: Agriculture Extension and Rural Sociology -- 45 Contact Hours

Purpose of Course:
A review of contemporary theory and research associated with the sociology of agriculture and food systems. This course will give students an opportunity to learn about changes in the agricultural and food system.

Expected Learning Outcomes:
When the course is completed, the learner will demonstrate the ability to:

1. Describe the major theoretical perspectives for interpreting agricultural change of the last 30 years.
2. Describe what is meant by the structure of agriculture and explain some of the changes and consequences of change in the structure of agriculture.
3. Explain the role of agricultural science and the role of regulations in influencing the structure of agriculture.
4. Describe key features of the alternative food system movement and evaluate its meanings and strategies.
5. Begin to explain the role of culture in the evolution of the agro-food system, with a focus on consumers, farmers, and farm workers.
6. Familiar with a wide range of theoretical concepts and approaches, in order to be able to understand the complexity of rural and regional development.
7. Use a variety of methodological issues enabling them to study and analyze the multiple facets of rural and regional development.

Course Content:
The course can be divided into three major sections, with the first focuses on some of the overarching theoretical perspectives for studying the sociology of agriculture, the second focuses on specific actors in the agro-food system and their experience of change, the third focuses on the emergence of alternative structures of agriculture and the growing role of consumers in reshaping the structure of production.

The course begins by exploring the "New" Sociology of Agriculture, reviewing literature related to the political economy of agriculture, agricultural industrialization and the Goldschmidt Hypothesis, globalization of agro-food production, commodity chain analysis, and views of regulation and the application of human ecology to the study of agriculture in urbanized areas.
The focus then shifts to an in depth look at two distinct sets of actors in the agro-food system, the family farms of central Illinois and farm workers in California.

The final section shifts to look at the emergence of alternative agricultural structures, such as the sustainable agriculture movement, organic agriculture, and the rise of local food systems. Both the characters of these alternatives as well as the reasons for their emergence will be considered.

This section will conclude with a closer look at the role of consumers in reshaping the agro-food system as well as the relevance and legacy of agrarian thought in an increasingly urban society.

Mode of Delivery:

1. lectures
2. group discussions
3. experiential learning

Instructional Materials:

1. overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes 10%
2. Seminar paper and presentation 30%
3. CAT 10%
4. Final examination 50%

Core Reading Materials for the Course:

1. Renting, H. et al., (2009). *Exploring Multifunctional Agriculture: A review of conceptual approaches and prospects for an integrative transitional framework*, Journal of Environmental Management. doi:10.1016/j.jenvman.2008.11.014.
2. Wilson, G. (2009). *The Spatiality of Multifunctional Agriculture: A Human Geography Perspective.* Geoforum doi:10.1016/j.geoforum.2008.12.007.
3. Houston, P. (2005). *Revaluing the Fringe: Some Findings on the Value of Agricultural Production in Australia's Peri-Urban Regions*. Geographical Research 43, pp. 209–223.
4. Gallent, N., Bianconi, M. and Anderson, J. (2006). *Planning on the Edge: England's Rural Urban Fringe and the Spatial Planning Agenda, Environment and Planning B*: Planning and Design 33, pp. 457 – 476.

Recommended Reference Materials:

1. Wells, M. J. (1996). *Strawberry Fields: Politics, Class and Work in California Agriculture.* Ithaca and London: Cornell University Press.
2. Allen, P. (2004). *Together at the Table: Sustainability and Sustenance in the American Agrifood System*. University Park, PA: The Pennsylvania University Press.
3. Salamon, S. (1992). *Prairie Patrimony: Family, Farming and Community in the Midwest. Chapel Hill and London*: University of North Carolina Press.
4. Roep, D. and Wiskerke, J. S. C. (2004*). Reflecting on novelty production and niche management in agriculture*, in: J. S. C. Wiskerke & J. D. van der Ploeg (eds.), Seeds of transition: essays on novelty production, niches and regimes in agriculture, Assen: Royal Van Gorcum BV, pp. 341 – 356.

Title of Course: NUT 434: Cultural Aspects of Food -- 45 Contact Hours

Purpose of Courses:

This course is designed to provide students with a comprehensive ability to analyse world food situations and the problem of hunger, using an ecologically/food system approach. Various components of the food system will be analyzed to identify causes of hunger. Three faces of hunger-acute, chronic, and hidden hunger will be examined and existing and proposed strategies will be evaluated using scientific measures as well as through the voices of people.

Expected Learning Outcomes:
Upon successful completion of the course and based on lectures, readings, assignments, videos, guest speakers, and class discussions the student will be able to:

1. Describe the social, physiological, psychological, and cultural factors that influence food choices through out the life cycle.
2. Compare nutrition information from a scientific perspective to distinguish scientific findings from untested claims.
3. Identify food patterns that increase the risk of chronic health problems and recommend modifications to the diet to reduce the risk of developing these health problems.
4. Assess his/her diet based on the recommendations from scientific health related organizations.
5. Identify the potential causes of food borne illness and procedures to prevent food borne illness.
6. Identify the causes of hunger in developing and industrialized countries.

Course Content:
Food choices as affected by religious beliefs, economics, family traditions, political, social and historical factors. Meanings of food and food-related behaviours of cultures and the way these patterns influence food consumption patterns among each other.

Global perspectives in a comparative context on food ways, beliefs, habits and cultural practices models. Globalization of eating patterns and the resistance to homogenizing forces.

Familiarize with relevant research and latest findings regarding food practices and nutrition related health problems of various cultural groups.

International frames on long-standing and newly emerging issues focusing on causes and effects of famine, exploding populations and enhanced food production on current and future food supplies, and nutritional value of diet.

Food System Approach Components of Food System, Food Production, food distribution and cultural aspects. Analysis of factors of food production: land, soil technology, price of imports and case studies.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Case Studies
4. Individual And Work-Based Assignment

Instructional Materials:
1. Overhead projector
2. LCD power point presentation

Course Assessment:
1. Quizzes
2. Seminar paper and presentation
3. CAT
4. Final examination

Core Reading Materials for the Course:
1. David L. L. S. (Ed). (1995). *The Colour of Hunger: Race and Hunger in National and International Perspective.* Rowman and Littlefield. Jean Dreze, Amaptyasen and Athar Hussain, Ed
2. Frances, M. L. and Joseph, C. (1986).*World Hunger Institute for Food and Development Policy*, Oakland, CA.,
3. World Food Security. (1994). *Prospects and Trends*. Brown University.

Recommended Reference Materials:
1. *Political Economy of Hunger.* (1995). Oxford: Clarendon Press.
2. *Myths of African Hunger.* A report published by World Hunger, Brown University.
3. *Brave New Third World: Strategies for Survival in Global Economy.* (1989). Institute for Food and Development Policy, Oakland, CA.

Title of Course: NUT 435: Food and Nutrition Security -- 45 Contact Hours

Purpose of Course:
The Purpose of Course of the course is to equip the students with skills of improving the food and nutrition security status in the communities of practice.

Expected Learning Outcomes:
By the end of the course, the students should be able to:
9. Describe the factors that affect attitudes and decisions about food.
10. Explain the current issues of body image and food marketing.
11. Apply the various food preparation methods
12. Investigate the food heritage and food industries.

Course Content:
The topics will include: The concept of food and nutrition security: Levels and dimensions, The link to Poverty and attainment of MDGs, Project Cycle, Triple A, Assessing situation of Food and nutrition security, Actions to improve food and nutrition security, How to integrate food and nutrition consideration in working contexts.

Mode of Delivery:
1. Lectures
2. Group discussions
3. Case studies
4. Individual and work-based assignment

Instructional Materials:

1. Use of audiovisuals e.g. pictures, posters, overhead projector, etc.
2. Community partnership sites

Course Assessment:

1. A term paper (30 marks).
2. A seminar presentation on key concepts and their application in local contexts (10 marks).
3. An end of semester written University Examination (60 marks).

Core Reading Materials for the Course:

1. Harold G. H. (1994). *Food and Agricultural Policy: Economics and Politics.* New York.

Title of Course: NUT 436: Leadership -- 45 Contact Hours

Purpose of Course:
To ensure students get leadership skills that identify and meet team needs in order to achieve project objectives. In this course, they will be transition to a leader who can inspire a diverse team to work together and deliver customer success.

Expected Learning Outcomes:
By the end of the course, the students should be able to:

1. Describe leadership skills that build and sustain high-performing project teams.
2. Discuss effective team performance through the Leadership Services Model (LSM).
3. Identity through vision, Purpose of Course and commitment of strong teams.
4. Foster positive and productive team communication and define ground rules.
5. Protect the team and convert conflicts into advantages that promote high performance.
6. Demonstrate leadership abilities.

Course Content:
Introduction: harnessing the power of collaboration to deliver successful projects. Delivering quality leadership throughout the project life cycle and matching rewards to the person and the team.

Applying the Leadership Services Model Shifting toward a service leadership approach: Setting standards, Building team identity, optimizing work, communicating clearly and developing productive relationships and protecting the team, redefining the role of the project leader, moving toward the team as customer, Changing your priorities and perceptions.

Building your best practice leadership toolkit: Creating a customized project leadership framework and generating a personal action plan, defining the team development framework, the start-up actions of effective leadership, documenting objectives and constraints in a team charter, Structuring team responsibility, fostering a team state of mind, the power of common Purpose of Course and what project leaders really manage.

Enhancing productive teamwork: building team collaboration skills, establishing team-owned ground rules, planning for a Team-Driven Project, unleashing the power of participation, organizing effective work design, Encouraging team responsibility, Managing people proactively, Implementing a participative approach to key planning tasks, kick-off meeting, project milestones, re-sourcing and complementing team expertise.

Mode of Delivery:

1. Lectures
2. Group discussions
3. Role plays
4. Experiential learning

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Quizzes
2. Seminar paper and presentation
3. CAT
4. Final examination

Core Reading Materials for the Course:

1. Jaworski, J. and Flowers, B. S. (1998). *Synchronicity: The Inner Path of Leadership 1*. Barrette-Koehler Publishers.
2. Kevin, C. (2008). *Leadership from the Inside Out: Becoming a Leader for Life.* Barrette-Koehler Publishers, 2nd Edition.
3. Larry C. S., and, Michele, L. (2002). *Focus On leadership: Servant-Leadership for the Twenty-First Century*. New York: John Wiley & Sons Publishers.

Recommended Reference Materials:

1. John, W. G. (1993).*On Leadership*. Free Press.
2. James M. K. and Barry, Z. P. (2007). *The Leadership Challenge*, Fourth Edition. Jossey-Bass.
3. Peter F. D. (2008).*Management Revised* Edition. Collins.
4. John P. K. (1999). *John P. Kotter on What Leaders Really Do*. Harvard Business School Press.

Title of Course: NUT 437: Food and Nutrition Policy and Planning- 45 Contact Hours

Purpose of Course:

This course aims to provide an understanding of the relation between global modernization and processes of the exclusion of people, places and societies. The course pays special attention to the role that sociologists can play in analyzing and addressing these relations.

Expected Learning Outcomes:

1. Assess and review food and nutrition plans and policies;
2. Develop effective and sustainable food and nutrition plans and policies
3. Promote implementation of inter-sectoral food and nutrition programmes at national or local level.

Course Content:

The course sets out to discuss critically the concepts of modernity and modernization by focusing on what the sociologist Zygmunt Bauman calls the production of 'human waste' or 'wasted lives': the 'superfluous' populations of migrants, refugees and other outcasts. Bauman sees redundancy and waste as inevitable outcomes of modernization related to its rational with the never ending quest for (re)ordering and economic progress as coinciding drivers (rationalization).

As long as large parts of the world remained wholly or partly unaffected by modernization, they were related by modernizing societies as lands that were able to absorb the excess of population in the 'developed countries'. Global solutions were sought to, and temporarily found, to locally produced overpopulation problems. But as modernization has finally reached the furthest lands of the planet, 'redundant populations' are produced everywhere and all localities have to bear the consequences of modernity's global triumph, i.e. redundancy and waste and a world wide exclusion of categories of people from progress. This urges for new solutions, what in turns appears to be the need to find – in vain, it seems – local solutions to globally produced problems. The global spread of modernity has given rise to growing quantities of human beings, or sometimes even complete regions, which are deprived of adequate means of survival, but the planet is running out of places to put them. This leads to destabilization and undermines the very logic of modernization. Furthermore in highly modernized and so far thus privileged (mainly western) parts of the world new anxieties arise around 'refugees', 'economic immigrants' and 'asylum seekers' and 'security fears' dominate the contemporary political agenda.

Mode of Delivery:

1. Lectures
2. Group Discussions
3. Case Studies
4. Work-based assignment

Instructional Materials:

1. Overhead projector
2. LCD power-point presentation

Course Assessment:

1. Assignments
2. Seminar Paper And Presentation
3. Continuous Assessment Test
4. Final Examination

Core Reading Materials for the Course:

1. Beatley, T. (1999). *Green Urbanism: Learning from Europe*. Washington D.C.: Island Press.

2. Buruma, I. (2006). *Murder in Amsterdam. New York*: Penguin Press.
3. Deben, L. and Heinememememjier, L. (2001).*Understanding Amsterdam: Essays*. Willem.

Recommended Reference Materials:

1. Willem, S. and Sako, M. *Amsterdam Human Capital*
2. Barrie, N. *One Hundred Years of Public Land Leasing in the Netherlands*
3. Steven, B. and Yu-Hung, H., *Leasing Public Land: Policy Debates and International Experiences edited by Cambridge,* MA Lincoln Land Institute
4. Gilderbloom, J. and Appelbaum, R. (1988). *European Housing in the Post-War Period: Some Lessons for the U.S from Rethinking Rental Housing*. Philadelphia, PA: Temple University Press.