

ISC 111 MATHEMATICS FOR SCIENCE 11 (ARITHMETIC) 1 CREDIT COMPULSORY

- Calculate basic arithmetic functions.
- Simple algebraic equations
- Evaluations of numerical expressions.
- Positive and negative indices and square roots.

ISC 112 SCIENCE EDUCATION 1 CREDIT COMPULSORY

- History and philosophy of Integrated Science.
- Traditional african ideas about learning
- Behaviourism.
- Constructivism.
- Skinner's behavioral ideas.
- The Bloom taxonomy of educational objectives
- Gagne's ideas
- Piagetian Stage theory
- Brunner's ideas.
- Ausubel and the alternative conception movement
- Application of education theories to science teaching
- Stages of cognitive development and the cognitive demands of science curricula
- Children's alternative conceptions
- Science concepts
- Science Education research from Nigeria
- Finding out what children already think and know
- Presenting counter demonstrations and arguments, generating cognitive conflict
- Drawing arguments and evidence together
- Maximizing children's involvement in their own learning
- Using context to explain concepts
- Use of analogies (similes and metaphors)

ISC 113 INTRODUCTIONS TO SCIENTIFIC METHODS 1 CREDIT COMPULSORY

- Senses and related organs
- Observations
- Microscope, hand lens, Telescope, Glasses, hearing aids
- Measurement of length , area, volume, mass , temperature , and time
- Classification of objects (colour, shape , behaviour and other observed criteria)
- Classification of living things (plants , and animals, vertebrates and invertebrates groups of vertebrates, flowering and non- flowering p[lants)
- Ethics of science and developing scientific attitudes
- Products of scientific investigations/implication
- Science process skills

ISC 114

COMPONENTS OF THE ENVIRONMENT 1

1 CREDIT

COMPUSORY

- Air pollution , sources and consequences of air pollution
- One method for determining the proportion of oxygen in the atmosphere
- Qualitative and quantitative composition of air
- Physical properties and uses of oxygen and carbon dioxide and their importance to living things
- Sources of water and contaminating agents
- Importance of oxygen dissolved in water
- Compare rural and urban water supplies
- Methods of water purification
- Water cycle
- Elements of weather
- Simple weather recording instruments
- Organisms that live in soils in our environment
- Mineral component of the soil
- Soil formation
- Types of soil
- Importance of soil
- Soil erosion and the relevant preventive measures
- Bush Burning
- Drainage patterns, causes, prevention and effect

ISC 115

NATURE OF MATTER 1

1 CREDIT COMPULSORY

- States of matter
- General physical properties of solids, liquids and gases
- Boyle's law, Charles' law. Ideal gas law
- Vapour pressure
- Macromolecular structure of NaCl as an ionic solid and carbon (diamond)
- Classification of matter
- Classification of common elements
- Elements compounds and mixture
- Structure of the atom
- Concepts of atomic number and mass number
- Isotopes
- Oxidation / Reduction (properties along period and group)
- Ionic and covalent compounds

ISC 121 MATHEMATICS FOR SCIENCE**1 CREDIT COMPULSORY**

- Graphs and forms
- Variables and scales for graph plotting
- Slope and intercept on a linear graph;
- Standard linear form $y=mx+c$
- Forms of common plots such as $\frac{1}{x}$, x^2 , $1/x^2$, $\sin x$, $\cos x$, e^{ax} , $\sin x$, $\cos x$
- Slope of a tangent to a curve as a means of obtaining gradient
- Geometry and Trigonometry
- d/dx for a rate of change with respect to variable x ,
- area below a curve and relate this to integration
- Histogram plots,
- Simple harmonic motion

ISC 122 PROCESSES OF LIFE 1 CREDIT COMPULSORY

- Photosynthesis
- Test leaves and storage organs for starch
- Combustion and respiration
- Oxidation and reduction
- Respiration
- Energy change during the burning of food
- Respiratory System and problems connected to breathing
- Nutrition (classes , sources and importance of nutrients)
- Interrelationship between population, personal health and nutrition
- Digestive system
- Absorption of food and simple food test.
- Food storage
- Circulatory system
- Excretory system
- Nervous system
- Skeletal system

ISC 123 MAN AND ENERGY 1**2 CREDITS COMPULSORY**

- Force ,
- Work done
- Energy (forms of energy)
- Transfer of energy
- Renewable and non-renewable energy
- Conservation of energy
- Temperature
- Celsius and Kelvin temperature scales- and the concept of absolute zero of temperature
- Heat
- Heat transfer by conduction , convection and radiation .
- Light (propagation, shadows and eclipse
- Laws of reflection
- Image formed by a plane mirror
- Uses of convex and concave mirror
- Sound waves longitudinal waves
- Velocity of sound in air
- Factors which cause changes in the frequency of sounds
- Pitch of a sound

ISC 211**COMPONENTS OF THE ENVIRONMENT II 1 CREDIT COMPULSORY**

- Characteristics and Classification of Living and Non-Living Things
- Classification of growth (temporary and permanent changes)
- Plant and animal Cell
- Chromosomes and Genes
- Bacteria and viruses
- Importance of bacteria
- Diseases caused by viruses and bacteria
- Fungi and state their characteristics
- Types of fungi
- Occurrence of fungi, their use as food

ISC 212**SCIENCE EDUCATION II****1 CREDIT COMPULSORY**

- Time
- Lesson Planning
- Resource
- Activities
- Grouping of pupils for activities
- Traditional role of the teacher
- Developing or changing subject content

- School as an encouraging or a restricting environment
- Finding out what children already think and know
- Presenting arguments and cognitive conflict
- Drawing arguments and evidence together
- Maximizing children's involvement in their own learning
- Using context to explain concepts
- Use of analogies (smiles and metaphors)

ISC 213

MAN AND THE ENVIRONMENT

1 CREDIT COMPULSORY

- Human Beings as Higher animals
- Characteristics of primates
- Application of basic intelligence skills
- Introduction ecology
- Ecosystem (food chains, food webs)
- Carbon and Nitrogen cycles.
- Importance of fertilizers in food production
- Traditional and modern methods of food preservation
- Associations (parasitism, symbiosis and commensalisms)
- The role of Man in resource development
- Resources exploitation by man (deforestation, desertification mining etc)
- Environmental pollution (causes, consequences and control)
- Ozone layer
- Conservation and recycling of natural resources
- Population and effects of urbanization on the environment
- Field trip

ISC 214

LABORATORY MANAGEMENT AND SAFETY

1 CREDIT COMPULSORY

- Laboratory Management
- Laboratory rule
- Laboratory equipment/apparatus
- Storage and management procedure
- Microscope
- Balances (parts , manipulation and types)
- Preparation of solution – Molar and percentage
- Indicators-pH ranges
- Uses of burners, and pipettes and their maintenance
- Bunsen burners, flame parts and adjustments
- Glassblowing
- Accumulator , circuit connection – series and parallel
- First aids for

ISC 215 WORKSHOP PRACTICES, SKILL ACQUISITION AND ICT 1 CREDIT COMPULSORY

- Improvisation (definition and advantages)
- Paperwork in modelling
- Glass work Glass – cutting , construction of aquarium
- Preparation of skeletons and herbariums
- Elements of painting
- Metal workshop (soldering , welding and engraving techniques)
- ICT (meaning component and importance)
- Instruments used in electrical workshop
- Simple circuit connection and types
- Fuses and uses
- Elementary electronics
- Mechanism of radio and tape recorder and T.V functions
- Wave lengths and channels
- Batteries – types, functions and maintenance
- Meaning and reasons for skill acquisition

ISC 221 NATURE OF MATTERII 1 CREDIT COMPULSORY

- Atomic structure
- Periodic table
- Physical and Chemical Change
- Separation Technique
- Transition Element and their Properties
- Reactions of some Ions
- Volumetric Analysis

ISC 222 SCIENCE EDUCATION II 2 CREDITS COMPULSORY

- Developing a course
- Developing a lesson
- Mixed ability groups
- Special educational needs (care)
- Board work
- Demonstration method
- Practical activities
- Discussions method
- Teaching / learning aids
- Purposes of assessment
- Different modes of writing questions
- Preparing marking schemes

- Preparing marking schemes
- Evaluation of classroom activities and end of course performance
- Micro- teaching

ISC 223 DYNAMICS 1 CREDIT COMPULSORY

- Speed
- Acceleration
- Speed/Time Graph for Linear Motion
- Newton's Law of motion
- Gravitational Force
- Concept and Purpose of space travels
- Satellite and Its uses in the society
- Momentum
- Conservation of linear momentum
- Motion in a Circle
- Simple Harmonic motion

ISC 224 RESEARCH METHOD 1 CREDIT COMPULSORY

- Research (Meaning , types and importance)
- Identifying the topics
- Topic selection
- Literature Review
- Construction of instruments
- Data analysis
- Project reports

ISC 225 CARBON COMPOUNDS 1 (1 CREDIT COMPULSORY)

- Introduction to Carbon chemistry
- Catenation of carbon
- Aliphatic hydrocarbons
- Crude Oil
- Refining crude oil, its uses and its economic importance
- Cracking
- Octane number of a fuel
- Coal
- Resource management and national wealth
- Mineral exploration
- Pollution management

ISC 321 MAN AND ENERGY II**2CREDIT COMPULSORY**

- Magnetism
- Law of magnetism
- Magnetic induction
- Electrostatics
- Static electricity and Magnetism
- Electrostatics
- Current Electricity
- Simple Circuit and their functions
- Conductor and electrical Insulator
- Series and Parallel Circuits,
- Transfer of Chemical energy to electrical Energy
- Electromagnetism
- Ohm's Law
- Direct and Alternating Currents
- Mains electrical Circuits
- Principle of A ring – Main Circuits
- Principle of Earthing Appliance and Other Safety Aspects of Electrical Circuits
- Radioactivity (Types, Properties, uses and danger)

ISC 322 REPRODUCTION AND GROWTH**1CREDIT COMPULSORY**

- Sexual reproduction
- Reproductive system
- Human development
- Monthly Cycle
- Pregnancy
- Contraception and family planning
- Growth and development
- Parturition and lactation
- Puberty
- Human potential for population growth
- Growth in plant
- Introductory embryology

ISC 323 CARBON COMPOUND II**1 CREDIT COMPULSORY**

- Haloalkanes (Reactions, Importance and Dangers)
- Alkanols (General formula, Preparation, Properties and uses)
- Alkanoic Acids (General Formula , Preparation, Properties and uses)
- Amines and Amino Acids (General Formula, Classes, Properties and uses)
- Synthetic Macro-Molecules
- Polymerization

ISC 324 EARTH AND THE MOON**1 CREDIT ELECTIVE**

- Natural Cycles (days, Lunar Months, And Year)
- Seasons (harmattan; Summer / Winter , Rainy / Dry)
- Structure of the Earth
- Geological Time scale
- Atmosphere
- Rocks (Types and Formation)
- The moon
- Relationship between Moon and the Earth
- Solar and Lunar eclipse

ISC 325 GLOBAL ECOLOGY 1 CREDIT ELECTIVE

- Science and Technological development on Population
- Gender roles in Society and Culture
- Diseases (Causes, Effects, Treatments)
- Drug abuse
- Methods of diseases Transmission
- Contacted Disease (Spread, Prevention and control)
- Blood Transfusion
- Preventive medicines
- Immunization