

BACHELOR OF EDUCATION (ARTS) WITH IT

1.0 INTRODUCTION

The degree programme of Bachelor of Education (Arts) With IT is developed in line with the requirements of the country's secondary education system and the international standards on graduate teacher training curriculum. The programme seeks to produce graduate teachers who will have the requisite knowledge, skills and values relevant to not only be competent in the skills of delivery, but also be specialized in their areas of interest, ability and aspirations. In addition to Foundation Courses in Education, students will be expected to choose two other teaching subjects in the arts domain as prescribed in the secondary school curriculum

2.0 PROGRAMME AIM AND OBJECTIVES

The Bachelor of Education (ARTS) With IT degree programme is designed to produce graduate teachers well equipped with the requisite competencies and values of teaching specific subject areas as prescribed in the secondary education curriculum in Kenya. Specifically, the programme is planned in order to accomplish the following objectives:

- a) to prepare the student for an active career in all aspects of the profession of education
- b) to provide a comprehensive training background necessary for the students to become competent experts in the profession of education
- c) to enable the student identify the varied intellectual and special needs of the learner
- d) to develop the intellectual, professional and social characteristics that will enable the student to become responsible leaders in their schools and the community
- e) to develop the scientific character and capabilities of dealing with issues and problems in education and society
- f) to provide the students a rich basis for interest in further training and education in their areas of expertise, ability and interest

3.0 ADMISSION REQUIREMENTS

To be admitted to the programme, candidates must;

Satisfy the University entry requirements i.e. a minimum mean grade of C+

Or

Satisfy the University entry requirements i.e. a minimum mean grade of C+ and C+ in any two teaching Arts subjects

Have two Principal Passes at KACE/EAACE

Or

Have a Diploma in Education from a recognized educational institution

4.0 COURSE STRUCTURE AND DURATION

- 4.1 The degree shall normally take four academic years of 8 semesters.
- 4.2 Courses shall be offered in units. A course unit is defined as that part of a subject described by a coherent syllabus and taught normally over a period of a semester. It is designated as a total of 42 hours of study in a semester. For this purpose one 1-hour lecture is equivalent to one 2-hour tutorial or 3-hour practical or any combination as may be approved by the Board of the School of Education.
- 4.3 Part-time students shall be allowed to take not less than 50% of the courses prescribed for the year.
- 4.4 All courses will be taught for a total of 42 contact hours, including examinations except Teaching Practice which will be undertaken for the durations when schools are in session.
- 4.5 Students shall be required to undertake teaching practice of a whole school term of 3 months at the end of 3rd year of study.

5.0 EXEMPTION FROM COURSES

Students may be exempted from some courses by Senate on recommendation of the School Board.

6.0 EXAMINATIONS REGULATIONS

University senate Examinations rules and regulations shall apply.

7.0 COURSE DISTRIBUTIONS

7.1 BACHELOR OF ARTS (EDUCATION) WITH IT

FIRST YEAR, FIRST SEMESTER

UNITS

SCS 101	Introduction to Computers	3
SCS 114	Introduction to Spreadsheets and Databases	3
EDU 101	Introduction to Special Education	3
PSY 110	Introduction to Educational Psychology	3
	Two courses for each of the two teaching subjects	12*
	TOTAL:	24

FIRST YEAR, SECOND SEMESTER

UNITS

SCS 103	Programming in Pascal	3
SCS 112	Desktop Publishing	3
EMA 111	Environmental Education	3
EDF 111	History of Education	3
	Two courses for each of the two teaching subjects	12
	TOTAL:	24

SECOND YEAR, FIRST SEMESTER

UNITS

SCS 203	Information Systems Analysis and Design	3
SCS 207	Web Design and Publishing	3
ECT 210	General Methods of Teaching	3
EDF 210	Philosophy of Education	3
	Two courses for each of the two teaching subjects	12
	TOTAL:	24

SECOND YEAR, SECOND SEMESTER

UNITS

SCS 212	Database Systems	3
SCS 214	Management of Information Systems	3
ECT 211	Educational Media and Resources	3
ECT 212	Curriculum Development	3
	Two courses for each of the two teaching subjects	12
	TOTAL:	24

*See the list of courses in section 8.2

<u>THIRD YEAR, FIRST SEMESTER</u>			<u>UNITS</u>
SCS 306	Internet Computing		3
SCS 310	Multimedia and Graphics		3
PSY 310	Human Growth and Development		3
	Special Methods in two teaching subjects		6
	Two courses for each of the two teaching subjects		12
		TOTAL:	27
<u>THIRD YEAR, SECOND SEMESTER</u>			<u>UNITS</u>
SCS 322	Electronic Commerce		3
SCS 324	Statistical Analysis with SPSS		3
ECT 360	Educational Technology		3
PSY 311	Human Behaviour and Learning		3
	Two courses for each of the two teaching subjects		12
		TOTAL:	23
<u>FOURTH YEAR, FIRST SEMESTER</u>			<u>UNITS</u>
SCS 409	IT and Society		3
SCS 436	Internal Controls and Security Issues	3	
EMA 411	Educational Administration and Management		3
EDF 410	Sociology and Education and Comparative Education		3
PSY 410	Educational Tests and Measurement		2
	Two courses for each of the two teaching subjects		12
		TOTAL:	24
<u>FOURTH YEAR, SECOND SEMESTER</u>			<u>UNITS</u>
SCS 416	Human Computer Interaction	3	
SCS 427	Social and Professional Issues in Computing	3	
EMA 412	Planning and Economics of Education		3
EDF 390*	Teaching Practice		6
PSY 411	Guidance and Counseling		2
	Two courses for each of the two teaching subjects		12
		TOTAL:	23

- * Teaching Practice will be offered after completion of fourth year second semester courses. Therefore its not part of the load in fourth year second semester.

COURSE DESCRIPTIONS

A. COMMON COURSES

FIRST YEAR, FIRST SEMESTER COURSES

EDU 110: Introduction to Special Needs Education

Definition of Education and Special Needs Education; historical development of Special Education; Special and Regular Education; categorization of education, special education and society, sociology of special education and characteristics of various exceptionalities; causes and prevalence of handicapping conditions on each exceptional case.

SCS 101: Introduction to Computer

Historical background of computers, components of a computer system, basic computer organization, computer soft ware, operating systems with hands on experience with the operating systems currently in use as the University, Hands on experience with typical word processors.

SCS 114: Introduction to Spreadsheets and Databases

Database Types: Advantages and disadvantages; filed types creating and modifying fields in database. Data entry and validation checks. Importing and exporting tables. Data handling: Add, view edit, sort or filter data in a database creating using view files. SQL and query files; creating, saving, modifying query files. Forms: creation and application. Data entry and viewing through forms: Form within a form. Report: Crating, customizing and printing of reports and mailing labels (mailing lists). Designing and Running of MaCros.

PSY 110: Introduction to Educational Psychology

Introduction; Personality theories; personality development; Personality assessment; Biological foundations of human behavior: The nervous system, the learning process, sensation, perception, consciousness, attention and interest, emotion and aggression, frustration, conflict, anxiety, stress

and stress management, memory and forgetting; Types of exceptionalities: Learning disabled, minimal brain damage, social-emotional problems, mentally challenged, gifted and talented, sensory handicap, multiply handicapped.

FIRST YEAR, SECOND SEMESTER COURSES

EDF 111: History of Education

Development of education throughout history; Education in classical times; Education during the middle ages; The emergence of states in the 17th and 18th centuries and its influence upon the development of education; Education in the 19th and 20th centuries with historical study of the ideas of selected important educational thinkers; History of education in Kenya: patterns, problems and developments from the pre-colonial times to the present.

SCS 103: Programming in Pascal

Notations and fundamental concepts, data type and declaration, statement, expression and assignments, simple input and output, basic control structures, procedures and function, arrays, records, sets, files, pointers:- pointer concept, programming a stock, non linear structures, storage tailoring (3 credit hours).

SCS 112: Desktop Publishing

Basic concepts of desktop Publishing Packages. Crating and Publications; The toolbox, working with pallets and setting preferences: Formatting texts: Working with graphs and managing windows; Constructing a publication and using the dictionary: Indexing; creating tables of contents. Colour management Systems.

EMA 111: Environmental Education

Environmental Education perspectives. The earth – its environmental systems and resources. Environmental management, Demography and the environment; Human settlements. Society, culture and environmental awareness. Technology and environment; Development and environment; Legal aspects of environment; Chemicals and environment; the teaching of environmental Education in the 8.4.4 education system.

SECOND YEAR, FIRST SEMESTER COURSES

ECT 210: General Methods of Teaching

The nature of teaching and learning; a systems' approach to teaching; teaching methods and strategies; educational aims, goals and objectives; planning for instruction; communication and interaction in the classroom; providing for individual differences; motivation and sustenance of learners' attention and evaluation of learning outcomes.

EDF 210: Philosophy of Education

An introduction to philosophy as a discipline of knowledge: the origin, purpose and development of educational philosophy of education as a distinct discipline of knowledge; The content of education; Education and knowledge, education and values; The method of education; The creative and social dimensions of education; The concept of teaching and learning; The teaching of social education and ethics.

SCS 203: Information Systems Analysis and Design

Conducting feasibility studies, selecting the team, terms of reference. Technical, cost sizing of equipment and man power, operational feasibility, Implicating for people on organization, participative systems design, management of innovation, Economic feasibility cost/benefit and capital investment analysis, estimation of cost, economics of information, valuation of benefits, the feasibility report.

SCS 207: Web Design and Publishing

Internet and the world web (WWW) Browsing and searching techniques; the Internet as a research tool. Search engines; Introduction to Hypertext Mark Up language (HTTP); Web design, hosting and development; Intranet concept: evolution, benefits and challenges.

SECOND YEAR, SECOND SEMESTER COURSES

ECT 211: Educational Media and Resources

Communication Models and Learning; barriers to effective communication and how to overcome them; visual communication in learning; verbal and non-verbal communication; introduction to the range of media in teaching and learning; using educational radio and television broadcasts in

schools; producing teaching and learning materials in schools; selection and use of print media; management of school multi-media center; evaluation of educational media; future developments in educational media and resources.

ECT 212: Curriculum Development

Definitions and concepts; the meaning of educational goals and purposes of education; curriculum as a field of study and as a programme of instruction; curriculum development process; models of curriculum development; patterns of curriculum organization, stages of curriculum development; principles of curriculum implementation; the process of curriculum implementation; curriculum evaluation; the teacher and the curriculum; curriculum development in Kenya; issues in curriculum development in Kenya; Relevance, strategies and processes; issues in teacher education and teaching profession: universal primary education.

SCS 212: Database Systems

Database systems; Data modeling an relational model; Database query languages; Relational database design; transaction processing: Distributed database; physical data base design.

SCS 214: Management Information Systems

Introduction to management information systems hardware and soft ware issues, application software packages, database management systems, ethical and security issues, systems analysis and design.

THIRD YEAR, FIEST SEMESTER COURSES

ECT 311: Special Methods of Teaching Mathematics

Introduction to Mathematics Education; philosophy and foundations of mathematics education; general goals and objectives of mathematics; instructional theories of teaching and learning mathematics; strategies of teaching mathematics, secondary school mathematics curriculum in Kenya; planning for instruction; instructional resources; teaching selected topics and problem solving procedures; trends and issues in teaching mathematics; assessment in mathematics.

ECT 312: Special Methods of Teaching History

The place of History in the curriculum; aims and objectives; secondary school history syllabus; teaching and learning strategies in history preparation of scheme of work lesson plan and record of work covered; preparation, selection and use of resource materials; evaluation in history; trends in the teaching of History in Kenya.

ECT 313: Special Methods of Teaching Geography

Goals of Education and contribution of Geography as a subject to their achievement; trends in geography teaching; the nature and scope of geography in the 8-4-4 secondary school curriculum; the Kenya secondary Geography syllabus; scheme of work, lesson plan and record of work covered in Geography; use of media in Geography teaching and learning; programmed learning in Geography; the K.I.E. radio broadcasts and recorded Geography lessons; informal methods of teaching Geography: site visits, field visits, projects, resource persons; creating the Geography atmosphere in the school; making simple apparatus for Geography lessons; using the local environment and fieldwork in Geography; evaluation in geography.

ECT 314: Special Methods of Teaching English

Development of language skills necessary for the teaching of English as a second language; the recognition and identification of various purposes for which English is used; aims and objectives; secondary school syllabus in English; teaching and learning strategies, preparations of scheme of work, lesson plan and record of work covered; production, selection and use of resource materials; print media, audio/visual media, the language, laboratory; evaluation; current issues and problems in the teaching of English language in Kenya.

ECT 315: Special Methods of Teaching Literature in English

Definition and functions of literature; aims and objectives of teaching Literature in English; the relationship between English language and Literature in English in the secondary school curriculum; the Kenya secondary school Literature syllabus; current issues in the teaching of Literature in secondary schools; development of Literature appreciation; selection and use of literacy texts and material; teaching oral literature, poetry, plays, novels and short stories, scheme of work and lesson preparation; Testing and evaluation in Literature.

ECT 316: Mitindo Mahsusi ya Kufunza Lugha ya Kiswahili

- i. Kukuza ujuzi wa lugha wastani ya Kiswahili kwa kuahimiza walimu au wanafunzi umuhimu wa;
 - Kusilikiza
 - Kuongea (kuzungumza)
 - Kusoma
 - Kuandika
- ii. Uchunguzi wa lugha kama inavyotumiwa katika magazeti
- iii. Kurekebisha shida za matamshi kama ikiwezekana kwa kutimia maarifa na vifaa vya kisasa katika chumba cha lugha.
- iv. Kuchambua mfumo wa 8-4-4 wa elimu – shule za sekondari
- v. Kutayarisha muhtasari wa ratiba katika somo la Kiswahili; Taarifu ya somo ya kipindi chochote cha lugha ya Kiswahili.
- vi. Utahiri katika kufundisha lugha ya Kiswahili
- vii. Kuwaongoza wanafunzi kujifunza njia mbali mbali za kufundisha fasihi ya Kiswahili.
- viii. Kuhariri na kuzidisha ujuzi wowote unaohusu lugha sarafi na uandishi wa insha ya Kiswahili lulingana na kazi mbali mbali.

ECT 317: Special Methods of Teaching Economics

The nature of Economics Education; aims and objectives; the secondary schools Economics syllabus; strategies in the teaching and learning of Economics; preparation of the scheme of work, lesson plan and record of work covered; preparation, selection and use of resource materials; models, graphics, print media, audio visual media, realia etc; the role of Mathematics in the teaching of economics; assessment and evaluation in Economics teaching. Trends in the teaching of Economics in Kenya.

ECT 318: Special Methods of Teaching Religious Education

The nature of Religious Education; attitudes to religious education; the legal aspects of religious education in Kenya: the Kenya constitution, the Ominde report (1964), and the education act (1968); aims and objectives; the nature and the scope of Religious Education in the secondary school curriculum; the syllabus in the teaching of Religious Education; strategies in the teaching

and learning of Religious Education, preparation of the scheme of work, lesson plan and record of work covered; production, selection and uses of resource materials; realia, graphics, print media and audio visual media, resource persons; evaluation.

ECT 319: Special Methods of Teaching Home Science

Introduction to the teaching of Home Science; development of curriculum concepts and theories; scope and sequence in Home Science; aims and objectives; secondary Home Science syllabus; strategies in the teaching and learning of Home Science; preparation of the schemes of work; lesson plan and record of work covered; production selection and use of resource materials; realia, models, graphics, audio visuals, educational broadcasting; management of the home science room; evaluation; trends in the teaching of Home Science in Kenya.

ECT 320: Special Methods of Teaching French

Language skills necessary for teaching French as a foreign language; the teaching of phonetics, phonology, morphology and syntax; strategies in the teaching and learning of French; grammar problems; remedial oral French; aims and objectives; secondary school syllabus in French; preparation of schemes of work, lesson plan and record of work covered; resource materials; print media, audio visual media, the language laboratory; evaluation, trends in the teaching of French in Kenya.

ECT 321: Special Methods of Teaching Music

Foundations of Music learning; social and psychological aspects involved in teaching of Music concepts and skills; aims and objectives; the secondary school Music syllabus; strategies in the teaching and learning of Music; preparation of the schemes of work, lesson plan and record of work covered; preparation, selection and use of resource materials; evaluation, organizing the topic programmes in schools; trends in the teaching of Music in Kenya.

ECT 322: Special Methods of Teaching Hearing Impaired

Teaching language and reading to the hearing impaired; techniques of individual speech training, articulation; voice and fluency; adapting school curriculum to teach non-language subjects; use

of total communication; integration of communication techniques in teaching; non-language subjects; Kenya sign language; signing exact English, finger spelling.

ECT 323: Special Methods of Teaching Business Studies

Meaning and definition of Business Education; historical development; and present status of Business Education; goals of Business Education; Business Education in the Kenya secondary school curriculum; Business Education syllabus, scheme of work, lesson plan, and record of work covered; teaching strategies and techniques in Business Studies; motivation and sustenance of learner interest; teaching and learning resources in Business Education; evaluation in Business Education.

ECT 324: Special Methods of Teaching Mentally Handicapped

Methods related to specific subjects; language and motor; multi sensory approaches to learning music therapy; art therapy; modification of academic curriculum; adaptation of theory and teaching aids; implementation of individualized education programmes; assessment; planning teaching and evaluation.

ECT 325: Special Methods of Teaching Physically Handicapped

The course covers the learning and motivation theories, their application to classroom organization and management and remedial teaching techniques.

ECT 331: Special Methods of Teaching Visually Handicapped

Adaptations of the 8-4-4 curriculum, Mathematics Adaptations, Maps to teach pupils Vegetation relief, Methods of teaching science and agriculture, models, how to teach Braille to the adventiously blind.

ECT 334: Special Methods of Teaching Computer

Introduction to Computer Education; Philosophy of Computer education; aim and objectives of the secondary school Computer Studies syllabus; strategies in the teaching and learning of Computer Studies; preparation, selection and use resource materials; secondary school Computer

Studies curriculum in Kenya; teaching records, scheme of work and lesson plan; current issues in Computer Studies; IT appreciation; management of a computer laboratory; evaluation.

PSY 310: Human Growth and Development

Introduction: Historical overview, Theories about the child, methods of studying children; Pre-natal period: Genetic counseling and phenotype, prenatal growth and development, nature/nurture concept; The birth process: Labour, delivery, dangers; Infancy; Early childhood; Mid childhood; Late childhood; Adolescence; Moral development Adulthood.

SCS 306: Internet Computing

History and evaluation of the Internet, basic tools of Internet access, emails, ftp, Telnet, news, anarchie, WWW Basic Internet Protocols, TCP/IP, SMTP, ftp, http, routers, algorithms and protocols for routing, Internet programming, Unix systems calls, socket programming, languages for the Internet, HTML, XML, Java scripts, perl, applications, network information discovery and retrieval, web servers, robots and search engines, security issues, firewalls, encryption and protocols problems with the Internet, technical issues. Future of the internet, NGI, Internet-II, IP 6 etc.

SCS 310: Multimedia Graphics

Fundamentals of design and Visualization; Creating illustrations: Image creation: Creating Editing and optimizing graphics for commercial design; 2 Dimensional animations, 3D graphics Multi media.

THIRD YEAR, SECOND SEMESTER

ECT 360: Educational Technology

This unit is divided into two parts, both of which are practical activities for the students in teaching and production of resource materials; The first part covers Educational media practicals: (How to use the chalkboard, graphics, construction of three-dimensional materials, operation of audio-visual equipment, preparation of audio programmes) and the second part covers Microteaching; (Lesson preparation, preparation of audio visual media for the lesson; lesson presentation; skills application set induction, lecturing, reinforcement, stimulus variation, questioning, providing for learner participation, feed back, closure).

ECT 390: Teaching Practice

This is a practical course for students of education. It provides opportunity for the students to practice teaching principles in a real classroom and school environment. Each student is attached for a period of three months to a secondary school and relevant institute of technology or national polytechnic where they work under the guidance and co-operating teacher and the university supervisor. During this period of attachment to the education institution each student is inducted in the teaching profession and guided and graded in two teaching subjects.

PSY 311: Human Behaviour and Learning

Definition; Determinants of human behavior; Origin of group membership Group pressure; Power and influence; Group performance; Group norms and cohesiveness; Attitudes and stereotypes; Motivation; Roles and conflicts in groups; Theories of learning; Learning process; Conditions of learning; Factors affecting learning.

SCS 322: Electronic Commerce

E-commerce, benefits and shortcomings, business to business commerce, business to consumer commerce. Building blocks of electronic commerce. Applications internet and Network protocols. Electronic payment systems. Security transactions. Review of cryptographic tools, secure financial transactions. Payment transactions and standards, Smart card and e-cash technologies. Authentication, signatures, observers, Anonymity, privacy, trace ability. Key certification, Management and Escrow, technologies for building e-commerce applications,

distributed objects, object quest brokers, and object oriented application frameworks. Some applications: supply chain management, Internet auctions and remote banking.

SCS 324: Statistical Analysis with SPSS

Introduction; File management; File systems, creating new files, opening saved files, saving files, Printing, editing: cut and paste, copy and paste, editing options: Data manipulation: Variable definition, inserting variables, inserting cases, variable transformation; Statistics: summarize, custom tables, comparing means, general linear model, correlation and regression, data reduction, reliability analysis, non-parametric tests. Graphs, Bar charts, line graphs, pie chart, box plots, error bars, scatter plots, histograms, p-p plot, time series.

FOURTH YEAR, FIRST SEMESTER COURSES

EDF 410: Sociology of Education and Comparative Education

Origins of Evolution of sociology and sociology of Education; Sociology as a discipline of knowledge, its branches and methods of study, the relationship between sociology and other Social Sciences; sociological theories and their relevance to Education; Education and the Socialization process; Education and Culture; Social stratification and Education; Education opportunity and Equality; Education and Politics; Education and Gender development; Education and development; Education deviance and transformation; Sociological research in Education settings; Comparative Education as a discipline encompassing the definition; purpose; significance; historical development and methodological approaches used; Comparative study of systems of education in Britain; France; Israel; South Africa; Cameroon and East African countries; Contemporary issues in education such as urbanization, higher education, technical education; teacher education; special education; science education; inspection and supervisory practices; multilingualism; dependence and interdependence in education.

EMA 411: Educational Administration and Management

Introduction to Educational Administration: definition of administration, management, educational application of administration and management; Theories of administration: scientific management including bureaucracy, human relations, behavioral approach, systems approach; legal basis of education in Kenya: party manifestos, the construction, the Education Acts and

subsequent legal notices, presidential Pronouncements; School organizations: registration categorization, management, roles of Board of Committees; Instructional management; Co-ordination of curricular activities; Selection and acquisition of instructional materials and equipment; Maintenance of school financial management: principles of book-keeping, accounting journals, sales, purchases, cash receipts and payments, ledgers inventories, petty cash and bank reconciliation, sources of school funds, estimates and budgets, spending and accounting for school finances – authority to spend legal guideline – school accounts, auditing; Teachers' Association.

SCS 409: IT and Society

History of computing, social context of computing, methods and tools of analysis, professional and ethical responsibilities, the electronic community, the changing nature of technological risks, the information economy, risks and liabilities of safety-critical systems, intellectual property, privacy and civil liberties, pornography and censorship, social implications of the internet, computer crime, economic issues in computing, philosophical foundations of ethics.

PSY 410: Educational Tests & Measurement

Introduction; Educational objectives; Types of tests; Test construction; Test specification; Item analysis; Reliability and validity; scaling; Test administration; scoring and interpretation; Introduction; Organization of data; Graphs: Measures of central tendency; Measures of dispersion; standard scores; Area under the normal curve; correlation and regression.

SCS 436: Internal Controls and Security Issues

Controls on data and information: Input controls, Processing controls, output controls : Internal Security: Protection against fraud: computer crimes, computer viruses: Security measures: Information systems audit.

FOURTH YEAR, SECOND SEMESTER COURSES

SCS 416: Human-Computer Interaction (HCL)

The Principles of HCL, modeling user, interaction, window management system design, help systems, evaluation techniques, and computer supported collaborative work.

SCS 427: Social and Professional Issues in Computing

History of computing, social context of computing, methods and tools of analysis, professional and ethical responsibilities, risks and liabilities of safety-critical systems, intellectual property, privacy and civil liberties, social implications of the internet, computer crime, economic issues in computing philosophical foundations of ethics.

EMA 412: Planning and Economics of Education

Educational Planning; History and rationale of Educational planning; Social and psychological factors in educational planning; General problems of educational planning in and outside Kenya; Methodologies of educational planning. Planning for changes in the educational system; Administrative factors and educational planning; Economics of education; Leading economic issues of basic concern and their relevance to Kenya; Principles of economics of education and planning: micro-economics of education, macro-economics of education and socio-economic development.

PSY 411: Guidance and Counseling

Definition: Origin and philosophy; Theories; Skills and techniques; processes; Areas and challenges; Characteristics; Counseling models; Ethical standards; Counseling exceptional populations; current issues; Guidance programmes and services; Functions of Counseling.

B. TEACHING SUBJECTS

HISTORY AND GOVERNMENT

FIRST YEAR, FIRST SEMESTER

AHI 101: African History to 1885

Introducing Africa and its history; beginning of food production, growth and spread of global networks of commerce; Africans and technological innovation; religion in African history; Afrasam civilization in Ethiopia, the Horn of Africa, Egypt and North Africa; Nilo-Saharan peoples and cultures and the emergence of the Sudanic Civilization; Niger-Congo civilization in West Africa; domestication of yam and the pioneering of fishing, weaving and wood sculpture technologies; Khoisan civilization in Ethiopia, Zambezi region and South African; Sahara-Sahelian peoples and the beginnings of crop cultivation; aquatic tradition of Sudan; Sudanic civilization; Bantu peoples in equatorial rainforest; cultivation and herding in Eastern Africa; Nubia and Egypt; early Eastern African Bantu and their neighbours; commerce, merchants and states in Northeastern Africa; Egypt and the commercial revolution; rise of the Napata Kingdom, Meroe, Aksum and the commercial revolution in the Horn of Africa; North Africa in the Carthaginian and Roman eras; development of commerce in West Africa; Jenne as an early urban center; trade and subsistence farming in Southern Africa; Indian Ocean trade; the Swahili factor; Great Zimbabwe and the Indian Ocean trade; growth of political scale in Central Africa: the Upemba kingdom and its neighbours, the Tyo Kongo kingdoms; Eastern African: spread of Bantu agricultural populations, new political institutions, expansion of Nilotic peoples; Northeastern Africa: Ethiopian highlands, feudalism and Christianity; founding of the Solomonic dynasty; religion in the political relations of the Solomonic era; camels and the development of pastoral nomadism; religion, commerce and social reorganization in the Horn; the early age of the empire in Western Sudan: Wagadu, Gao, Kanem, Hausa city states; commerce and Islam in the Western and central Sudan; Yoruba states; Mali Empire; the Muslim conquest of North Africa and after; Africa's introduction to the slave trade; Africa and the world from 1450; end of the age of Empire in the Western Sudan; age of kingdoms in the Western Sudan; Atlantic commerce and the coastal hinterlands of Africa; Kingdom of Kongo and its neighbours; Zimbabwe: the Mutapa and Torwa kingdoms; Malawi empire and its kingdoms; seagoing commerce in Southern Africa; seagoing trade and the Swahili; Borno in the history of the Chad

basin; cattle keeping, farming and political history in the Great lakes region; Lunda and Luba empires; Africa in the era of the Atlantic slave trade; Southern Africa: new pastoral and trading frontiers; trade and political change in the East African interior; North Africa: the decline of Ottoman over-rule.

AHI 102: History of Europe since 1900

Disintegration of Ottoman and Austro-Hungarian Empires; First World War, peacemaking; Bolshevik revolution in Russia; emergence of USSR, Fascism and Nazism in Europe; Second World War; post war period, sovietization of Eastern Europe; partition of Germany; emergence and development of European Economic Union/community; disintegration of the Soviet bloc; reunification of Germany; Europe and Africa.

DPS 101: Basic Concepts in Political Science

The definition of politics, its nature and scope; the dynamics of political activity; human and government activities that constitute the study of Political Science; Political Science as a social science discipline; the nature, processes and ends of the modern state, types of political systems; an examination of political institutions and processes: political parties, pressure and interest groups, the three arms of government, analysis of key concepts in political science: the state, power, authority, bureaucracy, sovereignty, legitimacy, justice, liberty.

FIRST YEAR, SECOND SEMESTER

AHI 103: African History since 1885

African attitudes and preparedness on the eve of colonialism; reasons for the partition, conquest and occupation of Africa by European imperial powers; African initiatives and reaction in the face of the conquest and occupation; the survival of Liberia and Ethiopia; African and World War I; political mechanisms devised for the administration of the colonies and the ideologies behind them; the classic era of colonialism; (1919 – 1935): economic and social aspects of the colonial system and their impact on Africa; African initiatives and reactions in the face of the consolidation of colonialism and the exploitation of their continent: petitions and delegations to metropolitan and local governments, strikes, boycotts, the press, and international congresses; fascist Italian invasion of Ethiopia in 1935 and the beginning of decolonization in Africa;

Africa in a decade of world conflicts (1935 – 1945): the Ethiopian War and its sequences, North Africa and the Horn as combat zones in the Second World War, fascist tendencies in Europe and their impact on French, Spanish and Portuguese empires in Africa, the impact of the Second World War on British and Belgian-dominated Africa; the struggle for political sovereignty from 1945 to independence, underdevelopment and the struggle for economic independence, socio-political change since independence: nation-building and changing political structures and values, religion and social evolution, language, literature and social change, the arts and society, philosophy and science: pan Africanism and regional integration; independent Africa in world affairs, Africa and globalization.

AHI 104: African Historiography

Definition and development of African historiography, development of African historical writings; African's contribution to world history, dominant features of African history, idea of two Africas, colonial historiography, Nationalist historiography, African diaspora and African historiography, methods in the study of African history, contemporary historiography, challenges in the writing of African historiography.

DPS 103: Politics and Government in Africa

Survey of the political and governmental processes and institutions in Africa since the pre-colonial period: traditional African Political systems; colonial penetration and conquest of Africa, the colonial socio-economic and political policies, African nationalism and the decolonization process, the nature of African post-colonial states, political party systems, the bureaucracy, the military in the political process, class and ethnicity, Aid and Dependency, Regional Integration, and organization of African Unity.

SECOND YEAR, FIRST SEMESTER

AHI 201: History of Kenya to 1895

Early humans, technological changes during the stone age and the emergency of hunter-gatherer communities, the iron age and the emergence of modern communities, production and exchange patterns, evolution of social and political systems, aspects of inter-ethnics relations, the growth of Coastal communities and urbanization, regional and long distance trade, slavery, slave trade and international contacts, the coming of European explorers and missionaries, European rivalries and the establishment of the Imperial British East Africa Company.

AHI 202: African Economic History

Approaches and theoretical issues in the study of African economic history, pre-colonial modes of production, hunting and gathering, agriculture, pastoralism, mining and metallurgy, labour organization, pre-colonial trade, imperialism and partition, colonial economy, capitalism and the emergence of settler and peasant production, trade and marketing, industrialization, proletarianization and peasantization, labour issues, trade and the emergence of continental and regional economic blocs, Africa in the World economy, debt crisis, globalization and current trends in African economy.

DPS 201: Introduction to Political Economy

Theoretical perspectives of classical political economists: the mercantilist, physiocrats and utilitarians; contributions of Adam Smith, David Ricardo, T. R. Malthus, and J. S. Mill, Marx's critique of classical political economy, analysis of the process of production in market economies, the role of the state in economic development, reflections on the politics of planning in the capitalist, socialist and Third World countries especially with regard to some neo-classical (Keynesian) theories, the relevance of political economy to contemporary development problems.

SECOND YEAR, SECOND SEMESTER

AHI 203: History of Kenya since 1895

British conquest and colonization; African responses to the imposition of colonial rule, the building of the Uganda Railway and the emergence of the Asiatic factor, colonial administration and political change, settler politics and colonial economy, missionary activities and social change, colonial education, European, Asian and African politics to 1945, the impact of 1st and 2nd World Wars, nationalism and decolonization since 1945, challenges of nationhood, economic, cultural and political dependency, Kenya in world affairs.

AHI 206: African and the Black Diaspora

Conceptual issues in Black diaspora studies, geographical dimensions of the study, slave trade and the historic dispersal of Africans in Europe, Asia, the Caribbeans and the Americas, comparative study of slavery, resistance and rebellions, the abolition movements, issues of African consciousness in the diaspora, Black leaders in the African diaspora, Pan African movement, the Civil rights movement in the U.S.A, the anti-colonial struggle and the impact of Africans in diaspora, relations between Africa and the African diaspora in time perspective.

DPS 203: Introduction to Public Administration

The nature and scope administration, development of public administration as a discipline, approaches to the study of public administration, scientific management , bureaucracy, principles of administration, and human relations movement, the organization of public administration in a government, public administration and branches of government, public policy formulation and implementation, the public budget, purposes and processes, human resource management, public employees' organizations and industrial relations.

THIRD YEAR, FIRST SEMESTER

AHI 301: Research Methodology in History

Meaning, nature and scope of history, development of history as a discipline, nature and importance of research, history as research oriented discipline, problems and purpose of historical research, identification of historical research problems, nature and sources of historical evidence, verification and evaluation of the past, the place of theory in history, preparing research proposal, library and archival research, oral interviews, questionnaire, storing and analysis of historical evidence, presentation of research results, challenges in historical research.

AHI 304: History of the Horn of Africa

The Kingdom of Shoa, the Ethiopian Empire, social, political and religious developments in Somalia, Djibouti, Eritrea and Northern Kenya during the 19th century, imperialism, Menelik II and his political thought, Haile Selassie's expansionism and colonialism of Eritrea, Italian invasion of Ethiopia (1935), Somalia and Djibouti under colonial rule, the Horn in World War II, Nationalism and decolonization, Somali irredentism, post independence developments, the Ethiopian Marxist Revolution and its decline, Eritrea/Ethiopian conflict, Cold War and the Horn of Africa, the collapse of the state in Somalia and attempts towards its resurrection.

DPS 304: Politics of Industrialization and Agriculture in Africa

The relationship between agriculture and industrialization in Africa, the effects of agricultural innovation and industrialization on the political system, the effects of land tenure systems on agricultural production, financial, land and labour markets in the African countryside, issues of food production and hunger in Africa, the social, economic and political consequences of industrial growth in Africa, introduction of foreign technology, foreign trade and the industrialization process, the response and capacity of African states to handle these multifaceted changes.

THIRD YEAR, SECOND SEMESTER

AHI 305: History of East Africa since 1880

Religion and commerce, Imperialism, European conquest and African response, colonial administration system and its impact on political indigenous institutions, the growth and development of transport system, colonial economy and land tenure system, educational and social developments, decolonization processes and achievement of independence, single party/military regimes, economic reforms since independence, the making and unmaking of East African community, Inter-state relations since the collapse of E.A.C, Neo-colonialism, the revival of the East African Community.

AHI 306: History of Political Ideas

History of politics and the emergence of political ideas, Greco-Roman philosophy (plato, Aristotle, Socrates and Seneca), Christian philosophy (St. Augustine and St. Thoman Aquinas), Islamic philosophy (Ibn Khaldun), European philosophy (Machiavelli, Hobbes, Locke, Rousseau, Burke, J. S. Mill, de Tocqueville, Hegel, Lenin and Marx) Asian philosophy (Mao Tse-tung and Tagore), African Philosophy (John Mbiti, P. Hountondji, K. Wiredu, O. Oruka, V. Mudimbe, Nkrumah and Nyerere), Neo-Marxist theories, political thinkers of the contemporary world.

DPS 312: Rural Development Strategies in Kenya

Principles and theories of development administration, the structure of the rural sector in Kenya, analysis of strategies for rural development in Kenya, analysis of strategies for rural development in Kenya, agricultural and commercial development in rural development in Kenya, the role of various government agencies in rural development, the role of Non-governmental Organisations (NGOs) and “Harambee” self-help groups and movements, the idea of decentralization for rural development in Kenya: its theory and application.

FOURTH YEAR, FIRST SEMESTER

AHI 401: Philosophy of History

The nature and significance of the human past, philosophical theories, speculative philosophy, unilinear progression, cyclical, mechanistic, rationalist, positivist and deterministic, critical philosophy of history, nature of historical explanation, nature and function of normative in historical contexts, historical judgement, scope of historical inquiry.

AHI 405: Egypt and the Nile Valley

Geographic and ethnic background, Ancient Egypt, Egypt and her neighbours, Nubia, Kush, Nilotes, the Beja and Central Sudanic peoples, Egyptian religion, Judaism, Christianity and Islam, the Roman period, the Byzantine Egypt, Arab conquest, Faras, Kasridim, and Aksumite civilization, Nile Valley and World history, imperialism and its impact in the Nile Valley, the Nile Valley and Africa, the struggle over the Nile waters.

DPS 401: Politics and Government in Africa

A comparative analysis of politics and Government in the three East African States: Pre-colonial political systems, colonial penetration and conquest, colonial administration and socio-economic policies, African nationalism and the decolonization process, political system in the independent states, approaches to development, bureaucracy and development, militarization of politics, class and ethnicity, interest and pressure groups, diplomacy and foreign relations, regional integration.

FOURTH YEAR, SECOND SEMESTER

AHI 407: History of Southern Africa since 1800

The geographical and ethnic background; the Mfecane and the Boer trek; missionary factor and mineral revolution, Southern Africa on the eve of colonial rule, confrontational politics in Zulu, Ndebele Sotho-Tswana, Swazi and Lozi, the age of imperialism, the Boer expansion and hegemony, economic and social transformations, the rise of nationalism and decolonization processes in South Africa, Malawi, Zimbabwe, Angola, Zambia, Mozambique and Namibia, state and politics in the post colonial period, agrarianism, industrialization and labour politics, challenges to the new states in Southern Africa.

AHI 412: Protest, Rebellion and Power in East African History

African responses to colonial rule, African survivals, resisters, collaborators and the new chiefs, specific examples from Kenya, Mau Mau, Nandi, Nomiya, Dini ya Msambwa, Mumboism, Tanzania: Abushiri, Maji Maji, Hehe rebellions, Uganda: Kabarega, Kabaka Mwanga, the aftermath of post-colonial rule in Kenya, Uganda, Tanzania and Rwanda, organized protests and rebellions against colonial institutions and post colonial struggles for power in the region, Kenya: the Shifter war, 1982 attempted coup, pro-reform protests, ethnic protests and ethnic struggles for reform, Uganda: Idi Amin's regime, Museveni's regime and no party movement, Alice Lakwena's movement, Kony's Lord's resistance movement; Tanzania: the rise and fall of Nyerere's regime, and popular rebellion in Zanzibar, Rwanda genocide.

DPS 415: Politics and Government in Kenya

A study of the political processes and institutions in Kenya; a historical survey of the pre-colonial political systems, colonial penetration, conquest and administration, the rise of African nationalism, the role of political parties, pressure groups and social movements in the decolonization process, politics and government in independent Kenya, Political party systems, administration, class and ethnicity, approaches to economic development, the constitutional process, Kenya's foreign relations.

ECONOMICS

FIRST YEAR, FIRST SEMESTER

AEC 101: Introduction to Microeconomics

The scope of economics and nature of economics systems, methods of allocating economic resources; consumer behavior demand and supply, theory of production, and costs and markets and market structures: perfect competition, monopoly, monopsony and imperfect competition, the theory of distribution and pricing of factors of production.

AEC 103: Mathematics for Economists I

Role of mathematics in economic analysis, fundamental techniques in algebra, set theory, relations and geometry, differential calculus, concepts of limits, continuity, derivatives and extreme values, partial and total differentials, introduction to integral calculus, optimization:

optimum and extreme values, relative maxima/minima for simple and multivariate functions, optimization with subsidiary conditions, optimization over time, consumer choice under rationing.

FIRST YEAR, SECOND SEMESTER

AEC 102: Introduction to Macroeconomics

Basic concepts and scope of macroeconomic analysis, national income, concepts, measurement and as an index of social welfare, the Keynesian model of income determination, introduction to theories of consumption and investment, recession, inflation and population unemployment Taxation and fiscal and monetary policy.

AEC 104: Mathematics for Economists II

Linear and matrix algebra, review of calculus upto and including partial differentials of several variables and constrained optimization, Euler's Theorem, the adding up Theorem, partial elasticities, comparative static analysis, linear and non-linear mathematical programming, integration, the Reimann integrals, the fundamental law of calculus, the exponential law of growth, Domar's capital expansion model, pareto distribution theory: difference and differential equations, input output analysis, the input-output model, differentiation: differentiability of a function, rules of differential, differentiability of non-algebraic functions, the implicit function rule, order higher algebraic functions, the implicit function rule, higher-order derivatives introduction to statics.

SECOND YEAR, FIRST SEMESTER

AEC 201: Intermediate Microeconomics

Consumer demand theory, theories of consumer behaviour, cardinal utility theory, ordinal utility theory, revealed preference theory and consumer equilibrium, theory of the firm: production, costs and equilibrium analysis. Theory of Market structures: perfect and imperfect competition, partial equilibrium of comparative markets, and market equilibria, theory of general equilibrium, general competitive equilibrium in exchange and production economies, Pareto optimality, introduction to welfare economics.

AEC 202: Economics Statistics I

The nature of statistical analysis, classification and presentation of data, census and sampling, descriptive statistics, measures of central tendency and dispersion, Lorenz curves. Probability theory sets and events, objective and subjective approach to probability and Axioms of probability, probability distributions: the poisson distribution, the hyper-geometric and normal distributions, Index numbers, introduction to bivariate frequency distributions.

SECOND YEAR, SECOND SEMESTER

AEC 204: Agricultural Economics

Basic concepts and scope of agricultural economic analysis, special characteristics of agricultural production principles: concepts of production function, production and cost functions, farm records, tools of farm planning gross margin analysis, farm budgeting and programme planning, linear programming and its applications, farm production under conditions of risk and uncertainty, agricultural marketing basic concepts, functions of agricultural marketing systems, marketing channels used by farmers acting in unison in Kenya; Kenya's agricultural pricing policy; international commodity agreements and the African economies.

AEC 205: Intermediate Macroeconomics

Basic concepts and techniques in macroeconomic analysis. Relationship between macroeconomics and microeconomics, macroeconomics, models of income determination: Keynesian, classical and Montetariats. National income accounting, real output, price, index, Theories of consumption, saving and investment. Banking system, demand for and supply of money. Output, employment and inflation. Macroeconomic stabilisation policies. International trade and finance; balance of payments adjustment policies under fixed and flexible exchange rates. Introduction to growth theory.

THIRD YEAR, FIRST SEMESTER

AEC 304: Quantitative Methods I

Review of probability theory: conditional probability and independence of events; decision theory; game theory; linear programming; graphic solution, simplex method, the dual problem

and shadow prices, degeneracy; mixed constraint input-output model; dynamic input-output models.

AEC 313: Money and Banking

History and growth of banking in general and in East Africa; the role of central and commercial banks creation and supply of money and its determinations, financial intermediaries; modern quantity theory and demand for money; the role of money in an exchange economy; the monetary mechanism and financial institutions; the quantity theory of money and the price level; determination of interest rates and theories of interest; monetary policy instruments and objectives of Kenya's monetary system; institutions for the objectives of Kenya's monetary system; institutions for the international financial co-operation.

THIRD YEAR, SECOND SEMESTER

AEC 307: Economics Statistics II

Sampling distribution: random sampling, distribution of sample statistics; statistical inference: estimation; hypothesis testing linear regression and correlation; linear regression model, evaluation of linear regression models; the correlation coefficient; introductory multiple correlation and multiple regression; time-series analysis; basic concepts; secular trend, the moving average, measuring seasonal variation, measuring cyclical variation; analysis of variance; completely randomized design; randomized complete block design; the Latin square design; the factorial design; non-parametric statistics.

AEC 316: Industrial Economics

Theory of the firm and industry; determinants of market structure; paradigms in industrial economics; Neo classical(structure-conduct-performance) Austrian, Marxist and post Keynesian; oligopoly theory, theory and practice of pre-competitive government policies; competition policy; product quality, technological innovation and market structure; state intervention, private sector and industrialization, industrial product and worker safety and environmental protection; approaches to industrialization: the Japanese American and European approaches; Kenya's industrial structure and policy; industrial performance measurement.

FOURTH YEAR, FIRST SEMESTER

AEC 403: Development Economics

Meaning and measurement of economic growth and development; alternative theories of development; strategies for development; relevance of theories to development strategies adopted by Less Developed Countries (LDC) in general and Kenya in particular; agriculture and rural development; industrialization strategies: import substitution and export orientation in East Africa; problems of inflation population, foreign aid, debt crisis, foreign investment, structural adjustment programme, balance of payments and adjustment to their social consequences.

AEC 404: Research Methods

Meaning and objectives of research; quantitative and qualitative research methods; sampling techniques; data collection methods; questionnaire design and administration; data processing; data presentation, description and analysis techniques; basic computer concepts; basic skills in report writing.

FOURTH YEAR, SECOND SEMESTER

AEC 402: Public Finance and Fiscal Policy

Sources of government finance; nature of public revenue and expenditure; rationale for government intervention in an economy; public expenditure; patterns of public expenditure, cost benefit analysis of public projects, control and Adjustment policies, institutional frame work (i.e. Treasury and parliament); principles of taxation, income, taxation and labour supply, tax evasion

and the informal sector, optimal taxation theory, expenditure taxes; tax analysis with special reference to Kenya; Kenya's fiscal policies.

AEC 410: Development Planning

Theories of development planning; nature and role of economic planning development planning and market processes. planning experience in developing countries; types of plan; tools of planning applied to open and closed economies; macro models, multisectorial models, including input-output analysis; social accounting; linear programming and general equilibrium models; cost-benefit analysis.

BUSINESS STUDIES

FIRST YEAR, FIRST SEMESTER

ABA 101: Introduction to Business Studies

Objectives of business firms, business and society, business and government, ethics in business; trade and chain of distribution, settling indebtedness in business; forms of business ownership: sole proprietorship, partnership, limited companies, government agencies, co-operative movement in Kenya; nature and role of stock exchange with special emphasis on the Nairobi stock exchange; major business management functions: planning, organizing, directing, controlling, staffing, budgeting and delegating responsibilities.

ABA 103: Introduction to Accounting I

Scope and role of accounting; Theoretical basis of accounting; the basic principles of accounting; the accounting equation; the accounting terminology; accounting procedures and techniques: double entry book-keeping; the journals; the role of ledgers in summarizing data; the trial balance; income and expenditure; balance sheet; closing entries; adjustments; the accounting treatment of fixed assets; the petty cash book; the bank reconciliation statements; accounting errors; incomplete records; control accounts.

FIRST YEAR, SECOND SEMESTER

ABA 107: Management Mathematics I

Basic concepts: Set theory, Venn diagrams; Functions: linear and non-linear functions; establishing functions and application of functions; simultaneous equations. Mathematics for finance: simple and compound interest, present and future values, annuities, capital investment appraisal.

ABA 109: Introduction to Accounting II

Review of accounting process. Basic final accounts of sole proprietors; partnerships; limited liability companies; non-profit making organizations; accounts of professionals-doctors; solicitors accountants, etc; manufacturing accounts; consignment accounts. Final accounts of financial institutions.

SECOND YEAR, FIRST SEMESTER

ABA 202: Introduction to Finance

Scope and nature of business finance; sources of Business Finance; ratio analysis; financial forecasting; financial planning and budgeting; breakeven analysis; capital budgeting; financial structure analysis; application of leverage on the cost of capital; introduction to budgets and budgeting control procedures.

ABA 203: Intermediate Accounting I

Accounting for assets: theories; valuation at acquisition, treatment of expenditure over life of assets, and disposition, allocation of cost to useful life. Accounting for investments. Specialized accounts: farm accounts; hire purchase accounts, joint ventures, royalty accounts.

SECOND YEAR, SECOND SEMESTER

ABA 206: Business Statistics

Nature and scope of business statistics; nature of statistical data; statistics as a tool of management; data collection analysis and presentation; measures of central tendency; measures of dispersion; Lorenz curves, consumer census and sampling probability theory: elementary concepts, permutation and combination, probability trees and decision trees, Bayes theorem; index numbers: basic concepts, construction of simple indices aggregate price indices, application of index numbers; introduction to bivariate frequency: regression and correlation.

ABA 209: Cost Accounting

Introduction to cost accounting: the nature and scope of cost accounting; cost accounting relationships; classification of costs; cost systems; the behaviour of costs; costing and controls of materials and labour; overheads: allocation and apportionment; costing methods and techniques; job order costing, process costing; activity based costing; standard cost and variable analysis; direct costing; application of marginal costing; by product, joint product costing and absorption costing.

THIRD YEAR, FIRST SEMESTER

ABA 303: Financial Management

Nature and scope of financial management; monetary mechanisms and selected financial institutions; sources of funds for investments; money and markets, financial analysis; financial forecasts; financial ratios; financial and operation leverage; capital budgeting techniques; portfolio management; capital asset pricing; arbitrage; opinion and future. Management of working capital; current liabilities, current assets, financing of current assets.

ABA 305: Auditing I

Nature and purpose of auditing: the linkage between auditing and accounting; types of audits; fraud, waste and Abuse (FWA); incentive mechanism to minimize FWA. The auditor in a professional and legal environment auditor and Accountants Act, auditor and Companies Act, auditors qualifications, rights, duties and removal. Auditors independence; legal liability of auditors, internal control; management accounting in areas of cash, debtors creditors and fixed assets. Internal auditor; role, responsibility and his relationship with the external auditor. The development of auditing in Kenya. The function of the controller and Auditor-General, the role of Parliamentary Accounts Committee (PAC).

THIRD YEAR, SECOND SEMESTER

ABA 315: Quantitative Methods in Business I

Probability theory:- Overview of probability, conditional probability, joint probability, Bayes theorem, Decision theorem; Decision making under uncertainty. Calculus: overview of

Introduction; limits and continuity; differential calculus, multivariate function integration; classical optimization Techniques and application of calculus. Inventory Control:- Introduction; Types of costs; types of control systems; Economic order quantity and fixed order quantity calculation, lead time and inventory control models. Time series analysis;- variation in time series; trend analysis; cyclical variation; seasonal analysis and irregular variation, an illustration involving all components. Network Analysis:- Overview of the Network analysis, PERT and CPM, time analysis and cost scheduling, crashing Networks and resource schedule.

ABA 327: Consumer Behavior

Essence of consumer behaviour; the consumer and market segment. Environmental influence on consumer behaviour: cultures, sub-cultures social class, social groups, family, personal influence; diffusion of innovation. Individual determinants of consumer behaviour: personality and self concept, motivation and involvement: information processing, learning and memory; attitudes, changing attitudes. Consumer decision processes: problem recognition, search and evaluation; purchasing processes, post-purchase behaviour. Researching and modelling consumer behaviour, consumerism, organizational buying behaviour.

FOURTH YEAR, FIRST SEMESTER

ABA 404: Management Accounting I

The nature, scope and purpose of management accounting; cost terms, concepts and classifications; the use of accounting information by management; cost accumulation for product costing; cost behavior patterns; elementary cost estimation; product costing methods; variable versus absorption costing; cost- volume-profit and analysis; budgetary control; standard costing and basic variance analysis; cost benefit analysis; relevant cost for management decision-making.

ABA 431: Research Methods in Business Management

Principles of research methodology; structuring research; locating summarizing and interpreting economic research; literature reviews; primary; data surveys and survey methods, case studies; primary data, questionnaire design and implementation, sampling techniques; secondary data,

use of published economic statistics, data compilation and limitations, calculations and interpretation; data analysis and presentation and basic report writing skills.

FOURTH YEAR, SECOND SEMESTER

ABA 418: Total Quality Management

Essence and scope of product quality, service quality; historical evolution of quality thinking; Deming's principles; the Juran trilogy; Feigenbaum and total quality control; Crosby's quality management maturity grid, cost of quality, Zero Defects; cross-function management; vendee-vendor relations; Just-in-time (JIT) cause - effect chain and fool proofing devices; total quality management model; quality function deployment, benchmarking and business process improvement; measurement of customer satisfaction, process re-engineering, root cause analysis, service quality management, supplier certification.

ABA 434: Business Finance

Scope and nature of business finance; source of business finance management of working capital; services of the banks to business firms and individuals; the concept of time value of money; introduction to techniques of capital budgeting under certainty; the role of discount market, merchant bankers, hire purchase companies and financial institutions, the stock exchange; forex and exchange control; a business transaction: types and documentation. measuring business performance; ratio analysis, use of ratios that measure solvency and liquidity, coverage ratios, financial stability ratios. Financial forecasting; capital budgeting - Co-operative Finance.

FRENCH

FIRST YEAR, FIRST SEMESTER

AFR 101: French Structure I

Acts of Speech: Description and types; correct and incorrect language usage in different situations. Study of related vocabulary and grammatical structures; adjectives and adjectival groups and agreement; pronouns; subordinate clauses; Technique of expression; passive; interrogative; active; pronominal voices; tenses; the future; the past; the imperfect; Tense

sequence; direct and indirect speech; Stimulation classroom interaction; The importance form; the comparative form.

AFR 403: African Novel and Short Stories

Novel and short stories by French speaking authors or in translation; with special emphasis of PostIndependence writers and their major concerns; works by the following; Miriama Ba, Yambo Ouloguem, N'debeka Maxime, Henri Lopes, Menga Guy, Sembene Ousmane, Mongo Beti, F. Oyono.

FIRST YEAR, SECOND SEMESTER

AFR 102: Art of Writing I

Communication in French; Standard situations of communication; Oral and written expression; Exploitation of narrative and description material for self-expression; comprehension; the art to composition; Presentation of ideas; Essay writing; different types of essays; narratives and descriptive; simulated communications (oral and written). Role-play; Micro-conversations; summary writing

AFR 408: Poetry

Improvement of written expression through poetry; works by a cross-section of poets; Leopold Senghor, Aime Cesaire, B. Dadie, Pierre Reverdy, Paul Eluard; Types of French verses; Types of classical poems; poetry through different literary movements, philosophies and thoughts.

SECOND YEAR, FIRST SEMESTER

AFR 201: French Structure II

Agreement in the past tense; Verb and noun agreement; number and gender; Expression for duration; the imperfect and past tense; Expression of hypothesis, possibility, supposition: the conditional tense, the pluperfect tense; the subjunctive; interrogative adjectives and pronouns; expression of quantity; partitive article; Expression of cause and consequence.

AFR 202: Basic Problems to Translation

Introduction to Translation (Basic Principles of Translation, Basic grammatical and lexical problems of translation; comparative treatment of structures and forms: French versus English: Translation of speech acts used in daily life in given situations of communication: Introducing oneself, greetings, expression of politeness; Finding and giving information; Emphasizing by means of prosody, and syntactic construction expressing feelings and perceptions, etc.

SECOND YEAR, SECOND SEMESTER

AFR 204: Art of Writing II

Different modes of communication; formal as opposed to informal types; formal situations of communication; writing of official documents; formal letter as opposed to informal; study of argumentative passage for essay writing: Structured formal essays: oral argumentation; demonstration; reasoning; speech acts and grammatical constructions used in formal expression.

AFR 206: Introduction to Phonetics

The international phonetic alphabet; French vowels and consonants; vowel classification; analysed; semi- vowels. The articulatory system; production and classification of vowels and consonant sounds; practical exercises in speech production.

THIRD YEAR, FIRST SEMESTER

AFR 302: Translation I

French versus English: French versus Kiswahili; Translation of short sentences showing grammatical differences between French and these languages; Translation of simple idiomatic expression into and from French: Translation of short texts dealing with daily life and contemporary problems extracted from newspapers, magazines, simple texts of the 20th century.

AFR 303: Introduction to French Literature

French literature through the study of selected authors, representing different literary movements, philosophies and thoughts: Existentialism, surrealism, the absurd, idealism Dadaism. Works of such authors as Camus, Sartre, Mairaux, Bernanos, Breton, Balzac, De Beauvoir.

THIRD YEAR, SECOND SEMESTER

AFR 304: Introduction to African, Caribbean and Malagasy Literature

The birth and development of different literary thoughts and movements through the Novel, Drama and Poetry; works of major writers of this period such as Leopold Senghor, Bernard Dadie, Franz Fanon, Aime Cesaire, Rene Maran, Jacques Roumain, J - J Rabearivelo, J. Rabemanajara; The effect of colonialism on Literary works.

AFR 305: Applied Linguistics

French linguistics and Grammatical analysis; Practical analysis of the French sentence; contrastive analysis in the teaching of French; Phonology. Morphosyntactic and lexicosemantic levels.

FOURTH YEAR, FIRST SEMESTER

AFR 401: Morphology

Word forms and how they relate to meaning in French; Phonology word, orthographical word and grammatical word; French word classes and their functions; French words and their interval structures.

AFR 402: French Literature in the 20th Century

Study of works by such writers as A. Camus, J.P. Sarte, F. Mauriac; contemporary writers such as Bernard Clavel; Study of cultural, political, Social aspects of society as seen in these works.

FOURTH YEAR, SECOND SEMESTER

AFR 404: Semantics and Lexicology

Sense relations such as synonymy, antonymy, homonymy, polysemy; semantics fields; lexical analysis; connotation, denotation collocations and neologisms.

AFR 405: Trends in Contemporary French

A study of the major trends in the development of the French Language; the diversifying and standardizing facts in. the use of contemporary French in the multilingual Kenyan society; A review of newspapers, magazines, journals and different literary form from France and French - speaking countries showing these trends.

ENGLISH

FIRST YEAR, FIRST SEMESTER

AEN 101: Introduction to Language

Theoretical definition of Language: Function of language basic characteristics of human and nonhuman language; theories on the origin and development of language; the form and functions of written languages: the major writing systems of the world; their strengths and weaknesses; languages in Kenya: focus on the sociolinguistic geography of Kenya; the role of English, Kiswahili and indigenous languages; language clusters in Kenya: Bantu, Nilotic, Cushitic,; broad

structural characteristics of language clusters: phonological, lexical and semantic; language and society; speech community; language varieties; language planning and language policy.

AEN 102: Introduction to Linguistics

The structure of language; introduction to linguistics: definition, scope and its relationship with other disciplines; descriptive and prescriptive linguistics; some linguistic theorists: Ferdinand de Saussure, Michael Halliday, Bloomfield and Chomsky; introduction to phonetics: articulatory, acoustic and auditory.

FIRST YEAR, SECOND SEMESTER

AEN 103: A History of English Language

The techniques used in historical and comparative linguistics; the notion of language families; the origins, development and spread of English language: Old English, Middle English and Early Modern English; varieties of English; English as a World Language; English as a Second Language and English as a Foreign Language.

AEN 104: The Art of Writing

The fundamentals of continuous writing; material collection, planning, paragraph development, punctuation, drafting and proof-reading; requirements for different functional, situational, non-literacy varieties of discourse; writing different types of essays-definitive, descriptive, comparative, contrastive, argumentative and expository; writing minutes, writing articles for mass media; preparing briefs and speeches; techniques in precise writing; systematic variations of sentence structure to create theme, rhyme and end focus; use of figurative speech; alliteration, allegory; characterization of poetic writing and variations in style in relation to topic, subject matter, situation, addressee-addresser relationship; writing for specific purposes.

SECOND YEAR, FIRST SEMESTER

AEN 201: Introductory English Phonetics

An overview of articulatory phonetics and the technical terms required for the description and classification of speech sounds; speech production mechanism; speech sound symbols and phonetic transcription; identification and classification of English vowels and consonants and their variants; an introduction to phoneme sequences in English; an introduction to binary features of place and manner of articulation; practical exercises in production and representation (transcription).

AEN 203: The English Word and Morphology

Definition of Word; Words and how they relate to meaning in English, e.g. phonological word, orthographical word and grammatical word; parts of speech - English word classes and their functions; words and their internal structure; word-formation processes; derivations and inflections; the concepts of a morph, a morpheme and a lexeme; practical exercises in morphological analysis.

SECOND YEAR, SECOND SEMESTER

AEN 204: The Structure of the English Sentence I

A study of English syntax at the rank of the Clause; elements of clause structure and its constituents, i.e. S.V.O.C.A. their positional restrictions and variations; clause features of concord, discontinuity and ambiguity; transitivity clause types; mood clause types; theme clause types; basic transformation within the clause; a brief examination of rank-shifted clause.

AEN 205: The English Group

A detailed study of the structure of endocentric and exocentric units: The Nominal Group - Types of nouns, pronouns and nominalization; types of determiners, modifiers, qualifiers and quantifiers; pre-head and post-head modification. The verbal group-simple, compound, complex verbal groups; finite; nonfinite verbal groups, tense, time, aspect and mood; operators, modals and - modules. The Adverbial Group-adjuncts, conjuncts and disjuncts; positional constraints. The Prepositional Group-as post modifier, complement, adjunct, indirect object.

THIRD YEAR, FIRST SEMESTER

AEN 302: The Structure of the English Sentence II

A study of the sentence as a unit of discourse; definition of a sentence - major/minor, complete/incomplete, Kernels/transforms; co-ordination, apposition, ellipsis, comment and correlative construction in compound sentences; subordination and rank-shifted clause in complex sentences; markers of subordination; structural and functional classification of subordinate clauses, sentence complexity and structural variation due to foregrounding.

AEN 305: The English Phonology

The course introduces the main approaches to the study of phonology; binary features, theory and classification of phonemic property, processes and rules.

THIRD YEAR, SECOND SEMESTER

AEN 311: Semantics and Pragmatics

Definition of semantics and pragmatics. Distinction between sentences, propositions and utterances. The notions: Agent, Patient, commutative and benefactor. The speaker's presentation of meaning and other participants in the creation of meaning. Systematic ways of explicating meaning: sense relations, componential analysis. The use of referring and non-referring expressions. The interpretation of meaning

AEN 314: Language Acquisition

The emergence of Psycholinguistics within the general field of Linguistics; Language, the brain and cognition; Theoretical models; Innatist, Behaviourist, Interactionist; factors in the process of first language acquisition and second language acquisition; Theoretical perspectives in Contrastive Analysis and Error Analysis; major findings in second language research; processing of linguistic data in the brain; some aspects of language mal-functioning: aphasia, memory lapses, lisping, stuttering, dyslexia.

FOURTH YEAR, FIRST SEMESTER

AEN 402: Functional Grammar

Theoretical definition of functional grammar. Functional grammar within systemic linguistics. Focus on the distinctions between various Schools of functionalism; a historical viewpoint in the

development of functionalism within the Prague School and the Post-Prague Theoretical formulation of functionalism leading to Hallidayan model of functional grammar. The analysis of English sentences within functionalism.

AEN 404: Advances in the Description of English Syntax

An examination of the description of English Grammar in different grammatical models; a general view of the development of and major issues of different grammatical theories and models e.g. traditional, structural, transformational, generative, systemic, case etc. and a discussion on how various structural aspects of English are handled by these Models.

FOURTH YEAR, SECOND SEMESTER

AEN 409: Practical English Stylistics

What is the style of a text? The description analysis of the English language in relation to the use to which it is put; the study, description and analysis of various samples of written and spoken texts by the canons of both literary theory and practice as well as the principles of linguistics analysis, the stylistic effects of the different features of the English Language e.g. Sounds, Morphemes, word groups, clause types and sentence variations, syntactic description and' style are put into practice in original student seminar papers analyzing prose passages by renown writers.

AEN 413: Discourse Analysis

An examination of supra-sentential features of language, with special reference to English, and a study of the relationships between utterances and their interpretation; markers of cohesion in connected discourse; a study of the relationship between “form” and “function” and between “grammaticality” and “meaningfulness”; Practical analysis of samples of spoken and written discourse, and classroom interaction

KISWAHILI

FIRST YEAR, FIRST SEMESTER I

AKI 101: Introduction to language and Linguistics

Language: definition; origins of language; characteristics of human language; Language behaviour and language systems; language and speech; spoken language in relation to written language; synchronic and diachronic linguistics; branches of linguistics: phonetics, phonology morphology, syntax, semantics.

AKI 102: Introduction to the History of Kiswahili

Theories of the origin of Kiswahili: Kiswahili as a Bantu language, Kiswahili as a dialect of Arabic, Kiswahili as a mixture of different languages, evidence, linguistic, historical and socio-cultural, Kiswahili dialects and their structure, Kingozi, Kibarawa, Kimvita, Kingare, Kimrima, Kimtang'ata, Kingwana; spread of Kiswahili in East Africa : the role of trade, religion and administration; colonial language policy on Kiswahili : Belgian Congo; British East Africa, German Tanganyika.

FIRST YEAR, SECOND SEMESTER

AKI 103: Introduction to Kiswahili Literature

Theories of definition of literature; forms of literature; written and verbal; role of Literature in society: educating, entertaining, informing; genres of literature; poetry: the epic “mashairi”, tarbia, takhmisa; free verse; ngonjera; plays; short story; novels; analysis of chosen texts.

AKI 104: Introduction to Linguistic Theory

The structure of language; substance and form; language, langue and parole; competence and performance; synchrony and diachrony; prescriptive and descriptive analysis of language; linguistic theories: traditionalism, structuralism, generative, transformational theories, post-structuralism, and their variants and criticism; leading linguistic theorists: Noam Chomsky, Ferdinand de Saussure; M.A.K Halliday, Leonard Bloomfield, Edward Sapir; Roman Jakobson; Michael Halle.

SECOND YEAR, FIRST SEMESTER

AKI 201: Theory and Standardization of Kiswahili

Definition of standardization; process of standardization; identification, codification, elaboration, acceptability; standardization of Kiswahili: Inter-territorial Swahili Language Committee and its

functions; identification of Kiunguja as base dialect for standardization; codification of Kiswahili; conflicts on acceptability of standard Kiswahili; current trends in standardization of Kiswahili.

AKI 202: Communication Skills in Kiswahili

Process of communication: speaker, message, medium, hearer, feedback; forms of communication: verbal gesture and sign, written; conversation; public speaking; soliloquy; letter writing; memo and report writing; writing a research paper: taking notes, library research, punctuating, paragraphing, presenting; examination writing: answering essay and structured questions, linguistic and literary type of questions; interviewing: writing of questionnaires.

SECOND YEAR, SECOND SEMESTER

AKI 203: Oral Literature I

Definition of oral literature; kernels of oral literature;--performance and actualization; audience improvisation; elements of poetry, song and musical accompaniment; Kiswahili Oral Literature; generic classification: epics, myths, legends, tales, fables, proverbs, riddles, songs, poems; social classification: ceremonies, occasions, rites of passage; oral forms in Kiswahili written texts, short stories, plays, novels.

AKI 204: Kiswahili Poetry

Origins of Kiswahili poetry in Arabic forms and traditional African songs; history of Kiswahili poetry from pre-20th century to the present; the Kiswahili “ Mashairi” form : metre, rhyme , alliteration sillabification, “ ubeti” stanza form, “Kibwagizo”; oral poetry in Kiswahili; ngonjera; taarab; the epic form; analysis of poems from selected texts.

THIRD YEAR, FIRST SEMESTER

AKI 301: Phonetics in Kiswahili

Definition of phonetics, concept of phone, branches of phonetics: articulatory, acoustic, auditory phonetics, sounds, of language and other sounds of communication, speech organs and production of speech, airstream mechanisms, analysis of speech into consonants and vowels;

consonants: place of articulation, manner of articulation, state of glottis, vowels, tongue position, vowel height, lip rounding, distinctive feature theory, sounds of Kiswahili language.

AKI 305: Kiswahili Novel

Definition, theory, origin and development of the Kiswahili Novel, the transition from oral literature to written novels, types of novels: detective, historical, novella, theories in Kiswahili Novel: social, political and economic, analysis of selected novels in Kiswahili.

THIRD YEAR, SECOND SEMESTER

AKI 309: Kiswahili Phonology

Definition and domain of phonology, relationship between phonetics and phonology, definition and identification of phonemes, phonemic distinctive feature, allomorphy, morphological alterations; phonological processes: assimilation and weakening, insertion, deletion, re-ordering, suprasegmental phonology: tone, stress, syllable identification, and preferred syllable structure, (PSS); the Kiswahili phoneme; phonological processes in Kiswahili.

AKI 310: Historical and Comparative Linguistics

Origin of Historical Linguistics and its development; diachrony and synchrony; Classification of languages: Indo-European, Romance, Bantu, Nilotic, Cushitic; the language map of the world; isoglosses; process of language change; the comparative method; principles of comparative linguistics; glottochronology and lexico-statistics; congruence and incongruences among languages; comparative study of Kiswahili in the language map.

FOURTH YEAR, FIRST SEMESTER

AKI 401: Kiswahili Morphology

Definition; the morph, allomorph, and morpheme; types of morphemes; Kiswahili as an agglutinating language; the Kiswahili word; inflexion and derivation in Kiswahili; the Kiswahili verb form; Kiswahili noun classes; Kiswahili word formation processes.

AKI 403: Kiswahili Play

Historical development of Kiswahili play; written drama during colonial era in East Africa; the transition from English to Kiswahili drama; integration of traditional cultural expressions to modern Kiswahili drama; ideology and theory in Kiswahili plays; pre-independence Kiswahili playwrights: Graham Hyslop, Gerishon Ngugi, Henry Kuria; post independence playwright: Ibrahim Hussein, Penina Muhando, Chacha-Nyaigotti Chacha, Emmanuel Mbogo, Jay Kitsao; analysis of selected plays.

FOURTH YEAR, SECOND SEMESTER

AKI 409: Kiswahili Syntax

Definition of grammar; syntax as part of grammar, the scope of syntax; grammatical and communicative competence; grammatical categories; words, groups, clauses, sentences; sentence types; simple, compound, and complex sentences; concordial agreement in Kiswahili; the structure of the Kiswahili sentence; surface and deep structures of sentences; a transformational-generative analysis of the Kiswahili sentence.

AKI 410: Kiswahili Semantics

Definition; types of meaning: conceptual, connotative, stylistic, effective, collocative, thematic; semantics and functions of language; lexical semantics: semantic fields, colour systems, idioms, hyponymy, synonymy, antonymy, polisemy, homonymy, fonestemy; semantics and the dictionary: types of dictionaries, the lexicon, types of lexical rule semantics and syntax; componential analysis.

LITERATURE

FIRST YEAR, FIRST SEMESTER

ALI 101: Introduction to Literature

Literature as an art; the nature of the raw material of literature; literature and social reality; Orature and written literature; form and content in literature; the thematic and aesthetic content of literature; the genres of literature; defining characteristics, differences and similarities; text performance and appreciation; the social function of literature.

ALI 102: Introduction to Literary Appreciation

Introductory literary criticism; What constitutes literature; Sources of literature genres of literature-prose, poetry, drama, essay and the defining characteristics; coloured writing; objective writing; tone; mood; setting; context; satire; irony; sarcasm; Figures of Speech: based on resemblance (simile, metaphor); based on contrast or surprise (Anti-thesis, epigram) based on association, (metonymy, synecdoche); Allegory, Fable, Parable, pun; euphemism; symbolism, signs, analogy.

FIRST YEAR, SECOND SEMESTER

ALI 103: Drama in East Africa

The origins of drama in East Africa; ritual, ceremony and festival as roots of modern East African drama; the colonial and post colonial background to East African drama; representative plays by such playwrights as Serumaga, Ngugi, Ruganda, Rugendo, Imbuga, Watene, Hussein , Muhando and Mbogo; the impact of drama festivals in play writing in East Africa.

ALI 104: Prose in East Africa

Early prose in East Africa; settler fiction; the anthropological character of early works; colonial and post- colonial fiction; representative fiction by such writers as Huxley, Ngugi, Meja Mwangi, Enerriko Seruma, Oludhe Macgoye and Sam Kahiga; common features of East African Fiction.

SECOND YEAR, FIRST SEMESTER

ALI 201: Literature and Language Use

The function of phonological, morphological, lexical, morphosyntactic and syntactic features of language in literature; varieties of language such as colloquial, standard, official, legal and their relationships with literature.

ALI 202: Literary Theory and Criticism

The general theories of literature and literary criticism; their relevance to social, cultural and historical development; the Platonic and Aristotelian concepts of literature; the more recent varieties of literary theories and criticism such as New Criticism, Formalism, Structuralism,

Marxism and others; specific trends of literary scholarship with close reference to the East African situation; study of critical works by selected critics.

SECOND YEAR, SECOND SEMESTER

ALI 203: Poetry in East Africa

Definition and scope; source and growth; classical Kiswahili poetry; forms and unique characteristics; integration of poetry in East Africa and the literary genres; study of selected texts like Okot, Nturu, Angira, Yambo, E. Standa, A. Luvai.

ALI 204: Orature in East Africa

Definitions; orature and literature, development of orature into an academic discipline; form and content of orature; orality and literalness of orature; performance and scholarship; sub-genres of orature - the narrative, song and the short form; study of selected texts. Aspects of orality in written texts. General methods and techniques of fieldwork

THIRD YEAR, FIRST SEMESTER

ALI 301: Classical Theories of Literature

Definition classical theorists; Plato on imitation and morality Aristotle on imitation literature-and truth, tragedy; Longinus on the sublime; Horace on unity in Art; object of imitation; relation between classical theories and writings of Homer, Ovid, Sophocles, Euripedes, Dante.

ALI 302: Creative Writing I

Fundamentals of continuous writing; planning, paragraph, stanza, dialogue development, punctuation, drafting and proof-reading; graphological conventions of formal and informal writing; technique in precise writing, systematic variation of sentence structure to create rhythm, suspense and expectation; foregrounding; use of figurative language and choice of words; subject matter; addressee- addresser relationship.

THIRD YEAR, SECOND SEMESTER

ALI 308: Stylistics

A linguistic based analysis of style; interplay between form and content; different levels of aesthetical language; the concepts of style in literature; application of these concepts, analysis of texts across all literary genres.

ALI 309: Modern Theories of Literature

Modernism in relation to formalism; reader response theory; structuralism and semiotics; the functions of signs and symbols at theoretical levels; deconstruction and post-structuralism; view points of Jacques Derrida, Paul de Mann, Michael Foucault and Fish S. and semiology in the discourse of the human science; psychoanalysis and psychology as seen by Peter Brooks, Jacques Lacan and Sigmund Freud; Marxism as a literary theory relating to base and superstructure in creativity; feminism; gender and sex, theories of Orature.

FOURTH YEAR, FIRST SEMESTER

ALI 401: The African Novel

Characteristics; features; thematic concerns and its evolution; the development of the novel from authentic and indigenous African form to contemporary forms; the blending of African themes and Western languages to create the contemporary African novel: the role of the African novelists as a social critic in independent Africa: study of selected African novelists (like Achebe, Ousmane, Peter Abrahams, Armah, Ngugi)

ALI 406: Latin American Literature

Selected genres in English translation; the interplay between realism and fantasy and history; study of selected literary artists such as Pablo Neruda, Garcia Marques,

FOURTH YEAR, SECOND SEMESTER

ALI 408: Modern African Poetry

Major thematic and literary trends since the 1930s and the influence of African experience; the poetry of negritude poets like Sedar Senghor and David Diop compared with poetry of liberation movement in Lusophone Africa by writers like Neto, Jacinto and Marcelino Dos Santos and Anglophone Artists like Okigbo, Soyinka Awonoor, Taban, Angira, Okot p' Bitek unique poetic-qualities-and-sensitivity, POST independence experience of the continent.

ALI 410: Drama from the rest of the world

A study of non-African drama; the classical Greek theatre; the Elizabethan drama and the various movements in European drama from Ibsen to Beckett; analysis of texts by selected playwrights(Aesechylus, Sophocles, Euripides, Marlowe, Shakespear, Ibsen, Chekov, Brecht, Miller, Beckett and Pinter).

RELIGION

FIRST YEAR, FIRST SEMESTER

ARE 101: Introduction to Religion

The concept of religion; nominal, descriptive definitions, the wide variety of such definitions; Analysis of relationships between religion and magic, revelation, faith and reason, morality, mysticism and theism; discussions of the concept of original revelations; evaluation of prevailing critique of religion.

ARE 102: Jesus of History and the Christ of Faith

General life in Palestine; political and religious; The life and teaching of Jesus Christ as portrayed in the Gospels; His birth and early life; the significance of the Baptism and Temptation; the Galilean Ministry, Transfiguration, Journey to Jerusalem; the miracles and their significance; the parables and their meaning within the context of Jesus' ministry. The teaching of Jesus on specific issues such as forgiveness, prayer, love, wealth and the spirit. The redemptive act of Jesus; Passion, death and resurrection; Christology in the Epistles.

FIRST YEAR, SECOND SEMESTER

ARE 103: History of Religions I

The importance of the study of religion; the history of the study; theories of the origin of religion; fetishism and magic, naturism, animism and animatism, euhemerism, totemism and the Oedipus complex; religious traditions of various people of the world; religions of pre-historic man and select preliterate peoples, with special attention on African Religion and Religions of India: Hinduism, Jainism, Sikhism, Buddhism.

ARE 104: African Religion

Reason for the study of African Religion; problems encountered in the study: past and present; the nature of African Religion; the conception of God, Divinities, Ancestors and Spirits; the African view of man; family and kinship systems; Religious Specialists, transition rites; communal and personal rites; magic, witchcraft and sorcery and the interaction between African

Religion and Christianity on the one hand, and Islam on the other; African Religion today and the prosperity for its future.

SECOND YEAR, FIRST SEMESTER

ARE 201: Phenomenology of Religion

Phenomenology as a concept, its general methodology, its application to religion, theories of the origin of religion; religious experience and its expressions in thought, action and fellowship; religion in human society, the methodology, schools of thought as represented in the traditions of Emile Durkheim and Marx Weber; the functions of religion in society in general, and to the individual in particular; impact of science. Marxism, existentialism and secularism; religion as understood and practiced in Africa.

ARE 205: The Life and Teaching of Prophet Muhammad

The life and teaching of the Prophet Muhammad; general life in **Makka**, the birth and early life of Muhammad, the call (**Bath**), **Risalah** and Revelation; the early Muslim community and persecution in (Makka), grant of asylum by the King of Abyssinia, **Isra Wal Miraj** The **Hijraa**, the Muslim **Umma**, the Battle of **Badr** and **Khandag** the truce of **Hudaibiyya**, conquest of **Makka**. Teaching on specific issues such as brotherhood of man, racism, slavery, status of women, tolerance for adherents of other religions.

SECOND YEAR, SECOND SEMESTER

ARE 207: Ethics I

Theories of ethics; free will and determinism; objectivism; right and wrong; pleasure and happiness; good and evil; equality and justice; man and moral obligations to himself, honesty, faith, hope; to his fellow men, kindness, sympathy, love, tolerance, ethics in various cultures and religions such as African, Christian and Islam.

ARE 209: History of Christianity

The origin and development of Christianity up to 1500 A.D.; Jewish background; Jesus and Founder; the place of Paul; the Apostolic Church; the period of the Church Fathers; persecutions;

primacy of Rome; Church Councils; the rise of medieval Christianity; encounter with Islam; disintegration of the Christian medieval pattern.

THIRD YEAR, FIRST SEMESTER

ARE 301: Philosophy of Religion

Questions related to religion; the nature of religion itself, the traditional arguments for the existence of God, the critiques of the arguments and the relevance of such to religion; the nature and attributes of God; the problems of evil; faith and reason; the 'question of miracles and revelation; religion and ethics; classical and modern irreligion; existentialist, positivistic and pragmatist approaches to religion; African Philosophy and religion.

ARE 302: Old Testament Studies I

General introduction to the Old Testament; the Text; the canon; the Old Testament; questions of authorship, sources, dates, contents and characteristics of the books in order of the Hebrew Canon; The Law (Gen. -Deut.), the prophets (former and latter), and the writings (Psalms-Nehemiah); the Apocrypha.

THIRD YEAR, SECOND SEMESTER

ARE 312: Ethics II

An investigation of man's obligations and rights arising from his relation to God and to his own person -analysis of man's nature with its implications for the family and society - benevolence, social justice and tolerance.

ARE 316: New Testament Studies I

General introduction to the New Testament; the text and its transmission; the sources of the text, Greek manuscripts, versions and Patristic Quotations; the Canon; special introduction to the New Testament: history of the individual books, sources, dates and places of writing, the identity of the authors and intended readers, integrity, occasion and contents of the books.

FOURTH YEAR, FIRST SEMESTER

ARE 401: Contemporary Religious Thought

Historical survey of religious thoughts from the mid twentieth century to the present; major issues in contemporary religious debate; Secularization, religion and science; secularistic trends such as existentialism; humanism, neo-marxism and liberation theologies; contemporary religious movements such as ecumenism; evangelical revivalism; models of inter-religious relationship.

ARE 403: Religion, Education and Development

The role of religion in education and socialization of the African in the pre-colonial, colonial and postcolonial periods in Kenya. African traditional modes of education and socialization, both formal and informal; religion and religious texts as the substantive content of education in the process of Christianization and the educational institutions; religion and the health institution; religion and communication institutions; co-operation between religious institution and the state in modern development.

FOURTH YEAR, SECOND SEMESTER

ARE 410: New Religious Movements

The various religious groups and movements that are found particularly in Kenya; those of Asian and oriental origin and which have Kenyan members; locally originated movements like Nomiya Luo, Dini ya Musambwa, Mumbo, African Independent Pentecostal Church of Africa, Legio Maria; the relationship and influence of these movements to African religion, Buddhism, Christianity, and Islam.

ARE 414: African Theology

Definition of African theology; the idea of God; writings of African ideas of God in western eyes; the worship of God; God and the human person in Africa; God and the community, God and nature; an African theologian; relationship between African theology and other theologies such as Biblical Theology, Quranic Theology; African theologians: John Mbiti, J.K. Mugambi, E.B. Idowu, R.B. Kibongi, Vincent Mulago, Adeolu Adegbola, Charles Nyamiti; their theological teachings.

MUSIC

FIRST YEAR, FIRST SEMESTER

AMU 112: Fundamentals of Music

Chromatic and diatonic scales: major harmonic and melodic minor scales, simple compound intervals, their inversions and classification: major, minor, perfect, diminished and augmented, triads, root, first and second inversions and their classification, doubling, spacing, close and open positions, modulation, circle of fifths.

AMU 113: Practical Performance I

Individual tuition on African, and Western musical instruments of student's own choice from available instruments. Group instruction in recorder choral performance and conducting. Introduction to choreographed dance performance selected from Kenyan communities.

FIRST YEAR, SECOND SEMESTER

AMU 114: Compositional Studies and Practical Musicianship I

Creative and performance skills which are embodied in theory, aurals, and practicals. Theory compositional technique; diatonic triads and their inversions; and the harmonic basis of melodies and cadences. Aurals: melody writing and reading in major and minor keys, simple and compound time; recognition of intervals.

AMU 115: Practical Performance II

Individual tuition on African and Western musical instruments of student's own choice from available instruments. Group instruction in recorder, choral performance and conducting, choreographed dance performance selected from Kenya communities.

SECOND YEAR, FIRST SEMESTER

AMU 215: Introduction to African Music and Dance

Definition of music and dance, origins of music, types of music: folk, traditional, art, popular music and dance. Uses of functions of music and dance. Socio-cultural background of Kenyan

Music and Dance. Characteristics: socio-cultural contexts: study of song and dance patterns: neo-traditional contemporary African music and dance. General classification of African Dance. Factors that influence the songs, dances costumes and instruments of different communities. Analytical listening to vocal and instrumental music.

AMU 216: Compositional Studies & Practical Musicianship II

The basic compositional skills, two part writing in counterpoint, adding descants and lower parts to given tunes and melodies: the writing of parts for transposing instruments; sight reading aural perception and recognition of two part melodies; aural recognition of three different parts sounded simultaneously.

SECOND YEAR, SECOND SEMESTER

AMU 218: Compositional Studies & Practical Musicianship III

Writing piano accompaniment for melodic instruments including voice, dominant sevenths, secondary triads and their inversions, harmonic progression, setting music to words for given voice combinations. Aurals: two part melodies, intervals, cadences, and modulations sight-reading.

AMU 219: History of Western Music:- PreBaroque/Baroque

Plainsong: chants and modes, early polyphony, organum, conductus, clausula, Motet. Notre Dame School, motet, medieval dances and instruments, transitions to the Renaissance. Contributions of Burgundian and Flemish schools, stylistic features of sixteenth century musical development stylistic features of Baroque music; instrumental forms: fugue, suite, concerto grosso, solo concerto, sonata; vocal forms: opera oratorio, cantata, chorale, motet, passion. Composers: Bach, Handel, Vivaldi, Rameau, Lully, Couperin, Domenico Scarlatti.

THIRD YEAR, FIRST SEMESTER

AMU 317: African Musical Instruments

Classification of Kenyan and traditional musical instruments of Africa. Regional distribution of instruments in Kenya, tuning systems, socio-cultural significance of selected instruments, regional distributions, factors influencing distribution, tuning systems socio-cultural significance, Analytical listening to Kenya instrumental music, instrumental music. Construction of selected instruments.

AMU 318: Compositional Studies & Practical Musicianship IV

Passing and cadential six four chords modulation to closely related keys, dominant sevenths, harmonization of a given melody, composing simple pieces for voice and instruments. Aural: sight reading in all the clefs, aural recognition of two part music, compound intervals, modulations and chord recognition. Simple chord accompaniment on the keyboard/guitar using primary chords.

THIRD YEAR, SECOND SEMESTER

AMU 320: Compositional Studies & Practical Musicianship V

Introduction to two-part canonic writing: non-harmonic tones, strict counterpoint in common time; four part-harmony, introducing secondary dominant chords, simple exercises in orchestration. Aural: two- part dictation, recognition of chords and their inversions, sight reading including chromatics. Simple choral accompaniment on the keyboard / guitar using primary and secondary chords.

AMU 321: Western Music History Classical and Romantic

The classical orchestra; sonata form, symphony, concerto operas, the Mannheim, Milan and Viennese schools. Composers: Haydn, Mozart, Gluck, CPE Bach, Beethoven; Characteristic features of classical music. The orchestra, German Lied piano music, programme, song cycle, concert overture, church music, romanticism, neo-classicism, expressionism, emotionalism, nationalism: The Russian Five. Composers: Schubert, Schumann, Wagner, Brahms, Tchaikovsky, Chopin, Debussy, Mendelssohn, Bizet, Frank Cesar, Rossini, Clara Schumann.

FOURTH YEAR, FIRST SEMESTER

AMU 420: Ethnomusicology I

Definitions of ethnomusicology, origins, theories, and historical development in ethnomusicology, contemporary thoughts and approaches in ethnomusicology, methodology, laboratory and field work. Methods of transcription; transcription of melodies with text, transcription and notation of dance patterns, problems and limitations in transcribing African music, modern technological developments.

AMU 421: Advanced Compositional-Studies and Practical Musicianship

Advanced harmony in five parts, introducing higher dominant discords, free and strict counterpoint for voices or instruments, imitative writing for both voice and instruments. Aural: advanced sight reading syncopated rhythms. Keyboard/guitar accompaniment.

FOURTH YEAR, SECOND SEMESTER

AMU 423: Ethnomusicology II

Field study project: Students will be guided on field study projects within an appropriate focus area as decided by the Department. They will proceed on field study within the first two weeks of opening. Each student will submit the project two weeks before the commencement of written examinations. The project comprises of field recording, documentation and selected transcription.

AMU 424: Form and Analysis

Strophic Form, Simple Binary Form, Classical Suite with its attendant movements: Minuet and Trio, Allemande, Sarabande. Gavotte, Courante and Gigue, Marches, 'Art Songs', Song Cycle and Variation Forms. The Canon and Figure, Evolution of the Sonata Form, Overture, the Opera, Ballet, the Cantata, Mass and Oratorio, the Orchestral Symphony and Symphonic Poem.

GEOGRAPHY

FIRST YEAR, FIRST SEMESTER

NGE 101: Introduction to Geography

Introduction to geography as a discipline; definition and purpose; origins of geography; tradition and themes in geography; nature and scope of geography; geographical methodology; branches and relationship with other disciplines; the global environment; concepts of weather and climate; atmospheric energy; moisture, the general circulation of the atmosphere; climatic patterns; environmental change - the processes and consequences of urbanization; important environmental and developmental issues such as desertification, population and food crisis.

NGE 102: Map Interpretation and Descriptive Statistics

Types of maps; topographical maps; climatic maps; geological maps, population maps; understanding maps; significance of projections; marginal information; symbols and lettering and significance of projections marginal information; significance of scales, topographical maps, landforms, slopes and profiles, stream geometry, river basin analysis, settlements, land use and communications.

FIRST YEAR, SECOND SEMESTER

NGE 103: Fundamentals of Physical Geography

The structure and materials of the Earth; landforms and land forming processes: vulcanicity, compression and Tension forces, weathering and Erosion. Major features of the Earth's surface. The Earth-Sun relationship; solar radiation and depletion; the atmosphere and ocean; wind systems and global circulation; atmospheric moisture and precipitation; major world climates. The concept of Ecosystem; major ecosystems of the earth; ecology and ecosystem development; human impact on the biosphere.

NGE 104: Spatial Organization

Fundamental concepts; recent trends in geography; geography as a science; explanations of geography; hypotheses theories and models, general systems theory. Cognitive mapping and perception studies; location of human activities, the basic concepts and location; location and use

of rural land; the location of urban places and central place theory; theories of urban land use; spatial interaction; the bases of spatial interaction; the concept of distance; migration and decision making; spatial interaction models; gravity and spatial diffusion models.

SECOND YEAR, FIRST SEMESTER

NGE 201: Geographic Thought

The emergence of geographic thought and theory; the relationship between geography and other disciplines; geography as a science; explanations, hypotheses and models in geography; classical traditional geography from the Greeks to the modern founders of geography, Ptolemy, Strabo and the Germans; the origin of ecological studies in geography - Darwin's theory; contributions to geographic studies from the biological and physical sciences; human orientations in geographic studies; methodological revaluations in geography; the emergence of the environmental movement in Geography.

NGE 202: Climatology

The philosophy and methodology of human geography; the evolution of modern geography; the classical modern and contemporary, introduction to concepts of human geography; palaeoclimatology and the human tenure of earth; man as an ecological agent; man's role in changing the face of the earth; the human environment from simple to complex societies; the link between environment and human economies; ecosystem and human development linkages; locational analysis and cultural considerations in the human environment; human settlements and global human activities; introduction to principles of resource conservation.

SECOND YEAR, SECOND SEMESTER

NGE 206: Transport Geography

Introduction to transportation and related lines of communication, traditional approaches to transportation; modern trends in transportation; general and theoretical bases of transportation; bases of spatial interaction; structure of the transport network; technical and economic characteristics of the transport system; basic factors relating to transport; locational; studies; vehicle supply modal systems; other liens of communications; geographic change in transport patterns since world War I; Transport expansion and planning in developing areas; evaluation of

the transportation network; decision making and transport and communications; other infrastructural facilities influencing development.

NGE 211: Geomorphology

Trends and concepts of geomorphology; Structure and materials of the earth; global tectonics and continental drift; Faulting and Folding; vulcanicity; processes of landforms weathering and mass wasting. Glacial and per glacial landforms. Denudation and climate, wave action and coastal landforms, arid and semi-arid landforms, Karst processes and landforms. The concept of dynamic equilibrium.

THIRD YEAR, FIRST SEMESTER

NGE 301: Quantitative Methods

Elementary statistics and computing procedures; basic descriptive statistics; probability concepts; application of probability theory; elements of sampling methodology; testing and significance of data samples; inferential statistics; one way — two way analysis of variance.

NGE 304: Economic Geography

Introduction to economic geography; theories and concepts in economic geography; nature and scope of economic geography; natural and human resources and their classification; human resources development; the development; models of industrial location; industrialization and development; transportation and production and distribution principles; patterns of international trade; application of economic geography to regional organization and planning; infrastructural facilities; national savings and foreign aid investments; centre periphery concept and under-development.

THIRD YEAR, SECOND SEMESTER

NGE 309: Fieldwork Project

Students will go for fieldwork for a period of two weeks in the second semester. The area for the fieldwork will be determined by the program. The fieldwork project will consist of problem identification; theoretical models; and other relevant research methodology; at the end of the fieldwork, students will be expected to write a report, which they will present, to the concerned staff members for examination.

NGE 312: Biogeography

The nature and scope of biogeography; habitats and micro-habitats; ecosystem and energy exchange; plant mineral nutrition and bio-geochemical cycles; the wetland ecosystem; terrestrial and aquatic biomes; net primary production; environmental pollution and its effects; crop production and the green revolution; ecological bases for agriculture; agricultural impacts on ecosystem; cultural biogeography; world terrestrial and aquatic biomes; soil, plant and animal systems as related to the terrestrial environmental protection and conservation; practical biomic treatment; phytogeography and zoo-geography for economic biogeography.

FOURTH YEAR, FIRST SEMESTER

NGE 401: Regional Development and Planning

Introduction to the world economies; the physical and human background(s) of Africa with emphasis on east Africa especially Kenya; regional development variables; physical and human; principles of ecocodevelopment; role of industrialization in regional development; regional development and planning implication; role of urbanization in regional planning; growth pole and growth centre models; urban and regional development planning models in support of district focus strategies; coordinated economic development, hierarchical regional and all theoretical planning models and related tools feasible for developing economies; resultant planning adjustments.

NGE 407: Arid and Semi-arid Lands

Physical realm of aridity; global locations, their potential and status. Classification and utilization of soils, agriculture and vegetation; climate and Geomorphologic processes; weathering and erosion. Conflicts. Desertification. Conservation and sustainable utilization of arid environments. Regional case studies of arid developments.

FOURTH YEAR, SECOND SEMESTER

NGE 412: Urban Geography

Introduction to urban geography; historical perspectives of urbanization; approaches to and development in urban geography; social dimensions of modern urbanization and urbanism, the social geography of the city; housing supply and residential mobility and structure; spatial organization and locational conflicts; urban problems; trends politics and planning; the emergence of world urban systems; theories of urban structure and the internal structure of the city; urban and regional planning policies, case studies of urban planning with emphasis on Kenya.

NGE 414: Industrial Geography

The contemporary and political map of Africa; spatial characteristics of African states; the geographical basis of African unity; the African environment as a resource for utilization; agricultural development and problems; spatial aspects of economic activity; trade and development in tropical Africa; population characteristics and problems; change and its challenge in Africa.

HOME SCIENCE

FIRST YEAR, FIRST SEMESTER

FTM 140: Introduction to Textiles

Natural and synthetic fibers: their origins, features, composition and properties; microscopy and analysis of fibers; yarn types, formation and classification; fabric construction methods; functional and aesthetic finishes on fabrics; labeling and standardization; laboratory experiments on physical, burning and chemical identification of fibers.

FHT 201: Principles of Human Nutrition

Body composition; macro and micro nutrients in food; contribution of food to major body functions; sources, metabolism and functions of proteins, carbohydrates, fats, minerals and vitamins; energy requirements of the human body in different physiological states; use of food composition table and calculation of nutrient content of food; human requirements for energy; scientific principles underlying food preparation; standard methods of food preparation with emphasis on nutrient retention.

FIRST YEAR, SECOND SEMESTER

FHT 203: Household Equipment and Technology

Large and small household equipment, characteristics of base materials and finishes used on equipment; fuels used in the operation, of household equipment: safety in use and conservation measures; evaluation of equipment in terms of choice, use, maintenance and storage; impact of technology on the household in relation to equipment; innovations in equipment design.

FHT 206: Family Resource Management

The use of Home Management principles and concepts in family and individual endeavor; identification and use of family resources: human and non human; management process in relation to resources; values, goals and standards; decision making process, ergonomics and the management of work; work simplification; application of the systems approach.

SECOND YEAR, FIRST SEMESTER

FTM 143: Clothing Construction I

Principles and techniques of constructing garments; social, psychological and economic aspects in the selection of family clothing; selection of appropriate style; functional and decorative use of textiles for clothing; consumer attitudes; cultural aspects of clothing.

FHT 202: Basic Culinary Skills

Methods of cooking various foods; the aesthetics of food presentation; garnishing; organoleptic evaluation of different foods. The course is largely practical and aims at giving students hands-on experience in cookery and use of developed recipes to prepare different foods.

SECOND YEAR, SECOND SEMESTER

FTM 145: Clothing Construction II

Selection of fabric and sewing notions; pattern drafting: production of block patterns for men, women and children's wear based on body measurements; basic tools for construction of "muslin shell"; fitting: diagnosis and remedies of fitting problems; preparation and attachment of various garment units.

FHT 210: Meal Management and Service

Selection, purchase, preparation and service of food to meet individual, family and social needs; the parameters of family decision-making process focused on the trends of the food market economy; the management of resources related to feeding the family; planning of various meals; choice, purchase, storage and preparation; planning and serving meals for special occasions and groups.

THIRD YEAR, FIRST SEMESTER

FHT 124: Housing and Home Furnishing

Basic housing needs for families in Kenya; satisfaction of housing needs through renting, building and buying; physical, social, economic and environmental aspects of housing in relation to individual and family satisfaction; reading, interpreting and evaluating plans for different designs of family houses; home improvement; selection and care of materials and finishes for various surfaces in the home including floor coverings, window treatment and upholstery; room design.

FHT 209: First Aid and Home Nursing

Common communicable diseases: malaria, water borne diseases, HIV/AIDS, etc.; first aid for common accidents-and-ailments-including-burns, scalds, poisoning, snake-and insect bites, fainting sprains-and fractures, etc.; care of the sick at home; the sickroom; food hygiene, clothing for the sic; prevention of common communicable diseases.

THIRD YEAR, SECOND SEMESTER**FHT 301: Consumer and Family Economics**

Sources of consumer information; resources available to the consumer; advertising: role in family decision making process, advantages and disadvantages; principles of consumer buying, common methods of buying goods and services; budgeting; consumer protection agencies, legal protection of the consumer.

FHT 401: Therapeutic Nutrition

Basic concepts: diet therapy, dietician, dietetics, and therapeutic diet; the role of the dietician in the hospital and the community; nutritional and dietary assessment tools and strategies; factors in care and rehabilitation, modifications to the normal diet: clear liquid, full liquid, soft, semi-solid and brand diets; diet in relation to febrile conditions, infections, burns, GI disturbances, HIV/AIDS, other conditions; practical classes on planning and preparation of various diets and dietary management during disease.

FOURTH YEAR, FIRST SEMESTER**FHT 102: Individual and Family Development**

Application of principles of human growth and development in family life cycle; mate selection and marriage, conception, pregnancy and child birth; prenatal and post natal care: feeding, clothing, immunization, habit training, play and other developmental tasks; adolescent development; population dynamics and family planning.

FHT 306: Home Management Practicum

Management in the home through living-in experiences; basic principles of laundry; applied management of household equipment and appliances; interpersonal relationships, planning and

utilization of family resources; home decoration, cleaning the home; feeding the family, application of budgeting techniques, time and energy management, division of labor.

FOURTH YEAR, SECOND SEMESTER

FHT 312: Food Technology

Application of sciences to the development, manufacture, marketing and protection of food products; impact of technology on food; micro-organisms involved in food borne illnesses; food spoilage and fermentation; sanitation and safety in food production process; food preservation techniques; use of beneficial micro-organisms in food processing, thermal processing; chemical processing and irradiation; packing of food, distribution and storage; food insecurity.

FHT 411: Wardrobe Selection, Management and Care

The clothing ensemble; visual analysis of dress and interaction of apparel on the human body; clothing and fashion as communication; behavioral theories of fashion; planning a wardrobe; accessorizing; clothing care: care labels; dry cleaning, stain removal, storage.

COMPUTER SCIENCE AND TECHNOLOGY

FIRST YEAR, FIRST SEMESTER

SCS 102: Discrete Structures

Logic, Boolean algebra and logic circuits, set theory, counting techniques, computer arithmetic, graph theory and matrix algebra with applications to computing; functions; Proof techniques.

SCS 103: Programming in Pascal

Notations and fundamental concepts; Data type and declarations; statements, expression and assignments; simple input and output; Basic control structures; procedures and functions; arrays; records; sets; files; Pointers:- pointer Concept, programming a stack, non-linear structures, storage tailoring,

FIRST YEAR, SECOND SEMESTER

SCS 109: Assembly Language Programming

Machine organization: CPU architecture; Fundamentals of Machine language and addressing; Assembly language programming using the instruction set of a typical microprocessor.

SCS 116: Programming in C

Introduction; basic data types and operators; statements and control flow; functions and program structure; basic input/output; strings; the C preprocessor; pointers; memory allocation; reading the command line.

SECOND YEAR, FIRST SEMESTER

SCS 202: Object Oriented Programming in Java I

Pre SCS 116 or SCS 103

Introduction to Java; primitive data types; variables and the assignment operator; expressions and arithmetic operators; Input/Output; Floating point input; if statement; logical operators; Loop control statements (do-while, for, while, switch); file 110; arrays (one-dimensional, two-dimensional); objects and classes; inheritance, encapsulation, and polymorphism.

SCS 204: Operating Systems

Pre SCS 101

Operating System Principles; multitasking systems; control and co-ordination of tasks; synchronization, mutual exclusion, sharing; memory management, virtual memory, segmentation, paging, protection; file systems; resource management; evaluation and prediction of performance; design and operation of operating systems in high level languages.

SECOND YEAR, SECOND SEMESTER

SCS 215: Unix Operating System

Pre-SCS 101

History of Unix; Unix structure; system resources and printing; shell; Text processing. File management and program development. AWK and shell programming; editors.

SCS 218: Object Oriented Programming in Java II

Pre SCS 202

Applets; Threads; Exceptions; Graphical User Interface (GUI) design-complete discussion of GUI design using AWT and JFC Swing components; Database connectivity; Servlets; Remote method invocation.

THIRD YEAR, FIRST SEMESTER

SCS 304: Data Structures and Algorithms

Pre: SCS 102

Deterministic finite automata (DFAs); NEAs; Equivalence of DFAs and NFAs; Regular expression; Pushdown automata (PDAs); Relationship of PDAs and context-free grammars; Properties of context-free grammars; Turing machine; No-deterministic Turing machines; Sets and Languages; Chomsky hierarchy.

SCS 335: Database Administration

Introduction; SQL server installation; creating databases; monitoring and managing database size; backing up and restoring databases; recovering the master database; managing and optimizing disk space; maintaining a warm standby server; configuring SQL mail; setting up jobs and defining alerts; implementing login, database and object security; monitoring the SQL server; managing transactional applications.

THIRD YEAR, SECOND SEMESTER

SCS 318: Design and Analysis of Algorithms

Pre SCS 301

Review of data structures and models of computation, Basic paradigms, e.g., greedy algorithms, divide and conquer strategies, dynamic programming, Graph algorithms, Algorithms for sorting searching, order statistics String matching, Sequence comparisons Geometric algorithms, Probabilistic algorithms. The classes and NP and the notion of NP-completeness.

SCS 329: Network Administration

Pre SCS 205

Popular network operating systems (Windows, Unix, Netware); configuring networks, including DNA, DHCP, outing; user management and access control; file systems, including striped and fault-tolerant file systems; sharing file systems via the network; disk configuration and administration, backup, and restore; managing printers and printer pools; managing processes, performance optimization and capacity planning; remote network access; web server installation and configuration; system management tools; trouble-shooting and maintenance; supporting Microsoft Windows Enterprise Technologies: design, implement and support and Windows operating system in a multi-domain enterprise environment; intemetworking with Microsoft TCP/IP on Microsoft Windows: set up, configure, use and support of

FOURTH YEAR, FIRST SEMESTER

SCS 401: Compiler Construction

Pre SCS 304

Compiler structures Lexical analysis, Syntax analysis, grammars, description of programming languages. Automatically constructed recognized error and error recovery. Semantic analysis. Semantic languages. Semantic processes. Intermediate languages. Optimization techniques and extendible compiler.

SCS 405: Compiler Construction Lab

Pre SCS 401

Students, working in small groups, will use one of the publicly available compiler construction tools to write a compiler for a small toy language or a subset commercial language

FOURTH YEAR, SECOND SEMESTER

SCS 417: Special Topics in Computer Science

Lectures and discussions on topics of current interest in computer science.

SCS 437: Information Systems Applications

Decision making process; Human Information Processing System; Decision Support Systems; Knowledge-based systems; artificial intelligence; Expert systems; executive support systems; manufacturing information systems; financial information systems.

2. BACHELOR OF EDUCATION (SCIENCE) WITH IT

1.0 INTRODUCTION

The degree programme of Bachelor of Education (Science) With IT is developed in line with the requirements of the country's secondary education system and the international standards on graduate teacher training curriculum. The programme seeks to produce graduate teachers who will have the requisite knowledge, skills and values relevant to not only be competent in the skills of delivery, but also be specialized in their areas of interest, ability and aspirations. In addition to Foundation Courses in Education, students will be expected to choose two other teaching subjects in the science domain as prescribed in the secondary school curriculum

2.0 PROGRAMME OBJECTIVES

The Bachelor of Education (Science) With IT degree programme is designed to produce graduate teachers well equipped with the requisite competencies and values of teaching specific subject areas as prescribed in the secondary education curriculum in Kenya. Specifically, the programme is planned in order to accomplish the following objectives:

- a) to prepare the student for an active career in all aspects of the profession of education
- b) to provide a comprehensive training background necessary for the students to become competent experts in the profession of education
- c) to enable the student identify the varied intellectual and special needs of the learner
- d) to develop the intellectual, professional and social characteristics that will enable the student to become responsible leaders in their schools and the community
- e) to develop the scientific character and capabilities of dealing with issues and problems in education and society
- f) to provide the students a rich basis for interest in further training and education in their areas of expertise, ability and interest

3.0 ADMISSION REQUIREMENTS

To be admitted to the programme, candidates must;

Satisfy the University entry requirements i.e. a minimum mean grade of C+

Or

Satisfy the University entry requirements i.e. a minimum mean grade of C+ and C+ in any two teaching Science subjects

Or

Have two Principal Passes at KACE/EAACE

Or

Have a Diploma in Education from a recognized educational institution

4.0 COURSE STRUCTURE AND DURATION

- 4.1 The degree shall normally take four (4) academic years of 8 semesters.
- 4.2 Courses shall be offered in units. A course unit is defined as that part of a subject described by a coherent syllabus and taught normally over a period of a semester. It is designated as a total of 42 hours of study in a semester. For this purpose one 1-hour lecture is equivalent to one 2-hour tutorial or 3-hour practical or any combination as may be approved by the Board of the School of Education.
- 4.3 Part-time students shall be allowed to take not less than 50% of the courses prescribed for the year.
- 4.4 All courses will be taught for a total of 42 contact hours, including examinations except Teaching Practice which will be undertaken for the durations when schools are in session.
- 4.5 Students shall be required to undertake teaching practice of a whole school term of 3 months at the end of 3rd year of study.

5.0 EXEMPTION FROM COURSES

Students may be exempted from some courses by Senate on recommendation of the School Board.

6.0 EXAMINATIONS REGULATIONS

University senate Examinations rules and regulations shall apply.

7.0 COURSE DISTRIBUTIONS

7.1 BACHELOR OF SCIENCE (EDUCATION) WITH IT

<u>FIRST YEAR, FIRST SEMESTER</u>			<u>UNITS</u>
SCS 101	Introduction to Computers	3	
SCS 114	Introduction to Spreadsheets and Databases	3	
EDU 101	Introduction to Special Education	3	
PSY 110	Introduction to Educational Psychology	3	
	Two courses for each of the two teaching subjects	12*	
	TOTAL:	24	
<u>FIRST YEAR, SECOND SEMESTER</u>			<u>UNITS</u>
SCS 103	Programming in Pascal	3	
SCS 112	Desktop Publishing	3	
EMA 111	Environmental Education	3	
EDF 111	History of Education	3	
	Two courses for each of the two teaching subjects	12	
	TOTAL:	24	
<u>SECOND YEAR, FIRST SEMESTER</u>			<u>UNITS</u>
SCS 203	Information Systems Analysis and Design	3	
SCS 207	Web Design and Publishing	3	
ECT 210	General Methods of Teaching	3	
EDF 210	Philosophy of Education	3	
	Two courses for each of the two teaching subjects	12	
	TOTAL:	24	

<u>SECOND YEAR, SECOND SEMESTER</u>		<u>UNITS</u>
SCS 212	Database Systems	3
SCS 214	Management of Information Systems	3
ECT 211	Educational Media and Resources	3
ECT 212	Curriculum Development	3
	Two courses for each of the two teaching subjects	12
	TOTAL:	24

*See the list of courses in section 8.2

<u>THIRD YEAR, FIRST SEMESTER</u>		<u>UNITS</u>
SCS 306	Internet Computing	3
SCS 310	Multimedia and Graphics	3
PSY 310	Human Growth and Development	3
	Special Methods in two teaching subjects	6
	Two courses for each of the two teaching subjects	12
	TOTAL:	27

<u>THIRD YEAR, SECOND SEMESTER</u>		<u>UNITS</u>
SCS 322	Electronic Commerce	3
SCS 324	Statistical Analysis with SPSS	3
ECT 360	Educational Technology	3
PSY 311	Human Behaviour and Learning	3
	Two courses for each of the two teaching subjects	12
	TOTAL:	23

<u>FOURTH YEAR, FIRST SEMESTER</u>		<u>UNITS</u>
SCS 409	IT and Society	3
SCS 436	Internal Controls and Security Issues	3
EMA 411	Educational Administration and Management	3
EDF 410	Sociology and Education and Comparative Education	3
PSY 410	Educational Tests and Measurement	2

Two courses for each of the two teaching subjects	12
TOTAL:	24

<u>FOURTH YEAR, SECOND SEMESTER</u>		<u>UNITS</u>
SCS 416	Human Computer Interaction	3
SCS 427	Social and Professional Issues in Computing	3
EMA 412	Planning and Economics of Education	3
EDF 390*	Teaching Practice	6
PSY 411	Guidance and Counseling	2
	Two courses for each of the two teaching subjects	12
TOTAL:		23

* Teaching Practice will be offered after completion of fourth year second semester courses. Therefore its not part of the load in fourth year second semester.

COURSE DESCRIPTION

A. COMMON COURSES

FIRST YEAR, FIRST SEMESTER COURSES

EDU 110: Introduction to Special Needs Education

Definition of Education and Special Needs Education; historical development of Special Education; Special and Regular Education; categorization of education, special education and society, sociology of special education and characteristics of various exceptionalities; causes and prevalence of handicapping conditions on each exceptional case.

SCS 101: Introduction to Computer

Historical background of computers, components of a computer system, basic computer organization, computer software, operating systems with hands on experience with the operating systems currently in use at the University, Hands on experience with typical word processors.

SCS 114: Introduction to Spreadsheets and Databases

Database Types: Advantages and disadvantages; file types creating and modifying fields in database. Data entry and validation checks. Importing and exporting tables. Data handling: Add, view edit, sort or filter data in a database creating using view files. SQL and query files; creating, saving, modifying query files. Forms: creation and application. Data entry and viewing through forms: Form within a form. Report: Creating, customizing and printing of reports and mailing labels (mailing lists). Designing and Running of Macros.

PSY 110: Introduction to Educational Psychology

Introduction; Personality theories; personality development; Personality assessment; Biological foundations of human behavior: The nervous system, the learning process, sensation, perception, consciousness, attention and interest, emotion and aggression, frustration, conflict, anxiety, stress and stress management, memory and forgetting; Types of exceptionalities: Learning disabled, minimal brain damage, social-emotional problems, mentally challenged, gifted and talented, sensory handicap, multiply handicapped.

FIRST YEAR, SECOND SEMESTER COURSES

EDF 111: History of Education

Development of education throughout history; Education in classical times; Education during the middle ages; The emergence of states in the 17th and 18th centuries and its influence upon the development of education; Education in the 19th and 20th centuries with historical study of the ideas of selected important educational thinkers; History of education in Kenya: patterns, problems and developments from the pre-colonial times to the present.

SCS 103: Programming in Pascal

Notations and fundamental concepts, data type and declaration, statement, expression and assignments, simple input and output, basic control structures, procedures and function, arrays, records, sets, files, pointers:- pointer concept, programming a stock, non linear structures, storage tailoring (3 credit hours).

SCS 112: Desktop Publishing

Basic concepts of desktop Publishing Packages. Crating and Publications; The toolbox, working with pallets and setting preferences: Formatting texts: Working with graphs and managing windows; Constructing a publication and using the dictionary: Indexing; creating tables of contents. Colour management Systems.

EMA 111: Environmental Education

Environmental Education perspectives. The earth – its environmental systems and resources. Environmental management, Demography and the environment; Human settlements. Society, culture and environmental awareness. Technology and environment; Development and environment; Legal aspects of environment; Chemicals and environment; the teaching of environmental Education in the 8.4.4 education system.

SECOND YEAR, FIRST SEMESTER COURSES

ECT 210: General Methods of Teaching

The nature of teaching and learning; a systems' approach to teaching; teaching methods and strategies; educational aims, goals and objectives; planning for instruction; communication and interaction in the classroom; providing for individual differences; motivation and sustenance of learners' attention and evaluation of learning outcomes.

EDF 210: Philosophy of Education

An introduction to philosophy as a discipline of knowledge: the origin, purpose and development of educational philosophy of education as a distinct discipline of knowledge; The content of education; Education and knowledge, education and values; The method of education; The creative and social dimensions of education; The concept of teaching and learning; The teaching of social education and ethics.

SCS 203: Information Systems Analysis and Design

Conducting feasibility studies, selecting the team, terms of reference. Technical, cost sizing of equipment and man power, operational feasibility, Implicating for people on organization, participative systems design, management of innovation, Economic feasibility cost/benefit and capital investment analysis, estimation of cost, economics of information, valuation of benefits, the feasibility report.

SCS 207: Web Design and Publishing

Internet and the world web (WWW) Browsing and searching techniques; the Internet as a research tool. Search engines; Introduction to Hypertext Mark Up language (HTTP); Web design, hosting and development; Intranet concept: evolution, benefits and challenges.

SECOND YEAR, SECOND SEMESTER COURSES

ECT 211: Educational Media and Resources

Communication Models and Learning; barriers to effective communication and how to overcome them; visual communication in learning; verbal and non-verbal communication; introduction to the range of media in teaching and learning; using educational radio and television broadcasts in schools; producing teaching and learning materials in schools; selection and use of print media; management of school multi-media center; evaluation of educational media; future developments in educational media and resources.

ECT 212: Curriculum Development

Definitions and concepts; the meaning of educational goals and purposes of education; curriculum as a field of study and as a programme of instruction; curriculum development process; models of curriculum development; patterns of curriculum organization, stages of curriculum development; principles of curriculum implementation; the process of curriculum implementation; curriculum evaluation; the teacher and the curriculum; curriculum development in Kenya; issues in curriculum development in Kenya; Relevance, strategies and processes; issues in teacher education and teaching profession: universal primary education.

SCS 212: Database Systems

Database systems; Data modeling an relational model; Database query languages; Relational database design; transaction processing: Distributed database; physical data base design.

SCS 214: Management Information Systems

Introduction to management information systems hardware and soft ware issues, application software packages, database management systems, ethical and security issues, systems analysis and design.

THIRD YEAR, FIEST SEMESTER COURSES

ECT 311: Special Methods of Teaching Mathematics

Introduction to Mathematics Education; philosophy and foundations of mathematics education; general goals and objectives of mathematics; instructional theories of teaching and learning mathematics; strategies of teaching mathematics, secondary school mathematics curriculum in Kenya; planning for instruction; instructional resources; teaching selected topics and problem solving procedures; trends and issues in teaching mathematics; assessment in mathematics.

ECT 332: Special Methods of Teaching Biology

An overview of Biology Education; Philosophy of Biology education; aims and objectives; secondary school Biology; preparation of scheme of works, lesson plan and record of work covered; preparation, selection and use of resource materials : realia, models, graphics mock-ups, management of Biology laboratory; evaluation.

ECT 333: Special Methods of Teaching Chemistry

An overview of Chemistry education; philosophy of Chemistry education; aims and objectives; secondary school Chemistry syllabus; strategies in the teaching and learning of Chemistry; preparations of the scheme of work, lesson plan and record of word covered; preparation, selection and use of resource materials : realia, models, graphics; management of the Chemistry laboratory; evaluation.

ECT 335: Special Methods of Teaching Physics

An overview of Physics Education; Physics of Biology education; aims and objectives; secondary school Physics syllabus; strategies in the teaching and learning of Physics; preparations of the scheme of work, lesson plan and record of work covered; preparation, selection and use of resource materials : realia, models, graphics; management of the Physics laboratory; evaluation.

PSY 310: Human Growth and Development

Introduction: Historical overview, Theories about the child, methods of studying children; Pre-natal period: Genetic counseling and phenotype, prenatal growth and development, nature/nurture concept; The birth process: Labour, delivery, dangers; Infancy; Early childhood; Mid childhood; Late childhood; Adolescence; Moral development Adulthood.

SCS 306: Internet Computing

History and evaluation of the Internet, basic tools of Internet access, emails, ftp, Telnet, news, anarchie, WWW Basic Internet Protocols, TCP/IP, SMTP, ftp, http, routers, algorithms and protocols for routing, Internet programming, Unix systems calls, socket programming, languages for the Internet, HTML, XML, Java scripts, perl, applications, network information discovery and retrieval, web servers, robots and search engines, security issues, firewalls, encryption and protocols problems with the Internet, technical issues. Future of the internet, NGI, Internet-II, IP 6 etc.

SCS 310: Multimedia Graphics

Fundamentals of design and Visualization; Creating illustrations: Image creation: Creating Editing and optimizing graphics for commercial design; 2 Dimensional animations, 3D graphics Multi media.

THIRD YEAR, SECOND SEMESTER

ECT 360: Educational Technology

This unit is divided into two parts, both of which are practical activities for the students in teaching and production of resource materials; The first part covers Educational media practicals: (How to use the chalkboard, graphics, construction of three-dimensional materials, operation of

audio-visual equipment, preparation of audio programmes) and the second part covers Microteaching; (Lesson preparation, preparation of audio visual media for the lesson; lesson presentation; skills application set induction, lecturing, reinforcement, stimulus variation, questioning, providing for learner participation, feed back, closure).

ECT 390: Teaching Practice

This is a practical course for students of education. It provides opportunity for the students to practice teaching principles in a real classroom and school environment. Each student is attached for a period of three months to a secondary school and relevant institute of technology or national polytechnic where they work under the guidance and co-operating teacher and the university supervisor. During this period of attachment to the education institution each student is inducted in the teaching profession and guided and graded in two teaching subjects.

PSY 311: Human Behaviour and Learning

Definition; Determinants of human behavior; Origin of group membership Group pressure; Power and influence; Group performance; Group norms and cohesiveness; Attitudes and stereotypes; Motivation; Roles and conflicts in groups; Theories of learning; Learning process; Conditions of learning; Factors affecting learning.

SCS 322: Electronic Commerce

E-commerce, benefits and shortcomings, business to business commerce, business to consumer commerce. Building blocks of electronic commerce. Applications internet and Network protocols. Electronic payment systems. Security transactions. Review of cryptographic tools, secure financial transactions. Payment transactions and standards, Smart card and e-cash technologies. Authentication, signatures, observers, Anonymity, privacy, trace ability. Key certification, Management and Escrow, technologies for building e-commerce applications, distributed objects, object quest brokers, and object oriented application frameworks. Some applications: supply chain management, Internet auctions and remote banking.

SCS 324: Statistical Analysis with SPSS

Introduction; File management; File systems, creating new files, opening saved files, saving files, Printing, editing: cut and paste, copy and paste, editing options: Data manipulation: Variable definition, inserting variables, inserting cases, variable transformation; Statistics: summarize, custom tables, comparing means, general linear model, correlation and regression, data reduction, reliability analysis, non-parametric tests. Graphs, Bar charts, line graphs, pie chart, box plots, error bars, scatter plots, histograms, p-p plot, time series.

FOURTH YEAR, FIRST SEMESTER COURSES

EDF 410: Sociology of Education and Comparative Education

Origins of Evolution of sociology and sociology of Education; Sociology as a discipline of knowledge, its branches and methods of study, the relationship between sociology and other Social Sciences; sociological theories and their relevance to Education; Education and the Socialization process; Education and Culture; Social stratification and Education; Education opportunity and Equality; Education and Politics; Education and Gender development; Education

and development; Education deviance and transformation; Sociological research in Education settings; Comparative Education as a discipline encompassing the definition; purpose; significance; historical development and methodological approaches used; Comparative study of systems of education in Britain; France; Israel; South Africa; Cameroon and East African countries; Contemporary issues in education such as urbanization, higher education, technical education; teacher education; special education; science education; inspection and supervisory practices; multilingualism; dependence and interdependence in education.

EMA 411: Educational Administration and Management

Introduction to Educational Administration: definition of administration, management, educational application of administration and management; Theories of administration: scientific management including bureaucracy, human relations, behavioral approach, systems approach; legal basis of education in Kenya: party manifestos, the construction, the Education Acts and subsequent legal notices, presidential Pronouncements; School organizations: registration categorization, management, roles of Board of Committees; Instructional management; Co-ordination of curricular activities; Selection and acquisition of instructional materials and equipment; Maintenance of school financial management: principles of book-keeping, accounting journals, sales, purchases, cash receipts and payments, ledgers inventories, petty cash and bank reconciliation, sources of school funds, estimates and budgets, spending and accounting for school finances – authority to spend legal guideline – school accounts, auditing; Teachers' Association.

SCS 409: IT and Society

History of computing, social context of computing, methods and tools of analysis, professional and ethical responsibilities, the electronic community, the changing nature of technological risks, the information economy, risks and liabilities of safety-critical systems, intellectual property, privacy and civil liberties, pornography and censorship, social implications of the internet, computer crime, economic issues in computing, philosophical foundations of ethics.

PSY 410: Educational Tests & Measurement

Introduction; Educational objectives; Types of tests; Test construction; Test specification; Item analysis; Reliability and validity; scaling; Test administration; scoring and interpretation; Introduction; Organization of data; Graphs: Measures of central tendency; Measures of dispersion; standard scores; Area under the normal curve; correlation and regression.

SCS 436: Internal Controls and Security Issues

Controls on data and information: Input controls, Processing controls, output controls : Internal Security: Protection against fraud: computer crimes, computer viruses: Security measures: Information systems audit.

FOURTH YEAR, SECOND SEMESTER COURSES

SCS 416: Human-Computer Interaction (HCL)

The Principles of HCL, modeling user, interaction, window management system design, help systems, evaluation techniques, and computer supported collaborative work.

SCS 427: Social and Professional Issues in Computing

History of computing, social context of computing, methods and tools of analysis, professional and ethical responsibilities, risks and liabilities of safety-critical systems, intellectual property, privacy and civil liberties, social implications of the internet, computer crime, economic issues in computing philosophical foundations of ethics.

PAC 412: Planning and Economics of Education

Educational Planning; History and rationale of Educational planning; Social and psychological factors in educational planning; General problems of educational planning in and outside Kenya; Methodologies of educational planning. Planning for changes in the educational system; Administrative factors and educational planning; Economics of education; Leading economic issues of basic concern and their relevance to Kenya; Principles of economics of education and planning: micro-economics of education, macro-economics of education and socio-economic development.

PSY 411: Guidance and Counseling

Definition: Origin and philosophy; Theories; Skills and techniques; processes; Areas and challenges; Characteristics; Counseling models; Ethical standards; Counseling exceptional populations; current issues; Guidance programmes and services; Functions of Counseling.

B. TEACHING SUBJECTS

MATHEMATICS

FIRST YEAR FIRST SEMESTER

SMA 100: Basic Mathematics

Series: Arithmetic and geometric series. Systems of linear equations. Sets: operation on set. Venn diagrams. Trigonometric functions, their graphs and inverses, conversions from degrees to radians and vice versa. Addition, multiple angle and sectors formulae, trigonometric identities and equations, sine and cosine rule, standard trigonometric formulae. Algebra: Surd, logarithms and indices, equations and inequalities. Remainder theorem and its application. Permutations and combination. Binomial theorem and its geometric representations, complex numbers modulus, arguments, de Moivre's theorem, applications. Roots of complex numbers: Hyperbolic function: properties, graphs.

SMA 101: Analytical Geometry

The straight line: Equations of a straight line; gradient of a straight line.

Circle: equation of a circle radius r and centre at the origin and centre at (h,k) .

Conic sections: Parabola, ellipse and hyperbola.

Polar coordinates: Relation between vector polar and polar coordinates; graphs of polar equations, polar equations of conic sections.

Parametric equation of lines, circles, parabolas, ellipse and hyperbolas.

FIRST YEAR SECOND SEMESTER

SMA 102: Calculus I

Limits of functions, continuity, and uniform, continuity. Differentiability of functions properties of derivatives: sums, product, quotients, chain rule-algebraic, logarithmic trigonometric, implicit differentiation. Higher order derivatives: Small changes, rates of change, maxima, minima. Equations of tangent, and normals, kinematic integration, introduction to ant derivatives and their applications.

SMA 103: Linear Algebra I

Vectors and scalars: algebraic and geometric properties in \mathcal{R}^3 , magnitude and directions and applications and applications such as force, displacement, velocity and rotation. Operations: On vectors such as addition, scalar multiplication, dot and cross products, and linear combination, vector proof of theorems in geometry. Extension to \mathcal{R}^n : scalar products, formulae for length and angle, Schwartz and triangular inequalities, and planes and lines in \mathcal{R}^3 . Vector space over \mathcal{R} : Subspace, spanning sets, linear independence, bases and dimension, direct sums and intersection of subspace, linear mapping and their matrices with respect to the standard basis, range and null space, nullity and echelon form, rotations and reflections in \mathcal{R}^2 and \mathcal{R}^3 , and application to linear equations, matrix. Multiplication, inverse mappings and their matrices.

SMA 104: Descriptive Statistics

Nature of Statistics: Use of statistics; type of data; sources of data. Methods of data collection. Exploratory data analysis; data displays, charts and diagrams, frequency distributions; tables; graphical displays, scatter plots, frequency graphs. Summary statistics; measure of location and dispersion, skewness and kurtosis. Correlation: linear models. Index numbers. Elements of time series.

SMA 105: Introduction to Probability Theory

Probability: axioms of probability, conditional probability and independence, Bayes theorem. Random variables and probability distributions; the probability distribution function; distribution of a function of random variables. Expectations and moment generating functions. Standard probability distributions: uniform, exponential, normal, Bernoulli, binomial, geometric, negative binomial, hypergeometric, Poisson; the Poisson and normal approximation to the binomial.

SECOND YEAR FIRST SEMESTER

SMA 200: Calculus II

Integration: techniques of integration, definite integrals. Fundamental theorem of Calculus. Applications: areas under curve, length of an arc, plane and surface areas, volumes of solids of revolutions. Improper integral. **Pre-requisite: Calculus I.** The mean value theorem. Indeterminate Forms and L Hospital's Rule. Extending the mean value Theorem to Taylor's Formular. Estimating Approximation Errors. Quadrate Approximations. Rolle's theorem Lagrange's theorem. Applications infinite series; convergence tests. Integrals and their convergence.

SMA 201: Linear Algebra II

Field axioms. Vector spaces over an arbitrary field. Linear mapping and their matrices with respect to an arbitrary basis, the change of basis. Conjugation of eigenvectors theorem. Invariant subspaces. Quadratic forms.

SECOND YEAR SECOND SEMESTER

SMA 202: Vector Analysis

Vector Algebra: Scalars and vectors; types of vectors; addition and subtraction; multiplication and division by a scalar; position vector of point of division, scalar (or dot) product; vector (or cross) product scalar triple product; vector triple product; vector product of vectors; reciprocal vector triads; applications of vector algebra. Vector Calculus: differential vector calculus; applications of differential geometry and mechanics; integral calculus; Riemann, line, vector line, double, surface and volume. Gradient of a scalar function; Divergence of a vector; curl of a vector. Stoke's and Green's theorems: orthogonal curvilinear coordinates; contra variance and covariance.

SMA 205: Numerical Analysis I

Error analysis: Computer representation of numbers; rounding errors in floating point arithmetic; forward and backward analysis; extended arithmetic, statistical error bounds; matrix norms; rounding errors in matrix products.

Solution of linear equations. Elimination methods; Gauss method; partial and full pivoting, Jordan's method. Triangular decomposing methods; Doolittle method, Croute's method, and Cholesky's method for symmetric matrices. Ill-conditioned system.

Iterative methods: Gauss - Jacobi's method; Gauss - Seidel method; Successive over relaxation (S.O.R). Practical aspect of convergence. Convergence of Gauss - Jacobi and Gauss-Seidel methods. Convergence of (S.O.R). Solution of non-linear equations: Non-linear equations in single variable of the form $f(x) = 0$. Bracketing methods; fixed - point methods - fixed point, problems; rates of convergence the fixed point algorithms. Secant and Newton's methods.

SMA 208: Analysis

Theory of sets, Real numbers - field structure and order, Bounded and unbounded sets, suprema and infima, Completeness in the set of real numbers, functions and relations; Limits of functions; Types of discontinuities; Open sets; Closed sets.

SMA 209: Numerical Analysis II

Multipoint iterative formulae.

Newton's method in 2 variables, 3 variables; Improved Newton's method, roots. Zeros of polynomials, divided difference, Taylor's, Lagrange's and Newton's method.

Interpolation: Polynomial interpolation; Discrete least squares approximation. Orthogonal polynomials and least squares approximations. Rational approximation of functions. The Fourier approximation, Construction of minimax rational polynomial approximations.

SMA 210: Probability And Distribution Theory I

Review of probability. Special continuous distributions: Gamma, chi-square, Weibull, beta, Cauchy. Bivariate probability distributions; The joint probability law, marginal and conditional distributions, stochastic independence, conditional expectations and regression. The Bivariate normal distribution. Joint and marginal distributions of more than two random variables.

Distribution of functions of two or more random variables; The Distribution function technique, moment generating function technique, variable transformation technique.

SMA 211: Probability and Distribution Theory II

Sampling distribution; population and samples. The sample mean; from infinite and finite populations, from a normal population.

Laws of large numbers and the central limit theorem. The chi-square distribution; some special characteristics, use of tables. Other sample statistics; the sample variance, a sample population, the correlation coefficient, simulated random sampling, Random number tables. The T – distribution and F – distribution; special characteristics.

THIRD YEAR FIRST SEMESTER

SMA 300: Real Analysis I

Uniform continuity: Countable sets

Sequences – Limits point of a sequence, convergence,; Limit superior and limit inferior, monotonic sequence; Cauchy's general principle of convergence; series with positive terms, partial sums, tests of convergence,; comparison test, Cauchy's root test; D'Alembert's ratio test and integral test. Series with alternate terms, absolute and conditional convergences.

Metric Spaces – Definition and examples. Topology on metric spaces, Riemann Integrals, Exponential, trigonometric and logarithmic functions.

SMA 301: Ordinary Differential Equations I

First order equation and applications, second order equations; Homogenous equations with constant coefficients; Equations with variable coefficients; non-inverse differential operators; Applications.

THIRD YEAR SECOND SEMESTER

SMA 303: Complex Analysis I

The Complex plane; Basic topological concepts; series; functions of complex variables, limits and continuity. Connected spaces; Regions in \mathbb{C} ; Differentiability of complex functions; Holomorphic functions, angle-preserving mappings, Biholomorphic mappings. Modes of convergence; Power series; Exponential and trigonometric functions; Polar co-ordinates, roots of unity. Logarithmic functions. Integration over real intervals, path integral, primitives; The

Cauchy's Integral Theorem and Cauchy's integral formula; Power series development of holomorphic functions. Cauchy – Taylor's representation theorems.

SMA 304: Group Theory I

Conjugates In a group. Normal subgroups. Quotient subgroups. Homomorphism and isomorphism: The Kernel of a homomorphism and for isomorphism theorem. Simple and permutation groups. Even and odd permutation. Symmetric and alternatory groups. Groups acting on a set. Partition of a set into orbits. Statistics of an element. Rebtor between coordinator of an orbit and the index of the statistics. The number or orbits. Burnade's formula. Conjugacy classes. Normalises of an element. The centre of a group.

SMA 305: Numerical Analysis III

The Algebraic Eigenvalue problem: The eigenvalue: properties of eigenvalues and eign – vectors - similar matrices. Properties of real symmetric matrices – diagonalisation theorem, quadratic forms. Power method: theory of the method, origin shifts, deflation with order reduction: The symmetric eigenvalue problem. Reduction to tri-diagonal form; plane rotation matrices; Householder's orthogonal transformation matrices. Householder's method of reducing A to tri diagonal form: Given's methods of reducing. A to tri diagonal form. Calculation of the eigenvectors: method of inverse iteration. The non-symmetric eigenvalue problem: reduction to Hessenberg form; the Householder method. The QR algorithm; application to upper Hessenberg matrices.

SMA 306: Numerical Analysis IV

Errors in Eigenvalues and Eigenvectors:

Gerschgorin's Theorems; Nearly diagonal matrices; eigenvalues of nearly diagonal matrices; modified Gerchgarin discs; eigenvalues of a perturbed matrices; eigenvalues of a perturbed matrix; a condition number for the eigenvalue problem; per turbation of simple eigenvalue. Perturbation of eigenvectors. Transformation and properties of condition numbers. Numerical differentiation of data. Numerical differentiation of functions: finite difference Approximation; backward-differences, forward-difference; central-difference Error bounds. Three point and five

point formulas approximations to the First derivatives. Extrapolations. Richardson's extrapolation procedure Applications.

SMA 308: Fluid Mechanics

Fluid and their Properties. Continuum model. Hydrostatics to applications.

Rinomatics of fluid flow. Introductory the modynamics. Equations of continuity; conservation of mass and stream function for 2 – dimensional flows and stokes strom function for Axi-symmetric flows. Euler's equation Bernauli's and its Application. Irrotational flow.

SMA 309: Real Analysis II

Complete metric spaces; pre-compactness, compactness in metric spaces, continuity in metric spaces, equicontinuous functions, sequences and series of functions, pointwise and uniform convergence; Riemann – Stieltjes integral; Functions of bounded variation, Total variation, Nested intervals; Cantor's intersection theoem.

SMA 312: Operation Research I

Formulation of linear models; convex analysis in E^n Elasticity; Duality; Graph fundamentals; Classical transportation model.

SMA 314: Theory of Estimation

Consistent estimators; Unbiased estimators, efficient estimators; Likelihood function; Crammer-Rao inequality, Bhattacharya inequality, Regular estimator; Sufficient estimators, Rao-Blachwell inequality; Distribution of efficient estimators method of minimum variance; method of moments' Method of minimum chi-square methods of least squares; Interval estimation; confident interval for the mean and the variance of a normal distribution; Confident interval for large samples and sufficient estimators; Shortage average, confidence intervals Bayesian Estimators.

FOURTH YEAR FIRST SEMESTER**SMA 402: Measure Theory**

Lebesque measure on the real line; Outer lebesque measure; Measurable Functions; Lebesque integral monotone convergence theorem; Fatou's Lemma; Lebesque Dominated Convergence Theorem; Comparison between lebesque and Riemann integral highlighted.

SMA 403: Topology I

Topological spaces; definition and examples; accumulation points; Closed sets, closure, interior and exterior of a set; neighbourhood and system, coarser and finer topologies equivalent definitions of topologies, based of topology; Continuity and topological equivalence, continuous functions, open and closed maps, homeomorphic spaces, topological properties; Formation on New spaces, relative topology, induced topology; identification topological product adjust ion spaces; Separation axioms, T-spaces, Haudorff spaces, regular spaces, normal spaces, Urysohn's Lemma, Category and separability; Dense sets, nowhere dense sets, sets of the first category and of the second, perfectly separable space, axiom of accountability.

FOURTH YEAR SECOND SEMESTER

SMA 405: Partial Differential Equation I

Surface and curves in three dimensions; Simultaneous differential equations of first order methods of solution of orthogonal trajectories of systems of curves on a surface. Pfaffian differential equations, Linear, semi-linear, quasi-linear equations of the first order; Integral surfaces passing through a given curve; Use of methods of Cauchy, Charpit and Jacobi in solving non-linear partial differential equation of the first order.

SMA 406 Numerical Analysis V

Systems of linear equations: directed and iterated methods. Numerical solutions of ordinary differential equation (initial and boundary value problems); Least squares approximation; Spline approximations. Tchebychev's series and orthogonal polynomials; Applications of approximation to Gaussian and related quadrature; Numerical Matrix Inversion; Eigenvalues and Eigen Vectors of Matrices.

SMA 409: Differential Geometry

Plain curves: Frenet frame and equation, space and convex, fundamental existence and uniqueness theorem (no proof required); theory of surface; fundamental forms, curves of surfaces; curvatures, development surface; Gauss and Codazzi-Minardi equation.

SMA 411: Partial Differential Equation II

Characteristics of the Linear and semi linear partial differential equation of the second order, boundary value and initial value problems; Equation of the hyperbolic type; Riemann's methods; The equation of wave motion; Equation of elliptic type; The heat equations.

SMA 414: Fourier Analysis

Introduction to Fourier expansion on a general interval; half-range expansions; Complex forms orthogonal systems of functions on a compact interval; Bessel's inequality; Approximation theorem Parseval's equality (identity); Riemman-Lebesgue Lemma Dirichlet-Jordan convergence. Applications to infinite series; Ferjer's sums, Ferjer's theorem for convergence of Fourier series; Weierstrass' approximation theorem; Gibb's phenomenon. Differentiation and

integral of Fourier series; Physical application of the theory of Fourier integral of functions satisfying Dirichlet's condition on (a,b); Fourier inversion sine and cosine transforms simple applications.

SMA 417: Group Theory II

Class formula: finite group, p-sub-groups, Sylow subgroups and theorems. Non-triviality of the centre of a p-group. Upper and lower central series. Solvable groups. Nilpotent groups. Composition series and Jordan-Holder theorem. Abelian groups. Direct sums and products. Structure theorem for finitely generated Abelian groups.

SMA 419: Numerical Analysis VI

Parabolic partial differential equations in one and two space dimensions:

Derivation of exact finite difference formula; explicitly formulae; implicit formulae; solution of tridiagonal systems; convergence; stability. Elliptic partial differential equations in two dimensions: Laplace equation in a square. The Neumann problem; mixed boundary conditions; the solution of elliptic difference equation; direct factorisation methods; successive over-relaxation (S.O.R); eigenvalue problems. Hyperbolic partial differential equations in one and two space dimension: explicit finite difference formulae; implicit finite difference schemes; stability of the schemes. Finite elements: the Galerkin method; introduction; elliptic partial differential equations; Galerkin method with different test and trial functions.

SMA 421: Test of Hypothesis

Simple and composite hypothesis; Concepts of a statistical test, two kinds of error, power of test; Neyman-Pearson criterion for testing simple hypothesis; Most powerful and uniformly most powerful test; Small sample and large sample test. Test for correlation and regression coefficients; confidence bounds.

BOTANY

FIRST YEAR, FIRST SEMESTER

SBT 101: Plant Structure and Function

Cell structure; introduction to tissue systems; morphology and anatomy of angiosperm root, stem and leaf; primary and secondary growth of plants; structure of flower, fruit and seed; ecological anatomy of plant functions at molecular, cellular and organismic level; seed dormancy and germination; diffusion and osmosis; soil-water-plant relationships; material nutrition; photosynthesis and respiration.

SBT 103: Introductory Plant Systematics

Introduction to biosystematics methods; major metabolic specialization; structures used in plants systematics; herbarium techniques; methods of plants collection, recording, pressing and arrangement of reference types; systematic of groups of importance in ecology and to biological science; principles, problems and modern methods of taxonomy.

FIRST YEAR, SECOND SEMESTER

SBT 102: Survey of the Plant Kingdom

A survey in the plant kingdom from the prokaryotes to the eukaryotes; the structure, development, physiology and classification of major plant groups: algae, fungi, bacteria, bryophytes, pteridophytes, gymnosperms and angiosperms stressing their evolutionary affinities, relationships and economic importance.

SBT 104: Fundamentals of Ecology and Conservation

Organisms and their environment; biogeochemical cycles; interaction between physical environment and distribution, abundance of species and ecosystem; properties of populations, communities and ecosystems of East Africa and the World; ecological impact analysis, nature reserve selection; species conservation and management; biological variations, measurements and implication.

SECOND YEAR, FIRST SEMESTER

SBT 201: Gymnosperm and Angiosperm Taxonomy

Significance of taxonomy and its relationships with other botanical disciplines; history of classification and the concept of artificial and natural and natural classification; role of fossil angiosperms and gymnosperms to taxonomy; hierarchy of taxonomy ranks of the units of classification; the concept of character; sources of taxonomic characters; intraspecific variation and isolation; nomenclature; herbarium and its relevance/role in plant taxonomy survey of selected families from the flora of East Africa.

SBT 202: Plant Mineral Nutrition

Origin and chemistry of plant nutrients; mechanisms of nutrient absorption and factors influencing uptake of an individual nutrient; nutrient deficiency symptoms in crop plants; nitrogen, sulphur, phosphorus, calcium, potassium, magnesium and trace elements, their sources and forms; soil fertility assessment including pot and nutrient culture plants; field soil analysis; fertilizer types, manufacture, physical and chemical properties; chemical behavior of common fertilizer under various soil conditions; fertilizers blending and responses.

SECOND YEAR, SECOND SEMESTER

SBT 203: Economic Botany

Plants useful to human; introduction to the major exotic and indigenous crop plants; reproduction in angiosperms; origin of chief crop plants in Kenya; potential of plant kingdom for new economic species; weed and their control; introduction to the biology of fungi, bacteria and viruses, in relation to plant pathology.

SBT 204: Introductory Biochemistry and Genetics

The genetic materials, DNA and RNA; chromosome structure; mitosis and meiosis; Mendelian genetics; sex determination; gene concept; protein synthesis; plant cells, tissues and organs; aqueous and colloidal systems; chemistry and occurrence of carbohydrates; lipids and amino acids in plants; classification and nature of proteins; introduction to enzymes and co-enzymes.

THIRD YEAR, FIRST SEMESTER

SBT 301: Plant Growth and Development

Growth measurement and kinetics; cell growth mechanisms; organization of shoot and root growth; developmental anatomy and phyllotaxy; determinate and indeterminate growth;

juvenility and senescence; the discovery; chemistry, metabolism, function, interaction, transport and economic importance of plant hormones; cell, tissue and organ culture; their application and relevance; plant responses to the environment; dormancy, flowering and phytochrome involvements; growth movements.

SBT 302: General Genetics

Autosomal linkage and chromosomal mapping; the linear order of genes interference; chromosomal variation; deletions, inversions duplications, translocation, aneuploidy and polyploidy; gene interactions; chemical bases of heredity; mutations; mutagens; detection of mutations; gene regulation; the operon concept; extra-chromosomal inheritance; multiples, kinds of genetic variation; factors affecting genetic variation in natural populations; gene frequencies in populations; introductory quantitative genetics; fundamentals of evolution.

THIRD YEAR, SECOND SEMESTER

SBT 308: Ecophysiology

Water relations in plants; the ascent of sap and mineral elements; effects of water, salt, light and temperature stresses: on plant growth and development;; essentiality of mineral elements; uptake and transport of mineral nutrients; foliar nutrition and leaching; mineral metabolism – deficiencies; ecological and genetic aspects of mineral nutrition; plant response to the environment.

SBT 311: Cytogenesis

Role of mitosis and meiosis in heredity; mitotic cycle; condensation cycle and Mendel's first law; independent orientation of bivalents and Mendel's second law; segregation of chromosome, recombination and chiasmata; sex chromosomes and sex determination; their meiotic behavior, deletion, inversion, centric fusions and reciprocal translocations; aneuploidy and euploidy; B-chromosomes.

FOURTH YEAR, FIRST SEMESTER

SBT 401: Plant Biochemistry and Physiology

Metabolism and biosynthesis of carbohydrates, lipids, amino acids and proteins; nitrogen cycle; assimilation of organic and inorganic nitrogen by plants; nature and function of enzymes, coenzymes and vitamins; plant organic acids; respiration; photosynthesis.

SBT 402: Morphogenesis and Anatomy

Reproduction morphology; the male and female gametophytes; fertilization, endosperm development and applied embryology; organogenesis, development, differentiation and structure in the shoot and root apex; organization of plant tissues; abnormal plant growth and tissue culture studies of morphogenesis.

FOURTH YEAR, SECOND SEMESTER

SBT 410: Plant Pathology

History and importance of plant pathology; concepts and definitions of nature, cause and control of plant diseases; agents of infectious diseases, with emphasis on fungi and bacteria; non-infectious diseases and stage in the development of diseases; inoculation, infection, pathogenesis and symptoms; disease severity and assessment; epidemiology; effect of environment on plant diseases; variability in plant pathogens and disease physiology; enzymes and toxins susceptibility and resistance in plants; genetics of host-parasite interactions.

SBT 412: Phycology

Fine structure and classification of the algae; range of morphological forms and methods of reproduction and life cycles in major classes; evolutionary trends; habitat range, marine, fresh water and terrestrial; alga physiology, pigments, light absorption and photosynthesis; respiration and desiccation; natural products, their extraction and commercial value.

PHYSICS

FIRST YEAR, FIRST SEMESTER

SPH 101: Mechanics

Physical units and dimensions; rectilinear motion with constant acceleration; displacement and velocity time graphs. Basic dynamic equations of motions: Newton's first, second, and third laws of motion; friction and its physical applications. Work and energy, work-energy theorem;

law of conservation of linear momentum, impulse. Planar motion with constant acceleration; projectiles. Gravitational field and potential; law of universal gravitation. Introduction to satellite motion, Kepler's laws.

SPH 104: Thermal Physics

Temperature; thermal equilibrium; the zeroth law of thermodynamics; concepts of temperature, heat transfer processes: conduction, convection, radiation; calorimetry and specific heat capacity; latent heat and change of state; vapour pressures; quasi-static processes; work and heat; internal energy; general gas laws: Charles and Boyle's laws; introduction to kinetic theory.

FIRST YEAR, SECOND SEMESTER

SPH 102: Electricity and Magnetism I

Charge; Coulomb's law; electric field; electrostatic potential. Capacitors, capacitors in parallel and in series; electric current, magnetic fields; flux and flux density; magnetic flux density inside a long solenoid; electric current, magnetic fields; effect of a magnetic field on a moving charge; force on a current carrying conductor's force on a current carrying conductor; force between current carrying conductors; moving coil galvanometer; potential and electromotive force; Kirchhoff's law; Ohm's law; resistance, resistivity and its temperature coefficient: potential divider; basic principles of electromagnetic induction; transformers; cathode ray oscilloscope and its functions.

SPH 103: Optics

Geometrical Optics: Rectilinear propagation of light, shadows, eclipses. Reflection: diffuse and regular, laws of reflection images formed plane and curved mirrors. Refraction: laws of refraction, Fermat's principle, refractive indices, real and apparent depth. Thin lenses: lens formula, lens aberrations. The prism and dispersion. Optical instruments: the eye, the microscope, the telescope Physical Optics: Introduction of waves: refraction and Huygens principle, principle of superposition of waves, interferometer and diffraction, diffraction gratings. Plane EM waves, EM spectrum, polarization by: reflection, refraction, transmission plates, dichroism, and scattering. Introduction to optical activity.

SECOND YEAR, FIRST SEMESTER

SPH 201: Dynamics

Turning forces: couples, torque, static equilibrium, centre of gravity; rotational motion of rigid body about a fixed axis, moments of inertia. Conservation of angular momentum; rotational kinetic energy; equations of motion; Elastic and inelastic collisions; relative motion; inertial frames of reference; relative velocity; uniform relative translational motion; Galilean transformations; Fizeau and Michelson-Morley experiments, uniform rotating frames of reference; centrifugal, Coriolis forces.

SPH 202: Electricity and Magnetism II

Gauss' law and its application; capacitance and dielectrics; magnetic field and forces; circulating charges; electromagnetic induction; Lorentz force; torque on a current carrying coil; electric and magnetic moments; energy and dipole orientation; inductance, electromagnetic oscillations, resonance. Magnetic properties: paramagnetism, ferromagnetism and diamagnetism.

SECOND YEAR, SECOND SEMESTER

SPH 204: Oscillations and Waves

Periodic motion, simple harmonic motion: the basic equation, force and energy. Superposition of two harmonic motions, beats. Anharmonic oscillations. Damped oscillations. Forced oscillations, resonance. Concept of wave motion: standing waves, transverse and longitudinal waves, superposition of waves: phase and group velocity. Reflection and transmission of waves

at an interface. Elastic waves in solids, rods, springs and air. Sound waves in a column of gas, sources of sound, Doppler effect. Acoustics.

SPH 206: Empirical Ideas of Quantum Physics and Relativity

The atomic nature of matter, electrons. Photons: black body radiation, photoelectric effect, Compton effect, X-rays. Atomic physics: atomic models, Rutherford's scattering experiment; optical spectra, Franck-Hertz, Bohr's atomic model, quantization of angular momentum, Stern-Gerlach, electron spin. Wave-particle duality: De Broglie's hypothesis, electron scattering (Davisson-Germer experiment), Bragg's condition. Relativistic physics: universality of the speed of light (electrodynamics, Michelson-Morley), the mass-energy equivalence. Nuclear Physics: simple nuclear models, the binding energy curve, fission and fusion, radioactive decay.

THIRD YEAR, FIRST SEMESTER

SPH 302: Thermodynamics (prerequisite SPH 104)

First law of thermodynamics;; adiabatic work; equation of state of a gas; ideal gas; state diagrams, heat engines and the Carnot cycle; reversible and irreversibility; entropy and disorder. Thermodynamic potentials; free energy (Gibbs and Helmholtz) Maxwell thermodynamics relations; equilibrium between phases, Clausius-Clapeyron equation; Irreversible changes; the third law of thermodynamics.

SPH 313: Classical Mechanics (prerequisite SPH 201)

Newtonian Mechanics: Review of Newton's equations of motion; systems of particles; forces: gravitational, electro-magnetic, frictional, constraining, conservative; D'Alembert's principle. **Variational calculus;** calculus; Lagrangian formulation, constrained systems, symmetries and conserved quantities; application to rigid body motion. Hamiltonian formulation, symmetries and conserved quantities.

Relativistic Mechanics: Inertial frames, the principle of relativity, the postulates of Galilean space-time. The constancy of the speed of light, the postulates of special relativity, the Lorentz and Poincaré transformations. Lorentz contraction, time dilation, proper time, the twin paradox.

Energy and momentum conservation, applications in particle physics, the relativistic equations of motion.

THIRD YEAR, SECOND SEMESTER

SF11 301: Introduction to Solid State Physics.

Review of the structure of matter; atomic and molecular energies; types of bonds; repulsive and attractive forces; amorphous and crystalline solids; crystal structures; symmetry and plane directions; defects and crystal disorder. Band theory: conductors, insulators and semiconductors; p-n junctions. Thermal, electrical and mechanical properties of solids.

SPH 303: Quantum Mechanics I (prerequisite SF11 206)

Review of wave-particle duality, the double slit experiment, probabilistic interpretation. The free particle: wave function, wave packets, Fourier transform, the Schrodinger equation. Particle in a potential (onedimensional): time-dependent and time-independent Schrodinger equations, square well potentials, bound and scattering states, tunnelling, the harmonic oscillator. Linear operators, eigenvalues and eigenstates, expectation values, uncertainties, Heisenberg's uncertainty relation. The postulates of Quantum Mechanics.

FOURTH YEAR, FIRST SEMESTER

SF11 401: Solid State Physics

Crystal formation; free electron theory; lattice vibrations; Review of Fermi-Dirac, Bose-Einstein and Maxwell-Boltzmann statistics; periodic potentials; phonons; Schrodinger equation; energy levels; degeneracy; density of states. Review of specific heat; Einstein and Debye theories of specific heat. Magnetic properties: ferromagnetism; paramagnetism; diamagnetism. Nuclear magnetic resonance; super-. Conductivity.

SPH 410: Electrodynamics

Vector and scalar fields: electric (E) and magnetic (B) fields from point charge, charge distributions, currents in wires and current densities. Maxwell's equations in their integral form; displacement current. Vector operations: Divergence and Curl, Stoke's and Gauss's theorems. Maxwell's equations in differential form. Electromagnetic waves in vacuum: Transverse EM waves, relation between E and B, polarisation, the speed of light. Poynting vector: energy and momentum transport in EM fields. The magnetic vector potential A, relationship to E and B, retarded potentials and causality with specialrelativity. The generation of EM waves/fields: the Hertzian dipole, aerials and atoms as sources of EM radiation.

FOURTH YEAR, SECOND SEMESTER

SPH 402: Statistical Mechanics

Phase space; density of states; statistical distribution of systems of particles: microstates and macrostates; statistical weight; counting accessible states. The grand canonical ensemble; degrees of freedom in phase space, momentum-space and velocity-space; statistical thermodynamics: entropy, enthalpy and thermodynamic potentials; equilibrium of an isolated system; chemical potentials; equilibrium of a system in a heat bath: negative temperature. Probability distribution and partition function: Maxwell and Boltzmann, Bose-Einstein, Fermi-Dirac. Applications: paramagnetism, thermodynamics of black body radiation; Bose- Einstein condensation.

SPH 403: Quantum Mechanics II

Review of the postulates of quantum mechanics. Algebraic solution of the harmonic oscillator, the angular momentum algebra. Application: the hydrogen atom, electron spin, spin-orbit coupling. Perturbation theory: Riesz' variation principle, time-independent perturbation theory; the Schrodinger, Heisenberg and interaction pictures, time-dependent perturbation theory, application to optical transitions, selection rules. Many-particle systems: distinguishable and indistinguishable particles, bosons and fermions, the Helium atom or other applications.

CHEMISTRY

FIRST YEAR, FIRST SEMESTER

SCH 101: Basic Physical Chemistry

Chemical reactions, stoichiometry, equilibria and kinetics; physical changes: solids, liquids, gasses and solutions; gas laws: real gases and Van der Waal' s equations. Solutions of inorganic compounds and colligative properties, electrochemistry; redox reations, electrolysis, conductance, Electromotive force (E.M.F) of a cell and Nernst equation.

SCH 102: Basic Inorganic Chemistry

Periodic table, atomic structure and electronic configuration, spectra of hydrogen and hydrogen-like atoms; bonding: shapes and molecular structure of simple inorganic compounds, models to illustrate three dimensions; inorganic reactions; acid-base, reduction and oxidation.

FIRST YEAR, SECOND SEMESTER

SCH 103: Basic Organic Chemistry

Carbon atom and its position in the periodic table; bond formation, orbital hybridization; nomenclature, structure and stereochemistry; alkanes, alkenes, cycloalkanes, alkynes; organic reactions and functional groups; alkanones, alkanols, alkanals, alkanolic acids and their derivations, alkenes, alkynes, halides, sulphur and nitrogen compounds, as well as benzene and its derivatives.

SCH 104: Basic Analytical Chemistry

Qualitative and quantitative data; metric system of units; precision and significant figures; dimensional analysis; chemical calculations; the mole concept, the simplest and molecular formulas; determination of atomic mass; coefficients in chemical equations; stoichiometry; limiting reagent, percent yield; reactions in solution: precipitation reactions, solubility rules, titrations; acid - base, oxidation reduction. Solubility product constant, common - ion effect complexation reactions, acidity and salt solubility, Q_{sp}/K_{sp} Criterion, selective precipitation, sulphide separations, hydroxide separations, amphoteric hydroxides. Qualitative analysis.

SECOND YEAR, FIRST SEMESTER

SCH 202: Inorganic Chemistry I

Atomic structure; atomic spectra, Bohr's model of hydrogen atom systems containing more than one electron; the Schrodinger equation, the hydrogen atom and other one-electron species, bonding, valence bond theory and molecular orbital theory, bond energy and bond-lengths, ionic solids and ionic structures; tetrahedral and octahedral.

SCH 203 : Organic Chemistry I

Three-dimensional concept in organic compounds as illustrated by molecular models; Lewis structure of organic compounds; orbital hybridisation; bond length, polarization angles in carbon-carbon single, double and triple bonds; simple orbital models of bonds in cyclopropane, benzene and C-N compounds. Basic concepts of configuration and stereoisomerism at carbon atoms; optical isomerism; definition, measurement and application; formation, stability, structure and activity of reactive intermediates; carbonions, carbocations, free radicals, carbenes and nitrenes; concepts of organic reaction mechanisms; classification of organic compounds according to functional groups containing oxygen, sulphur, halogen, nitrogen, silicon, phosphorous, and metallic elements, and carbon-carbon bonds.

SECOND YEAR, SECOND SEMESTER

SCH 205: Inorganic Chemistry II

General structure of s and p block elements; ionization energies, electronic affinities and electronegativity, compound formation and properties of inorganic and organo-metallic compounds; sources and extraction of the elements; soda ash, bauxite, flouspar, nitrogen and carbon dioxide; group properties and inorganic reactions.

SCH 206: Organic Chemistry II

Bond energies and methods of estimation; heat of combustion of alkanes and halogenation of alkanes; mechanism and stereochemistry; nucleophilic displacement and elimination reaction involving alkyl, cycloalkyl, alkenyl, and alkynyl halides and alcohols, addition reaction to carbon-carbon and carbon-oxygen multiple bonds, tautomerism, ionization and transition states; benzene addition and displacement reactions; nitration halogenation, alkylation, acylation and sulphonation; directive effects of the functional groups on these reactions; nucleophilic reactions on benzene ring.

THIRD YEAR, FIRST SEMESTER

SCH 301: Chemical Thermodynamics and Equilibrium

Second law of thermodynamics, definitions and property of entropy, thermal and mechanical stability of a system. Third law of thermodynamics, equilibrium conditions and spontaneity, driving forces for natural changes; chemical equilibrium and chemical potential in the ideal solution and a mixture, equilibrium constants, partial and molar quantities and additivity rules; phase equilibria in simple system; the phase rule, the Clapeyron equation, phase diagrams for carbon dioxide and water; solutions; the ideal solution and colligative properties, Application of Gibbs-Duhem equation, temperature-composition and U diagrams, ideal dilute solution, the lever rule; fractional distillation and azeotropes; Henry's law and the solubility of gases.

SCH 310: Analytical Chemistry I

General methods in elemental analysis; systematic qualitative analysis; applications of the following techniques analysis in food and drug industries and in environmental surveillance and risk assessment; gravimetric and volumetric analysis; electropotentiometry, calorimetry, potentiometry, conductometric titration, polarimetry, flame photometry and chromatography (TLC, paper, column, GC, GLC & HPLC).

THIRD YEAR, SECOND SEMESTER

SCH 303: Natural Products Chemistry

Classes of secondary and primary metabolites; structure, functions nomenclature and biosynthesis of waxes, hydrocarbons, flavonoids, quinones, terpenoids, carotenoids, steroids,

alkaloids, carbohydrates, saccharides, lipids, proteins, amino acids and nucleic acids; methods of isolation and structural studies of the secondary and primary metabolites, synthetic studies of some important examples.

SCH 304: Group Theory

Symmetry elements and operations, general rules of multiplication of symmetry operations, Mathematical and symmetry (point) groups; character tables, non-degenerate representation, matrices and degenerate representations; applications in chemical bonding; molecular dissymmetry and optical activity.

FOURTH YEAR, FIRST SEMESTER

SCH 403: Lanthanides and Actinides

Lanthanides and actinides; occurrence, isolation, electronic structure and stereochemistry of rare-earth complexes; synthesis and applications of compound rare-earth and elements.

SCH 404: Quantum Chemistry I

The quantum theory, the Schrodinger wave equation, operators; principles, methods and theorems of quantum mechanics, application to chemical systems; one electron atom molecules and chemical bonds; structure of di- and poly-atomic molecules; interpretation of molecular spectra.

FOURTH YEAR, SECOND SEMESTER

SCH 410: Techniques in Organic Chemistry Laboratory

Modern techniques in organic synthetic and analytical chemistry; micro-preparative scale of single and multistep synthesis of known organic molecules; methods of monitoring course of reactions; TLC, GLC, MS and NMR, UV and IR.

SCH 411: Organic Stereochemistry

Molecular geometry and chemical bonding involving organic compounds; molecular models and planer depictions of compounds; conformational analysis and steioisomerism in unsaturated and cyclic compounds; concepts and applications of chirality and molecular symmetry in physiological processes and synthetic organic chemistry.

ZOOLOGY

FIRST YEAR, FIRST SEMESTER

SZL 101: Invertebrate Zoology

Introduction to the invertebrates: their classifications, external structure, locomotion, nutrition, excretion, nervous system, reproduction and embryology; Kingdom protozoa: Phylum sarcoma stigophora; Kingdom metazoa: Phyla porifera, cnidaria, ctenophora, platihelminthes, nematoda, sipunculida, mollusca, enchiura, annelida, arthropoda, chaetognatha and echinodermata; Field experience.

SZL 102: Vertebrate Zoology

General physiological and anatomical characteristics of the lower vertebrates (acraniata), hermichordates, urochordates, cephalochordates; characteristics of higher vertebrates (craniata): heterostraci, osteotraci; petromizontia, myximoidea, placodermi and elasmobranchii; the evolutionary trends, general biology and classification of the osteichthyees, amphibia, reptilia, ayes, mammalia; Field experience.

FIRST YEAR, SECOND SEMESTER

SZL 103: Introductory Genetics & Evolution

Origin of evolutionary thought. Neo - Darwinism and Darwinism today. Evolution facts and theory. Heredity, fidelity and mutability. Genotype and phenotype. Mendelian and molecular genetics. Population genetics. Mutation. Isolating mechanism and speciation. Adaptation and adaptive radiation, altruism, natural selections hybridization. Genetic recombination. Populations and demes. Sources of genetic variation. The Hardy — Weinberg theory. Fossil record and dating the past. Human evolution. Social issues. Hominid fossil record. Evolution of human

behaviour, cultural evolution. The future of evolution. Current topics in Genetics and Evolution. Tools in Genetics and Evolution.

SZL 104: Higher Invertebrates

Introduction to the higher invertebrates. Origin of metazoans. Classification, general body structure, locomotion, nutrition, excretion and osmoregulation, reproduction of the following phyla: Nematoda, Annelida, Mollusca, Arthropoda and Echnoderm. Important parasites and vectors. Evolutionary relationship.

SECOND YEAR, FIRST SEMESTER

SZL 201: Cell Biology

History, philosophy and concepts: The cell theory, the generalized cell, structural and functional levels of organization in cellular systems; the cell as a unit of structure and function of an organism; simple “living” units: the viroid, the viruses and the mycoplasma; general characteristics of the bacteria; prokaryotic eukaryotic cells; cell organelles and membranes: Molecular models and functions of cell membranes; the nucleus and the cell secretion; the golgi complex and glycosidation; the endomembrane systems and molecular targeting; the mitochondria and oxidatyive phosphorilation; the cell surface and the cell recognition; plant chloroplasts and cell wall; the cytosol and the cytoskeleton and cell motility:microtubules and microfilaments; molecular organelles; Molecular aspects of protein synthesis: molecular components of the polysome; transcription, chain initiation, elongation and termination.

SZL 202: Basic Ecology

Definition of ecology; interactions between biotic and abiotic factors; nutrient cycles; energy and energy flow; productivity and the concept of food chain, webs and trophic levels; ecosystems: Competitions, ecological niches, niche breadth and niche overlap; population dynamics: attributes, growth estimation, interaction distribution, fluctuation, regulation, and structure; communities: their classification, and interactions; a survey of terrestrial and aquatic ecosystems with special reference to the faunal and floral adaptations and biodiversity; man’s activities on the environment; Biological conservation and management; a field trip to a lake or a national park.

SECOND YEAR, SECOND SEMESTER

SZL 205: Arthropod Biology

An introduction to the phylum Arthropoda; diversity of the arthropod group; general classification and taxonomy of the arthropods; origin, evolution and phylogeny of the arthropods; life history of the arthropods of the agricultural, medical and veterinary importance (ticks, mosquitoes, tsetseflies, simulium, butterflies and moths): case study of the physiology and behavior of ticks, mosquitoes, tsetseflies, social arthropods (termites, bees, ants) principles of control of arthropod pests and diseases vectors: biological control, the use pesticides and their effects.

SZL 206: General Parasitology

Introduction to parasitism and other related phenomena; economic importance of parasites; life cycles and effects of helminthes, protozoan and arthropod parasites in domestic animals and humans; methods of transmission and control measures, including pest management.

THIRD YEAR, FIRST SEMESTER

SZL 301: Developmental Biology

History, philosophy and concepts; Gametogenesis and Vitellogenesis; fertilization and egg activation; nuclear and cytoplasmic changes following egg activation; cleavage; nucleocytoplasmic interactions during early development; Gastrulation, neurulation, embryonic induction and morphogenesis; extra embryonic membranes; implantation, placentation, organogenesis; some aspects of teratogenesis.

SZL 302: Biostatistics

Introduction to statistics: presentation of data, bar charts, pie charts, histograms, frequency distribution, curves and averages, means and weighted means, median, dispersion and standard deviation, measures of central tendency and standard deviation, measures of central tendency and dispersion, analysis of variance and covariance and probability of testing; Bayes theorem, quantitative treatment of biological data; testing of significance, confidence intervals, difference between means, univariate and multivariate analysis, parametric and non — parametric tests, T-

test; statistical relationship, application of statistical techniques to specific biological data; design and analysis of biological experiments.

THIRD YEAR, SECOND SEMESTER

SZL 303: General Genetics

Autosomal linkage and chromosomal mapping: the linear order of genes, interference; chromosomal variation; deletions; inversions, duplications translocations, aneuploidy and polyploidy; gene interactions; chemical bases of heredity; mutations, gene regulation; the Operon concept, Extra-chromosomal inheritance; multiple alleles; kinds of genetic variation in natural populations; gene frequencies in populations; quantitative genetics; fundamentals of evolution.

SZL 304: Comparative Animal Physiology

A comparative study of the major physiological processes of vertebrate: Organs and processes of digestion, reproduction, respiration, circulation, osmoregulation, thermoregulation; neurophysiology; sensory physiology; metabolism; hormonal integration.

FOURTH YEAR, FIRST SEMESTER

SZL 401: History and Philosophy of Biology I

Reasons for the study of History and philosophy of science; methods and aims of the history of science; the early philosophy of the African people of Kamete and Nubia; the concept of Nun (Nun = matter); the fundamental elements: earth, fire and air; science in the Nubo-Kametean Medical Science and its contribution to the development of biology; Amhotep; Awiti, Anatomy and Philosophy among non- African peoples: Babylonians; Chinese; Indians; Israelites; Ionians; Greeks; Aristotle; Arabs and Iranians in the development of biology.

SZL 402: History and Philosophy of Biology II 3

Biology during the European renaissance; biology during the seventeenth and eighteenth centuries (Christian Era); microscopy and micro technology; chemistry and development of biology: Kant and Goethe; the Northwestern European (German, Scandinavians, English and French) natural philosophical biology.

FOURTH YEAR, SECOND SEMESTER

SZL 407: Phycology

Distribution of the different algae groups in the marine environment; the botany of green, brown, red and blue-green algae; growth and reproduction and adaptation and chemistry of phycocolids; culturing of algae; Economic importance of algae: the natural products, their extraction and commercial value.

SZL 408: Medical Entomology

Introduction to insects of medical importance; biology and ecology of major insects of medical importance with special emphasis on mosquitoes, flies (housefly, Tsetseflies, simulium, sandflies) and mites; principles of vector control and management; insecticides- classification, chemistry, mode of action, safety and ecological effects; biological control agents, genetic techniques in the laboratory; field experience.