1. INTRODUCTION

Technology is becoming an essential tool in education. Among many, Information Technology (IT) is playing a vital and significant role in education. As such educators’ literacy in IT is of paramount importance for introducing new teaching and learning paradigms.

The programme covers the essential area of IT useful for educators and focuses on training students in the core concepts of IT linked with education technology.

2. OBJECTIVES OF THE PROGRAMME

The objective of this programme is to provide thorough understanding of the information systems and technologies applicable to education and other areas. At the completion of this course, candidates will be able to effectively use IT in the process of education, software development, web design and applications and Graphic design.

3. PROGRAMME ELIGIBILITY

Applicants should possess a bachelor’s degree preferably in physical science or in a related area. Eligibility of candidates is determined according to the performance at an aptitude test and an interview.

4. PROGRAMME FEE

<table>
<thead>
<tr>
<th></th>
<th>Programme Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local candidates</td>
<td>Rs. 100,000/-</td>
</tr>
<tr>
<td>SAARC countries</td>
<td>US $ 3,300/-</td>
</tr>
<tr>
<td>Other countries</td>
<td>US $ 6,600/-</td>
</tr>
</tbody>
</table>

Programme fees shall be paid in two installments (50% at the registration and the balance 50% within six months from registration). Other payments including registration fee, medical fee, library subscription, examination fee and deposits (science and library) should be paid according to the procedure stipulated by the PGIS.
5. THE PROGRAMME STRUCTURE AND DURATION

The Postgraduate Diploma programme in Information Technology (PG. Dip. in IT) is a full-time programme consisting of coursework. Course work will be conducted over a period of two semesters of 15 - weeks each (during weekends and/or weekdays). Students who satisfactorily complete a minimum of 24 credit units of course work with a GPA of 2.75 or above are eligible for the award of Postgraduate Diploma in Information Technology.

The programme is structured into three stages as follows.

I. Beginners who commence with little or no programming experience must successfully complete the three **preliminary courses**.

II. All students must complete all the five **compulsory core courses**.

III. Students undertake five **elective courses** offered by the institute.

After being admitted to the programme, each student will be assigned to an academic advisor, whose advice should be sought when planning the Diploma Programme.

### Programme Summary

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lecture hrs.</th>
<th>Practical hrs.</th>
<th>No. of Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC 404</td>
<td>Introduction to Mathematics</td>
<td>15</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SC 405</td>
<td>Introduction to Computers</td>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>SC 406</td>
<td>Introduction to Programming</td>
<td>10</td>
<td>10</td>
<td>1</td>
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<tr>
<td>Semester I (Core Courses)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC 561</td>
<td>Computer Application Fundamentals</td>
<td>30</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>SC 562</td>
<td>Programming Principles</td>
<td>30</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>SC 563</td>
<td>System Analysis and Design</td>
<td>25</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>SC 564</td>
<td>Introduction to Database Systems</td>
<td>15</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>SC 565</td>
<td>Introduction to Computers and Computer Architecture</td>
<td>30</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Semester II (Elective Courses)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC 566</td>
<td>Communication Networks</td>
<td>30</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>SC 567</td>
<td>Educational Technologies</td>
<td>30</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>SC 568</td>
<td>Research Methodology</td>
<td>20</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>SC 569</td>
<td>Advanced Programming Techniques</td>
<td>30</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>SC 570</td>
<td>Implementation of Database Applications</td>
<td>60</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>SC 571</td>
<td>Document Markup Languages</td>
<td>30</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>SC 572</td>
<td>Web Page Construction</td>
<td>60</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>SC 573</td>
<td>Software Design and Development</td>
<td>30</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>SC 574</td>
<td>Mini Project in Computer Science</td>
<td>90</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>SC 575</td>
<td>Programming Web Applications</td>
<td>30</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>SC 576</td>
<td>Web Servers and Web Technologies</td>
<td>20</td>
<td>20</td>
<td>2</td>
</tr>
</tbody>
</table>
6. PROGRAMME CONTENT

SC404 - Introduction to Mathematics
Sets, Set operations, Relations and Functions, Graphs, Recurrence relation, Greatest common divisor, Fibonacci numbers, Counting rules, Pascal’s triangle, Binomial theorem, Probability, Boolean algebra.

SC405 - Introduction to Computers
Evolution of computers, Personal computers: basic components, their functionality and assembling a PC, Computer networks: introduction and advantages over PCs, Internet: email, MSM messenger and web browsing.

SC406 - Introduction to Programming
Basic component of a programming language, syntax and semantics, compilers and interpreters, basic data types, operators, identifiers, control structures: sequential, selective and repetitive structures, compiling and executing programs, introduction to object oriented programming.

SC 561 - Computer Application Fundamentals
Introduction to Computer Systems: Basic concepts of computer system, History of computer, Types of computer, Main parts of personal computer and their functions, Software
Word Processing: Overview, Facilities available in word processing software, add remove tool bars, Managing files, Create, open and rename files, Editing and formatting, Cut, copy and paste, font formatting, paragraph formatting and bullets and numbering, Tables, Adding and formatting tables, Page setup and printing, Paper size, orientation and margins, Page numbering and print setup, Tools, Spell checker and mail merge, Help.
Spread Sheet: Overview, Identifying cell, work sheet, name box, formula box and tool bars, Entering Data, Three kinds of data(Text, values and formulae and functions) Working with different formulae and functions, Custom lists, Formatting, Formatting cells, rows and columns, Custom formatting and conditional formatting, Protection, Protecting a work book, work sheet and a part of a work sheet, Charts, Adding and formatting charts, Macros, Creating and storing macros
Presentation: Views and design templates, Identifying various views (Normal, Slide sorter and slide show view). Using various design templates, Drawings and Diagrams, Inserting drawing objects (Auto shapes, curves and lines) and pictures, Charts, animations, slide transition and background formatting Formatting slides, Adding charts to the presentation, Setting animations and slide transition, Present Presenting the slide show, Publishing the show on the web.
Web Page Designing: Web Page Designing, Create a Web page for you. Creating a Web site with banner ads and counting number of hits to the page and periodicity.

Reference:
SC 562 - Fundamentals of Programming

Basic Concepts: The structure & definition of a HLL such as C, the concept of Data types and operation on data types. Structured Programme Development: Problem definition and specification, top-down design and development, Coding guidelines & standards in developing commercial application systems.

Writing a complete program: Sequential, alternation, and repetition control structure: formatted and unformatted basic input output, Modular structure programme modules in C, functions.

Pointers: Pointers concept, operations on pointers and usage of pointers. Array processing Character and string processing. Simple sorting and searching algorithms Bubble sort, sequential and binary search.

File processing: File Definition; processing logic for sequential and random files. Classification of Data types and Data Structure, scalar and structured data types, static and dynamic structures. Testing of programme via both black box and white box testing techniques and system integration via bottom-up or top-down approach.

References:
1. Programming With C- Byron Gottfried (Schaum’s Outline Series, 2nd Ed.)
2. How to Programme (2nd Ed.)- Deitel / Deitel, C (Prentice Hall, 1994)
3. Problem solving and Programing- Barclay, ANSI C (Prentice Hall, 1990)
5. Progamming in ANSI C- E Balagurusamy

SC 563 - Systems Analysis and Design


References:
1. System Analysis and Design – Elias M Awad

SC 564 - Introduction to Databases

Basic Database Concept; Communication with Database System; Introduction to Database Management System, Relational Database Model; Structured Query Language; Relational Database Design and Normalization; Transaction processing, Database Indexing and sorting.

References:

SC 565 – Introduction to Computers and Computer Architecture

Introduction to Computers and computer systems; Introduction to the Internet; Components of a computer and their functionalities; Introduction to operating systems; Computer arithmetic: binary numbers, octal numbers and hexadecimal numbers; Number conversions; Boolean Algebra, Logic gates and truth tables.
SC 566 - Communication Networks


References:
1. Computer Network- Andrew S. Tanenbaum
3. Local Area Network- S.K. Basandra
4. Computer Networks and Internet- Douglas E. Comer (3rd edition)
5. Mastering Internets – Coleman/Dyson

SC 567 - Educational Technologies

Educational technology in context, the big picture, planning and implementation for effective technology integration, learning theories and integration model, using instructional software in teaching and learning, using productivity software and other software tools in learning and teaching, using multimedia and hypermedia in teaching and learning, distance learning opportunities and options, integrating the Internet into education, a link to the future where is education is going with technology, technology in language arts and foreign language instruction, technology in science and mathematics instruction, technology in social study instructions, technology in art and music instruction, technology in physical education and health, technology in special education.

References:

SC 568 - Research Methodologies

Resource finding, Statistical/data analysis, Surveys, Semi-structured Interviews, Observations, Case Studies, Ethnographic studies, In-depth Interviews, Focus groups, Content Analysis, Action research, Personal reflections, Participant Observations, Technical writing, Conducting presentations, Interactive methods of teaching science using computer.

SC 569 - Advanced Programming Techniques

Java Basics, Constructor and Visibility, Extending Classes and Arrays, Exceptions and Nested Classes, Input and Output, JFC and Swing, JDBC, XML and Java, Servlets, JSP, and Beans, Web Service.
References:


SC 570 - Implementation of Database Application
RDBMS Programming with ACCESS and MySQL: Introduction to SQL, Benefit of SQL, Running SQL commands, Creating Database and Tables, Adding Data, Deleting Data, Updating Data, Altering Tables, Select Statements, Relational Operators and Constraint, Inner Joins and Outer Joins, Aliases and Synonyms, Built-in Functions, Creating Views, Database Sequences, Clauses, Index, Creating and Altering Table Space, Creating and Altering User, Granting and Revoking System Privileges and roles, Lock Table, Format Model.


References:

3. An Introduction to Database Systems - C. J. Dates
4. Database Management System – Bernard A. Banet
5. SQL, PL/SQL- The Programming Language of ORACLE -Ivan Bayross ( 2nd Revised Edition 2001)

SC 571 - Document Markup Languages

References:


SC 572 - Web Page Construction
Introduction to Internet Programming., Client/Server model, Browsers-Graphical and Hypertext Access to the Internet, HTTP – Hyper Text Transfer Protocol, Creating Internet World Wide Web pages, HTML

References:


SC 573 - Software Design and Development
Software life cycle, overview of software engineering, classic life cycle model, project planning, requirement analysis, software design fundamentals, design techniques, validation and verification, cost estimation and testing.

References

SC 574 - Mini Project in Computer Science
Development of an information system by applying software engineering techniques, database concepts and web programming.

SC 575 - Programming Web Applications
Explores the use of scripting languages, such as Java Script, PHP, and Java Applets in web site development. Examines the use of relational databases to create dynamic web sites. Extensive exposure in lecture and lab to web based application development tools. Students will develop a full-featured web based interactive educational application.

References:
2. Java 2 with Swing: Deitel and Deitel
SC 576 - Web Servers and Technologies

Introduction to Client Side Scripting, **JavaScript**: JavaScript syntax, JavaScript object model, JavaScript objects, Static objects, Forms objects, Event handling - Mouse related events, Keyboard events, Document events, Output in JavaScript, Introduction to VB Script. **ASP.net**: Implement ASP.net with VBScript, Use SQL & ADO to Interact with ASP.net Databases, Write Cookies on the Client Using ASP.net, **J2EE - Java Enterprise Edition**: JDBC, JSP, Servlets, **Hypertext Preprocessor**: Program structure, Use php to process html forms, Regular expressions for form validation and other applications, Read and write files, Database applications. **XML**: Understand the role of XML, Write XSL Documents to Describe how XML Documents are to HTML, Create Simple DTD & Schema Files to Describe the Grammar of XML, Differences between DTD’s & Schema, Differences between Cascading Style Sheets & XSL, **Other new trends in Web development**: Eg. SOAP, WSDL

**References:**
1. Java 2 with Swing: Deitel and Deitel
7. PROGRAMME EVALUATION

Programme evaluation will be as stipulated in the current PGIS Handbook.

8. TEACHING PANEL

Prof. S. R. Kodituwakku, Department of Statistics and Computer Science and Information Technology Center, University of Peradeniya  B.Sc. (Peradeniya), M.Sc. (AIT), Ph.D. (RMIT)

Prof. K. M. Liyanage, Department of Electrical and Electronic Engineering, University of Peradeniya  B.Sc. Eng. (Peradeniya), M.Eng. (Tokyo), D.Eng. (Tokyo)

Prof. A. A. I. Perera, Department of Mathematics, University of Peradeniya  B.Sc. (Peradeniya), M.Sc. (Oslo), Ph.D. (Melbourne)

Dr. J. Wijekulasooriya, Department of Electrical and Electronic Engineering, University of Peradeniya  B.Sc. (Peradeniya), Ph.D. (Northumbria, UK).

Dr. L. Samaranayake, Department of Electrical and Electronic Engineering, University of Peradeniya  B.Sc.Eng. (Peradeniya), Tech.Lit. (KTH-Sweden)

Dr. R. D. Yapa, Department of Statistics and Computer Science, University of Peradeniya  B.Sc. (Sri Jayawardhanapura), Ph.D. (Hiroshima)

Dr. U. A. J. Pinidiyaarachchci, Department of Statistics and Computer Science, University of Peradeniya  B.Sc. (Peradeniya), Ph.D. (Upsala)

Mr. L. S. K. Perera, Information Technology Center, University of Peradeniya  B.Sc. (Peradeniya), M.Sc. (Peradeniya)

9. PROGRAMME COORDINATOR

Dr. Amalka Pinidiyaarachchi  
Department of Statistics and Computer Science  
Faculty of Science  
University of Peradeniya  
Tel: 081 2394642