A COURSE OUTLINE FOR TECHNICAL INSTITUTES

DIPLOMA IN INFORMATION TECHNOLOGY

MINISTRY OF EDUCATION
DECEMBER 2003

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PROGRAMME DESCRIPTION

Introduction

Information Technology (IT) is the technology that supports activities involving the creation, storage, manipulation and communication of information. The principal equipment involved in IT are computing, telecommunications, and electronics devices. Computer Science may be defined as the study of the design and use of computers, with a primary focus on computer programming. This two-year full time course combines aspects of both Information Technology and Computer Science to prepare students for a future in the world of computers.

Objectives

The primary focus of this programme is to give students the theoretical and practical computer experience to prepare them for immediate entry into the job market. Graduates should be well equipped to take up any challenge in the information and communication technology industry. The Institutions are of a pre-university standard and also prepare students for further studies at the university level.

This programme is intend to train students to:

- Work in the IT industry
- Incorporate IT into existing businesses and companies
- Start a small business offering IT services
- Work as a Computer Technician
- Pursue further studies in Information Technology and Computer Science

The first year takes students through basic IT literacy and then focuses on: software applications, hardware repairs and maintenance, and networking. By the end of this first year students should be productive and proficient end users of the computer who are able to do most computerized office work, troubleshoot computer hardware problems, and understand the fundamentals of networking and data communications.

The second year will build on skills learned the first year and will include independent projects and research to help foster critical thinking and individual growth. Specifically the second year will focus on advanced computing skills and topics such as: troubleshooting windows, network and server administration, computer programming, web design, computerized accounting, Linux and open source software. The programme is streamline to prepare students to pass industry standard certifications such as A+, Network+, MOS, MCSE, and ICW.

Admission

Entry requirements are such that applicants should have a minimum of three (3) subjects CXC General Proficiency, G.C.E ‘O’ Level or its equivalent, or any technician/diploma level course at the GTEE level. After writing the entrance examination, applicants would be interview and subsequently notified of their acceptance into the programme.

Graduation

At the end of the two-year training period, students will write the Guyana Technical Education Examinations (GTEEs). Candidates who are successful in all seven-subject areas will receive a Diploma in Information Technology. The duration and requirements of examinable and non-examinable subjects are listed below.

Examinable Subjects

GTEE	Subject Name	Duration	Special Requirements
5300	English and Business Communication	180 hours	
5301	Management	180 hours	
5302	Mathematics	180 hours	
5303	Principles of Accounts	180 hours	30 hours in IT lab
5304	Software Applications	310 hours	270 hours in IT lab
5305	Hardware, Operating Systems, and Networking	300 hours	180 hours in IT lab and 60 hours in Electronics lab
5306	Programming and Web Design	250 hours	180 hours in IT lab

Non-Examinable Subjects

Subject Name	Duration
Statistics	90 hours
Electronics	60 hours
Entrepreneurial Studies	20 hours
Environmental Studies	20 hours
Social Studies	30 hours

Resources

In order to complete the practical aspect of the programme students must spend a minimum of nine (9) hours per week in the computer lab during the first year and twelve (12) hours per week during the second year. The computer to student ratio should be better than two computers for every three students.

Recommended Time Table

Subject	First Year Hours/Week	Second Year Hours/Week
English and Business Communication	3	3
Management	3	3
Mathematics	3	3
Principles of Accounts	3	3
Statistics	0	3
Electronics	2	0
Environmental Studies	1[1]	0
Social Studies	1	0
Entrepreneurial Studies	0	1[2]
Software Applications	10 (9 in IT lab)	1[2]
Hardware, Operating Systems, and Networking	4 (2 in EE lab)	6 (6 in IT lab)
Programming and Web Design	1[1]	8 (6 in IT lab)

[1] - This hour is for Environmental Studies in the first two terms and in the third term is for an introduction of Programming and Web Design.

[2] - This hour is for Entrepreneurial Studies in the first two terms and in the third term is for a review of Software Applications.

Testing Periods

This course outline is to be tested in June of 2005. Subsequent revisions should occur in August of 2005 for updates to be effected for the 2007 exam year.

GTEE 5300 – ENGLISH AND BUSINESS COMMUNICATION

Introduction
This course emphasizes grammar fundamentals and methods of communication, which are needed for functional operations within the world of work.

Objectives
On completion of this course students should be able to:
1. Create simple, compound and complex sentences using appropriate grammar and tense.
2. Write a composition of about 300 to 400 words on any topical issues.
3. Write various types of business documents such as: memorandums, reports, letters of complaints, etc.

Topics
- Functional Grammar: Vocabulary Development, Parts of Speech, Phrases, Sentence Types, Fragmentation
- Voice: Active and Passive
- Clause: Noun, Adverbial, Adjectival, Main
- Speech: Direct, Indirect
- Figures of Speech, Synonyms, Antonyms
- Comprehension and Interpretation
- Writing Skills: Paragraphing, Punctuation, Agreement and Tense, Synthesis and Sentence Construction, Composition
- Report Writing: Types of Reports, Short Communication, Letters, Memorandums, Job Applications

GTEE 5301 – MANAGEMENT

First Year:

The Nature of Management – Definition
The Development of Management Thought
Classical Approaches to the Study of Management:

- Behavioral, Management Science, Systems, Contingency

The Environment of Management:

- Internal and External, Social Economic, Legal Technological Policies

Planning as Function of Management:

- Types of Plans, Purposes of Planning, Steps in the Planning Process

Organising:

- Job Design, Line and Staff Relationships, Authority, Responsibility, and Accountability, Delegations and Control, Departmentalization

Staffing:

- Manpower Planning, Recruitment and Selection, Induction Organization, Separation

Influencing:

- Leadership and Motivation, Managerial Guide

Control:

- The nature of Control, Types of Control, Steps in the Control Process

Management of Change:

- The Nature of Change, Resistance to Change, How to Introduce Change

Communication:

- Forms, Barriers, Improving Communication Effectiveness

Decision Making:

- Types, Conditions, Group Decision, Steps in Rational Decision

Second Year:

The first year's work is to be done in detail. This programme is designed to allow students to apply concepts to real life situation, and build on the knowledge acquired in the first year. Opportunities will be taken to present case studies and use will be made of other experimental approaches to learning e.g. management games, simulation exercise, etc.

Emphasis is given to behavioral perspectives and quantitative of various systems of managerial thought and their effect on decision-making. The student is guided to integrate his/her knowledge of quantitative techniques and organizational behaviour so as to formulate complex management problems. The student is also expected to fuse scientific management techniques with quantitative tools and demonstrate how they are applied to managerial decision-making.

Short-term and long-term management decisions are analysed as a basis for rational decision-making. Team projects, which relate to the students' organizations and the business community, will be undertaken.

GTEE 5302 – MATHEMATICS

Number System:

- Approximation, Denary, Binary, Octal, Duodecimal, Hexadecimal, Change of Base

Arithmetic and Algebra:

- Identities, Functions, Partial Fractions, Transposition, Quadratic Equations, Factorization, Surds, Indices, Logarithms, Remainder Theorem, Pascal Triangle

Series:

- Finite and Infinite, Arithmetic, Geometric, Binomial, Convergent and Divergent, Exponential

Differentiation:

- Gradient of a Curve, Differentiation of Polynomials, Tangents and Normal, Stationary Values, Differentiation of Products and Quotients of Two Functions, Function of a Function: The Chain Rule

Integration:

- Integration as the reverse of Differentiation, Integration of Polynomial Functions, Integration as a Summation, Areas Under Curves, Integration by Partial Fractions

Trigonometry:

- Radians, Arc and Sector, Trigonometric Ratios, Inverse Trigonometric Functions, Trigonometric Equations

Complex Numbers:

- Imaginary Numbers, Complex Roots of Quadratic Equations, Cube roots of Unity, Argand Diagram, Exponential Form of a Complex Number, Graphical Form of a Complex Number

Vectors:

- Scalar and Vector Quantities, Base Vectors, Position Vectors, Cartesian Product, Components of a Vector

Hyperbolic Functions:

- Graphs of Hyperbolic Functions, Evaluation of Hyperbolic Functions, Inverse Hyperbolic Functions, Log Form of Inverse Hyperbolic Functions, Hyperbolic Identities, Relationship Between Trigonometric and Hyperbolic Functions

Matrices:

- Definition, Order, Types, Operations

Coordinate Geometry:

- Coordinate Geometry of the Circle and Parabola, Intersection of Lines and Curves, Cubic Curves, Parametric Coordinates, Loci

Curve Sketching:

- Even Functions, Odd Functions, Continuous and Periodic Functions

GTEE 5303 – PRINCIPLES OF ACCOUNTS

The aim of this course is to give the students a basic bookkeeping knowledge that will be required for their efficient execution of their duties. At the end of the course students should be able to:

1. Prepare bookkeeping records to the trial balance.
2. Prepare and understand the uses of documents used in preparation of accounts. (Examples: invoices and credit notes)
3. The account for various types of business organization, (sole traders, non-trading Organizations) including adjustments to final accounts.
4. The ability to prepare and interpret accounts for sole traders, partnerships as trading organizations.

CONTENTS:

Reasons for keeping records of business transactions. The theory of double entry bookkeeping. The recording of simple transactions concerning the purchase and sale of goods and the receipt and payment of cash. Books of original entry-cash books purchase daybooks, sales daybook, and return inwards book, return outwards book, petty cash book and imprest system. The journal proper, the ledger, including the three types of accounts: Personal, Real and Nominal; and rules for their construction. The objects and extraction of a trail balance. Trade and cash discounts-essential difference and how they are recorded. Types of errors and their effect upon the trail balance.

The bank in relation to the trader – chequebook, paying- in-book, bank passes book or statement. Bank reconciliation statement. Methods of payment currency, bank notes, postal orders, money orders, cheques-banker's order, credit transfer and trader's credit bills of exchange. Receipts and payments accounts, income and expenditure accounts, Elementary treatment of depreciation, goodwill, and provision for bad debts and doubtful debts.

Simple and partnership accounts and amalgamations of two sole traders to form a partnership. Simple adjustments at the end of the trading period. The preparation of a trading account, profit and loss account and a balance sheet from a given trail balance using vertical and horizontal formats. This would be in respect of a given trail balance using vertical and horizontal formats. This would be in respects of a sole trader or partnership and could include simple adjustments. Special areas, including control accounts, manufacturing accounts, incomplete records, suspense accounts, stock valuation.

During the second year students should spend an hour per week in the lab doing computerized accounting with DAC Easy or a comparable program.

GTEE 5304 – SOFTWARE APPLICATIONS

The examination schedule is as follows: One three hour exam weighted 100% practical based on the following software applications: MS Word, Open Office Writer, MS Excel, Open Office Calc, MS PowerPoint, Open Office Impress, MS Outlook Express, Eudora, MS Access, MS Publisher, Adobe Photoshop, and GIMP.

1. MS Word and Open Office Writer – Core Topics
   - Inserting and Modifying Text
     - Insert, modify, and move text and symbols
     - Apply and modify text formats
     - Correct spelling
     - Grammar usage (MS Word only)
     - Apply font and text effects
     - Enter and format Date and Time
     - Apply character styles
   - Creating and Modifying Paragraphs
     - Modify paragraph formats
     - Set and modify tabs
     - Apply bullet, outline, and numbering format to paragraphs
     - Apply paragraph styles
   - Formatting Documents
     - Create and modify a header and footer
     - Apply and modify column settings
     - Modify document layout and Page setup options
     - Create and modify tables
     - Preview and Print documents, envelopes, and labels
   - Managing Documents
     - Manage files and folders for documents
     - Create documents using templates
     - Save documents using different names and file formats
   - Working with Graphics
     - Insert images, graphics, diagrams and charts

2. MS Word and Open Office Writer – Expert Topics
   - Working with Paragraphs
     - Apply paragraph and section shading
     - Use text flow options (keeping lines together)
     - Sort lists, paragraphs, and tables
   - Working with Documents
     - Create and modify page borders
     - Format first page differently than subsequent pages
     - Use bookmarks
     - Create and edit styles

    - Create watermarks
    - Use Find and Replace with formats, special characters, and nonprinting elements
    - Balance column length (using column breaks appropriately)
    - Create or revise footnotes and endnotes
    - Create and modify a table of contents
    - Create cross reference
    - Create and modify an index
- Using Tables
    - Embed worksheets in a table
    - Perform calculations in a table
    - Link Microsoft Excel data as a table
    - Modify worksheets in a table
- Working with Pictures and Charts
    - Add bitmap graphics
    - Delete and position graphics
    - Create and modify charts
    - Import data into charts
- Using Mail Merge
    - Create main document
    - Create data source
    - Sort records to be merged
    - Merge main document and data source
    - Generate labels
    - Merge a document using alternate data sources
- Using Advanced Features
    - Insert a field
    - Create, apply, and edit macros
    - Copy, rename, and delete macros
    - Create and modify form
    - Create and modify a form control (for example, add an item to a drop-down list)
    - Use advanced text alignment features with graphics
    - Customize toolbars
- Workgroup Collaboration
    - Compare and Merge documents
    - Insert, view and edit comments
    - Convert documents into web pages

3. MS Excel and Open Office Calc – Core Topics
    - Working with Cells and Cell Data
        - Insert, delete, and move cells
        - Enter and edit cell data including text, numbers, and formulas
        - Check Spelling
        - Find and replace cell data and formats
        - Work with a subset of data by filtering lists

- Managing and Modifying Workbooks
    - Manage workbook files and folders
    - Create workbooks using templates
    - Save workbooks using different names and file formats
    - Insert and delete worksheets
    - Modify worksheet names and positions
    - Use 3-D references
- Formatting and Printing Worksheets
    - Apply and modify cell formats
    - Modify row and column settings
    - Modify row and column formats
    - Apply styles
    - Use automated tools to format worksheets
    - Modify Page Setup options for worksheets
    - Preview and print worksheets and workbooks
- Creating and Revising Formulas
    - Create and revise formulas
    - Use statistical, date and time, financial, and logical functions in formulas
- Creating and Modifying Graphics
    - Create, modify, position, and print charts
    - Create, modify, and position graphics

4. MS Excel and Open Office Calc – Expert Topics
    - Importing and Exporting Data
        - Import data from text files (insert, drag and drop) operations
        - Import from other applications
        - Import a table from an HTML file
        - Export to other applications
    - Using Templates
        - Apply templates
        - Edit templates
        - Create templates
    - Using Multiple Workbooks
        - Link workbooks
    - Formatting Numbers
        - Apply number formats (accounting, currency, and number)
        - Create custom number formats
        - Use conditional formatting
    - Printing Workbooks
        - Print and preview multiple worksheets
        - Use the report manager
    - Working with Named Ranges
        - Add and delete a named range
        - Use a named range in a formula

    - Use Lookup Functions (Hlookup or Vlookup)
- Working with Toolbars
    - Hide and display toolbars
    - Customize a toolbar
    - Assign a macro to a command button
- Using Macros
    - Record macros
    - Run macros
    - Edit macros
- Auditing a Worksheet
    - Trace errors (find and fix errors)
    - Trace precedents (find cells referred to in a specific formula)
    - Trace dependents (find formulas that refer to a specific cell)
- Workgroup Collaboration
    - Convert worksheets into Web pages
    - Create hyperlinks
    - View and edit comments

5. MS PowerPoint and Open Office Impress
    - Creating a Presentation
        - Create presentations (manually and using automated tools)
        - Add slides to and delete slides from presentations
        - Modify headers and footers in the Slide Master
    - Inserting and Modifying Text
        - Import text from Word
        - Insert, format, and modify text
    - Inserting and Modifying Visual Elements
        - Add tables, charts, clip art, and bitmap images to slides
        - Customize slide backgrounds
        - Add clipart elements to slides
        - Apply custom formats to tables
    - Modifying Presentation Formats
        - Apply formats to presentations
        - Apply animation schemes
        - Apply slide transitions
        - Customize slide formats and templates
        - Manage a Slide Master
        - Rehearse timing
        - Rearrange slides
        - Modify slide layout
        - Add links to a presentation
    - Printing Presentations
        - Preview and print slides, outlines, handouts, and speaker notes
    - Working with Data from Other Sources

    - Import Excel charts into slides
    - Add sound and video to slides
    - Insert Word tables on slides
    - Export a presentation as an outline
- Managing and Delivering Presentations
    - Set up slide shows
    - Deliver presentations
    - Manage files and folders for presentations
    - Publish presentations to the Web
    - Use Pack and Go (MS PowerPoint only)

6. MS Outlook Express and Eudora
    - Configure to Send and Receive Email form POP3 mail server

7. MS Access and Database Concepts
    - Creating and using Databases
        - Create Access databases
        - Open database objects in multiple views
        - Move among records
        - Format Datasheets
    - Creating and Modifying Tables
        - Create and modify tables
        - Add a predefined input mask to a field
        - Create Lookup fields
        - Modify field properties
    - Creating and Modifying Queries
        - Create and modify Select queries
        - Add calculated fields to Select queries
    - Creating and Modifying Forms
        - Create and display forms
        - Modify form properties
    - Viewing and Organizing Information
        - Enter, edit, and delete records
        - Create queries
        - Sort records
        - Filter records
    - Defining Relationships
        - Create one-to-many relationships
        - Enforce referential integrity
    - Producing Reports
        - Create and format reports
        - Add calculated controls to reports
        - Preview and print reports
    - Integrating with Other Applications

- Import data to Access
- Export data from Access
- Create a simple data access page

8. MS Publisher
   - Create a Publication
   - Working with Text
   - Working with Pages
   - Using the Design Gallery
   - Create an effective Brochure
     - Color and fill effects
     - Insert and manipulate pictures
     - Control Layers, grouping, and alignment

9. Adobe Photoshop and GIMP
   - Load, Align, and Save Images
     - Get pictures onto your computer
     - Find and open files
     - Magnify a picture
     - Fix Crooked Images
     - Save a picture
   - Quick Fixes for Improving a Picture
     - Correct Color
     - Adjust Brightness
     - Change the focus
     - Rotate an Image
   - Selecting Parts of a Picture
     - Select by Shape
     - Select by Boundaries
     - Select by color
   - Copy and Paste
   - Using Layers
   - Cropping and Resizing
   - Painting and Drawing
   - Rearranging Parts of a Picture (faces and body parts)
   - Adding Text to a Picture
   - Publishing your Pictures

Students should also be exposed to the following

- Drawing Tools – AutoCAD, Visio, Paint Shop Pro, Adobe Illustrator
- Multimedia programs for editing and converting digital audio, pictures and videos
- Compression Programs
- Use of Peripheral Devices and Lab Equipment: Printers, Web Camera, Digital Camera, Scanner, CD-RW, DVD-RW Drives, LCD Projectors

GTEE 5305 – HARDWARE, OPERATING SYSTEMS, AND NETWORKING

The examination schedule is as follows: one three-hour exam weighted 100% theory. It is recommended that the course be divided such that sections 1 and 2 are presented in the first year and sections 3, 4, and 5 are presented in the second year.

1. Computer Hardware Repairs and Maintenance
   - Components and Subassemblies of a Contemporary PC

Batteries, BIOS, Busses, CD Drives and Media, Chipsets, CMOS, CPU, Drive Adapters and Raid, DVD Drives, Enclosures, Cooling Devices, Floppy Drives, Hard Drives, Joysticks and Game Ports, Keyboards, Memory, Mice and Trackballs, Modems and Fax Cards, Monitors, Motherboards, Parallel Ports, Power Supplies, Serial and Infrared Ports, Sound Boards, Video Adapters, Removable Media Drives, SCSI Systems, USB

The Boot Process, Pre-service Checkout, Backup, Disassembly/Reassembly, Conflict Troubleshooting, Data Recovery Techniques, Enhancing System Performance, Error Codes, Plug and Play Configuration, Power Management, Setting up a Computer System, Portable PCs, Power Protections Devices, Printers

- Operating Systems
  - History and Concepts
  - Communication with Hardware
  - User Interfaces
  - Accessing and Supporting Programs
  - Organizing and Manipulating Programs and Data
  - Introduction to DOS
  - Hardware Requirements
  - Choosing the right O.S.

2. Networking

   Topologies, Network Operating Systems, Network Protocols, OSI Model, Networking Devices, Network Cabling, Network Terms, IEEE 802 Definitions, TCP/IP Suite, IP Routing, Name Resolution, WINS, DNS, DHCP, SNMP, IP Addressing, ISPs, Telecommunication Network, Dial up Internet Access, FTP, HTTP, History of the Internet

3. Windows Installation, Administration and Troubleshooting
   - Installation
     - Startup Disks and Bootable CDs
     - BIOS Settings
     - Installation versus Upgrade
     - Partitioning

    - Formatting File Systems: FAT32 and NTFS
    - Dual Booting
- Windows Start Up Options
- Service Packs, Patches, and Windows Updates
- System Properties: computer and domain name
- Add/Remove Hardware
    - Device Manager
    - Drivers
- Add/Remove Programs and Components
- Managing Users
    - User account types
    - Creating User Accounts
    - Use of Groups
    - Sharing resources
    - Securing files and folders
    - Encryption
    - Mapping network drives
- Disk Storage
    - Disk Manager
    - Disk Clean Up
    - Error Checking
    - Disk Defragmenter
    - Backup Tools and Strategies
- Commercial Utilities
    - Norton
- Firewalls and Virus Protection
- Local Area Connection Properties
- Dial-up Connection Properties
    - Internet Connection Sharing
- Internet Explorer Configuration
- Printers
    - Installing a local printer
    - Installing a network printer
    - Changing Printer Properties
    - Printer Queue
- Sending and receiving faxes
- Display Properties
- Multiple Monitors
- Setting Date and Time
- Folder Options
- File Types and File Associations
- Keyboard and Mouse Properties
- Power Options
- Regional Options

- Sounds and Multimedia
- Task Manager
- Computer Management Interface
- Event Viewer and Log Files
- The Registry
- Start Menu

4. Linux
   - Overview of Linux distributions and open source software
   - Preparation for Installation
   - Installation
   - Configuration of Users
   - Networking
     - Samba – File Sharing with Linux and Windows Machines
     - Printer Sharing
   - Simple Command Line Instructions

5. Windows Server Administration

   Students must be able to successfully install, configure and maintain a Windows domain and networking environment.

GTEE 5306 – PROGRAMMING AND WEB DESIGN

The examination schedule is as follows: one three-hour exam weighted 100% practical.

Introduction to C Programming

Introduction to Programming, Algorithms (sample), From Source Code to executable, Basic Variable Types, Constants - # define, Operators and Operands, Creating a simple program using an Integrated Development Environment, Casting, Formatting Data Display, Inputting and Outputting Data with Standard Files, Regular Expression, Conditional Expressions and Statement, Loops, Functions, Function arguments, return types and variables, Variable Scope, Mathematical Functions, Libraries, Program Design, Style, Importance of Commenting

Web Design

Develop and maintain Web Sites using authoring and scripting languages and create content and digital media.

- HTML in text editor
  - Tags
  - Images
  - Formatting
  - Hyperlinks
  - Tables
  - Cascading Style Sheets
  - Forms
  - Frames
- ASP
- JavaScript
  - Mouse Over
- Web Authoring Tools
- Cross Browser Considerations

STATISTICS

The overall objective of this course is to provide students with the opportunity to develop a sound background of the techniques of generating, collecting, presenting, analyzing and interpreting statistical data.

More specifically the course is designed to:

1. Provide students with the necessary skills to apply Statistical Techniques to business studies where necessary.
2. Prepare students to undertake studies at institutions of higher learning or advanced studies.
3. Equip students with the Statistical Tools necessary for scientific decision making generally and in the field of business specifically.
4. Gear students to conduct simple sample surveyed and to analyse the data collected.

The nature, sources, collection, tabulation and evaluation of business facts. Graphical methods of representation and the common types of charts used in industrial and commercial concerns. Frequency distribution. The practical use of averages, including arithmetic means, median and mode.

The meaning and use of dispersion, standard deviation and quartile deviation. The weighted average, calculation of index number as an example of weighted averages. The index numbers, which are calculated regularly, and uses in business requirements. The moving average trends, seasonal movements sources and kinds of the most important material published.

Description of Data:

- Measures of Control Tendency for Ungrouped and Grouped Data.
  - Introduction, Arithmetic Mean, Median, Mode
- Measures of Absolute and Relative Dispersion
  - Introduction, Range, Mean Deviation, Variance, Coefficient of Variation

Visual Presentation of Data:

- General Principles Concerning the Construction of Graphs and Tables

Regression

- Basic Ideas, Origin of the Term “Regression,” The Straight Line, The Linear Regression Equation, Predictions . . . Standard Error of Prediction and Confidence

Correlation

- The Size and Direction of the Linear Correlation Coefficient
- Types of Correlation

Probability

- Introduction, the Proportionate Law, The Law of Averages, The Addition law and the Multiplication Law of Probability, Permutations and Combinations

ELECTRONICS

List of Topics:

- Atomic Theory of Current Flow
  - Insulators, Conductors, Resistance
- Power Generation Transmission and Distribution
  - What is a transformer?
  - Types of Transformers
- Measuring Instruments – Digital Multimeter
- Resistors
  - What is a resistor?
  - Types of resistors
  - Application of resistor
  - Color code of resistor
  - Resistivity
- OHMS Law
  - Series Circuit
  - Parallel Circuit
  - Calculation of current, voltage, resistance
- Capacitors
  - Types of capacitors
  - Application of capacitors
  - Function of capacitors
  - Advantages and Disadvantages of Capacitors
- Semiconductors
  - Transistors
    - Types of Transistors
    - Uses of Transistors
  - Diodes
    - Forward Bias
    - Reversed Bias
    - Semi Conductors
  - Logic Gates
- Rectifier
  - What is rectification?
  - Types of Rectifier
    - Half Wave Rectifier
    - Full Wave Rectifier
- Amplifier
  - Amplifier with Feedback
- Modulation
  - AM (Amplitude Modulation)
  - FM (Frequency Modulation)
  - AM & FM Receiver & Transmitter

ENTREPRENEURIAL STUDIES

1. Entrepreneurship
   - Self-Employment vs. a Job
   - The Entrepreneurial Personality
   - Small Business Training
2. Defining the Business
   - Choosing a Product or Service
   - Identifying Potential Customers
   - Business Ownership, Partnerships, and Proprietorships
3. The Business Plan
   - Uses of the Business Plan
   - Sources of Help to Prepare a Plan
   - The Teacher as Consultant
4. Marketing Plans
   - Marketing Research
   - Knowing the Competition
   - Marketing Strategy
   - Setting Prices and Negotiations
   - Salesmanship and Promoting the Business
5. Financial Planning
   - Sources of Capital
   - Financial Statements
   - Cash-Flow Planning
6. Managing the Business
   - People Management
   - Protecting the Business
   - Reviewing the Business Plan
7. Business in Guyana
   - Trade and International Business
   - Business Regulations
   - Legal Issues

ENVIRONMENTAL STUDIES

1. Introduction to Environmental Studies
1.1 What are environmental studies?
1.2 Why are they important?
1.3 How can we best learn about the environment?
1.4 The role and purpose of environmental studies as it relates to Society.
1.5 The environment and the human factor-type of system and sub-system.
1.6 The three (3) "R's" of conservation (Reduce, Reuse and Recycle).
1.7 Reduce (Order what is required).
1.8 Reuse (Where containers are used for refilling e.g. empties).
1.9 Recycle (Use the same product to reproduce the same product or similar products e.g. when bottle and recycle old paper for others).
1.10 Minimize on cost, waste disposal and conserve on energy and time.

2. The Environment and its Role in the Development Process
2.1 The effect of the environment on economic and social development.
2.2 The mental and physical affects of the environment on individuals.
2.3 Transportation of goods and services (type of materials, packaging – separate chemicals form food and fuel).
2.4 The rural environment – Agriculture, forestry, wiring, filing, tourism.
2.5 The urban environment – industry, manufacturing, food processing, textiles, etc.
2.6 The Private Sector – Housing, School, Hospital, Sports, etc.

3. Legal and Regulatory Institutions to Monitor, Enforce, and Control the Environment
3.1 Environment Protection Agency Act (legal body)
3.2 Occupational Health and Safety Act (legal body)
3.3 Environmental Protection Agency (administrative) – Office of the President
3.4 Occupational Health Administrative – Ministry of Labour

4. Waste Management
4.1 Disposal of solid, liquid, and gaseous waste pollution
4.2 Safety measures and precautions
4.3 Use of chemicals and its protection to the Eco-system e.g. Fertilizer
4.4 Minimize the user of drugs and maximize the use of Biological control
4.5 Solid Waste Disposal – burn and bury precautions, portable water contamination
4.6 Safe means of transportation to site – danger sign
4.7 Protective clothing devices etc = location on sight
4.8 Liquid waste disposal – river, lakes, canal and oceans
4.9 Safety Precautions – dangerous toxic substances – especially as regards to animals and plants (waste from brewers, bauxite and manufacturing industries)
4.10 Gaseous waste disposal – carbon-monoxide, burning of fuels in combustion process, burning of bottles (plastic) containing chlorides.

Note: Solid liquid and gaseous waste have toxic and non-toxic results. Toxic is harmful while non-toxic is friendly.

5. Conservation and Protection of the Eco-System

5.1 Symbiosis system (living in harmony with the environment (plant and animal) etc. Use of resources or one depend on the other.

5.2 Agencies that affect conservation – animals (man), water (rainfall and natural), wind, natural disaster, plants

5.3 Conservation methods to minimize contamination of the environment

- Reforestation – size for cutting trees, avoid burning of trees and waste
- Marine and Aquatic Life – period of non-harvesting (mating season)
- Wild life – breeding season, non-trapping of wild life (e.g. birds and reptiles)

SOCIAL STUDIES

TOPICS

- The Individual
- The Environment & The Individual
- Earthquakes & Volcanoes
- Resources
- Problems in Society (drugs, peer pressure etc)
- Population
  Size, Growth, Improvement
- CARICOM
- The Family
- Groups
- Leaders
- Government
- Culture
- Socialization
- Communication
- People of Guyana
- Rural & urban Problems