

# INTERNATIONAL PROFESSIONAL MANAGERS ASSOCIATION - UK



## INFORMATION COMMUNICATION TECHNOLOGY EXAMINATION SYLLABUS

### EXAMINATION SUBJECT AND SYLLABUS FOR INTERMEDIATE

This level is designed to provide:

- A deeper understanding of the key issues addressed for effective ICT operations and management; (building on the knowledge and skills gained from the foundation level programme)
- A study programme designed to enable participants to develop and apply analytical techniques for the solution of practical and ICT related management problems;
- Carefully supervised ICT related projects and assignments;

**Entry Qualifications** to this programme are completion of the International Professional Managers Association Foundation qualifying examination, or a recognized Higher National Diploma (HND) or equivalents.

#### EXAMINATION SUBJECTS

1. Advanced Spreadsheets
2. Advanced Database Management
3. Networking and the Internet
4. Systems Analysis and Design
5. Advanced Programming

## **COURSE CONTENTS**

### **ADVANCED SPREADSHEETS**

#### **Course Aims**

- To further develop the skills attained at the Diploma stage in the application of spreadsheets for management decision making (we recommend Microsoft Excel)
- To develop skills in using, summarizing and analyzing data for information purposes including pivot tables and statistical functions

#### **Learning Outcomes**

At the end of the course the student will have the ability to:

- Undertake more complex financial tasks using the spreadsheet
- Use the major function library within the Spreadsheet application
- Use pivot tables to present data
- Apply scenarios
- Use statistical functions on data to provide statistical analysis and reports

#### **Course Syllabus**

- Entering and summarizing data in lists and tables, placing subtotals in lists, creating pivot tables, learning and applying database functions
- Outlining worksheets, summarizing data, grouping and ungrouping rows and columns in outlines, consolidating data from multiple tables, using 3D references, altering data consolidation
- Using pivot tables, understanding parts of a pivot table, selecting data in a pivot table, creating and deleting pivot tables, selecting data source for pivot tables, creating pivot tables to consolidate multiple data ranges, changing layout of pivot tables, formatting pivot tables, sort data in pivot tables, using totals and subtotals in a pivot table, use summary functions for data analysis, creating

calculated fields in pivot table, changing formulas for calculated fields, creating pivot tables from external data source

- Understand the concept of what-if analysis, consider alternative methods to forecast values with what-if analysis, projecting linear and growth trends, creating one or two variable data table
- Understand the concept of scenarios, create scenarios, display scenarios, edit and merge scenarios, creating scenario summary reports
- Using spreadsheet for statistical analysis, using statistical functions to perform variance analysis correlation and covariance analysis, exponential smoothing, t-test analysis, histogram analysis, moving averages, ranking and percentile analysis, regression analysis, Fourier analysis, sampling analysis
- Using Macros, recording and running macros, editing and deleting macros

#### **Recommended Text**

**Book Title -:** Advanced Spreadsheets  
**Author -:** Sharon Murphy, Paul Holden ECDL  
**Publisher -:** Prentice Hall  
**ISBN No -:** 0130989835

#### ***Additional Reading***

**Book Title -:** Spreadsheet Projects in Excel for Advanced Level  
**Author -:** Julian Mott, Ian Rendell  
**Publisher -:** Hodder & Stoughton Educational  
**ISBN No -:** 0340800070

### **ADVANCED DATABASE MANAGEMENT**

#### **Course Aims**

- To develop further understanding of the design and implementation of a database system for an organisation's Management Information System.
- To consider data structures and their design for effective databases

- To develop understanding and design of databases for web applications.

### *Learning Outcomes*

At the end of the course the student will have the ability to:

- Design a Management Information System using database technology.
- Evaluate and Design appropriate data structures for the development of a database system
- Normalise data design for relational databases
- Design and implement database system on the web for e-commerce and information systems

### *Course Syllabus*

- Introduction to Information Systems
  - Database Systems concepts and their application.
  - The World Wide Web
  - Database systems in the World Wide Web
- Designing Management Information Systems
  - Data Models.
  - Specifying Information Requirements and Terminology.
  - Organising Information.
  - Relationships and Relationship Types.
- Designing Entity-Relationship Models.
  - Entity-Relationship Modeling.
  - Entity-Relationship Diagrams.
  - An E-R Model
  - Object-Oriented Data Models.
- Designing and Creating Relational Databases
  - Developing Relational Data Models.
  - Introduction to the Relational Model.
  - Relation Schemas and Keys.
  - Translating E-R Diagrams to Relation Schemas.
  - Representing Entity Classes as Relation Schemas.

- Representing composite, multi-valued, and derived attributes.
- Composite Attributes.
- Multi-valued Attributes.
- Derived Attributes.
- Representing Relationship Types as Attributes.
  - One-to-many Relationship types.
  - One-to-one Relationship types.
  - Representing One-to-One Relationships by Merging Entities.
  - Representing Many-to-Many Relationships as Tables.
  - Representing Weak Entity Classes.
  - Representing Inheritance as Tables.
- Relational Schemas and Normalisation.
  - Redundancy and Anomalies in Relation Schemas.
  - Functional Dependencies between Attributes.
  - Superkeys and Keys.
  - Normalization.
  - Third Normal Form (3NF).
- Manipulating Database Content with Relational Algebra.
  - Manipulating Information in Relational Databases.
  - Projection Queries.
  - Selection Queries.
  - Product Queries.
  - Queries with multiple join.
  - Combining Relational Operations.
  - Defining Complex Queries with Microsoft Access.
  - Applying Set Operators to Tables.
  - Creating User Interfaces in Access.
- Using SQL to Manipulate Database Content and Structure.
  - Using SQL Select Statements for Queries.
  - Modifying Database Content with SQL.
  - Creating and Manipulating Schemas with SQL.
- Developing Database Applications for the Web
  - Connecting to databases with ASP.
  - Executing select queries with ASP.
  - Creating objects from queries.
  - A general purpose query execution script.
  - Inserting new customer information.

### *Recommended Text*

**Book Title -:** Database Management: With Website Development Applications  
**Author -:** Greg Riccardi  
**Publisher -:** Addison Wesley  
**ISBN No -:** 0-201-74387-6

## **NETWORKING AND THE INTERNET**

### *Course Aims*

- To enable the student to understand the fundamentals of data networking and communications and its application in local area networks, wide area networks and the Internet.
- To relate networking principles and practice to the OSI Model
- To understand the importance of data security for networks.

### *Learning Outcomes*

At the end of the course the student will have the ability to:

- Fully understand the workings and the standards set for networking – the OSI Model.
- Design appropriate data networks for the organisation.
- Understand security issues in data networks
- Design appropriate security measures and practices to secure the network

### *Course Syllabus*

- Uses of Computer Networks.
  - Network Hardware
  - Network Software
  - OSI Model

- The Physical Layer
  - Theory of Data Communications
  - Transmission Media
  - Wireless Transmission
  - Communication Satellites
  - The Public Switched Telephone Network
  - The Mobile Telephone System
  - Cable Television
- The Data Link Layer.
  - Data Link Layer Design Issues
  - Error Detection and Correction
  - Data Link Protocols
  - Sliding Window Protocols
  - Protocol Verification
- The Medium Access Control Sub layer
  - The Channel Allocation Problem
  - Multiple Access Protocols
  - Ethernet
  - Wireless Lans
  - Broadband
  - Wireless
  - Bluetooth
  - Data Link Layer Switching
- The Network Layer
  - Network Layer Design Issues
  - Routing Algorithms
  - Congestion Control Algorithms
  - Quality of Service
  - Internetworking
  - The Network Layer in the Internet
- The Transport Layer
  - The Transport Service
  - Elements of Transport Protocols
  - The Internet Transport Protocols: UDP & TCP.
  - Performance Issues
- The Application Layer.
  - DNS—the Domain Name System.
  - Electronic Mail.
  - The World Wide Web.
  - Multimedia.

- Network Security
  - Cryptography.
  - Symmetric-Key Algorithms.
  - Public-Key Algorithms.
  - Digital Signatures.
  - Management of Public Keys.
  - Communication Security.
  - Authentication Protocols.
  - E-Mail Security.
  - Web Security.
  - Social Issues.

*Recommended Text*

**Book Title** -: Principles of Information Systems (8e)  
**Author** -: Stair & Reynolds  
**Publisher** -: Thomson Course Technology  
**ISBN No** -: 1-4239-0119-3

*Additional Reading*

**Book Title** -: E-Business and E-Commerce Management (3e)  
**Author** -: Dave Chaffey  
**Publisher** -: Prentice Hall  
**ISBN No** -: 13 978-0-273-70752-3

**SYSTEMS ANALYSIS AND DESIGN**

*Course Aims*

- To provide the student with the skills to undertake new systems development successfully.
- To provide the students with the requisite knowledge of techniques and methodologies for systems analysis

*Learning Outcomes*

At the end of the course the student will have the ability to:

- Define and isolate information and administrative problems which require IT solutions
- Plan and conduct systems analysis activities including data gathering and analysis
- Understand and apply different systems analysis techniques and methods
- Design new systems for prototyping, evaluation and implementation
- Design all supporting and maintenance activities for the new system

*Course Syllabus*

- The Context of Systems Analysis and Design
  - Information System Building Blocks
  - Information Systems Development
  - Project Management
- Systems Analysis Methods
  - Systems Analysis
  - Requirements Discovery
  - Data Modeling and Analysis
  - Process Modeling
  - Feasibility Analysis and the System Proposal
- Systems Design and Construction Methods
  - Systems Design
  - Application Architecture and Modeling
  - Database Design
  - Output Design and Prototyping
  - Input Design and Prototyping
  - User Interface Design
- Systems Implementation
  - Systems Implementation
  - Systems Operations and Support

*Recommended Text*

**Book Title** -: Systems Analysis And Design Methods With Projects And Cases Cd  
**Author** -: J. Whitten; L. Bentley

**Publisher -:** McGraw Hill  
**ISBN No -:** 0071204806

## **ADVANCED PROGRAMMING**

### *Course Aims*

- To provide the student with the basis for the development of a fully working Windows application of his/her choice.
- To develop the programme to designed and approved programme specifications.

*Students taking this course must have completed the Introduction to Programming at the Diploma level or an equivalent course.*

The Syllabus has been designed to enable the student to gain competency in using Microsoft Visual Basic as the programming development language. Students may also be allowed to select any programming development language of their choice.

**NOTE: This course does not require a formal examination. Students taking this course have to deliver, at an agreed date, a completed and documented working programme.**

Students taking this course must submit to the International Professional Managers Association Registrar a clearly written programme specification for approval. Changes or amendments to the proposal may be made by the examiners where deemed necessary.

Approval for the development of the programme will be conveyed to the student who will then commence his/her programming activities. An agreed timescale may be altered on written application.

### *Learning Outcomes*

At the end of the course the student will have the ability to:

- Produce a formal programme specification

- Develop the programme to the agreed specification
- Deliver the programme with appropriate supporting documentation.

### *Course Syllabus*

- Introduction to VB Programming
  - Memory Concepts Arithmetic
  - Decision Making Equality and Relational Operators
  - Using a Dialog to Display a Message
- Control Structures
  - Algorithms. Pseudo code
  - Control Structures. If/Then Selection Structure. If/Then/Else Selection Structures. While Repetition Structure. Do While/Loop Repetition Structure. Do/Loop Repetition Structure
  - Assignment Operators
  - Formulating Algorithms
  - Formulating Algorithms with Town-Down, Stepwise Refinement:
    - Essentials of Counter-Controlled Repetition
    - For/Next Repetition Structure
    - Selecting Case Multiple- Selection Structure
    - Do/Loop While Repetition Structure
    - Do/Loop Until Repetition Structure
    - Logical Operators
- Procedures
  - Modules, Classes and Procedures
  - Sub Procedures
  - Function Procedures
  - Methods
  - Strict and Data-Type Conversions
  - Value Types and Reference Types
  - Passing Arguments: Pass-by-Value vs. Pass-by-Reference
  - Duration of Identifiers
  - Scope Rules
  - Recursion
  - Recursion vs. Iteration
- Arrays
  - Arrays. Declaring and Allocating Arrays

- Passing Arrays to Procedures
- Passing Arrays: By Val vs. By Ref
- Sorting Arrays
- Searching Arrays:
  - Linear Search and Binary Search
  - Multidimensional Rectangular and Jagged Arrays
  - Variable-Length Parameter Lists
  - For Each/Next Repetition Structure
- Object-Based Programming
  - Implementing a Time Abstract Data Type with Class
  - Class Scope
  - Controlling Access to Members
  - Initializing Class Objects:
    - Constructors
    - Using Overloaded Constructors
    - Objects as Instance Variables of Other Classes
    - Using the Me Reference
    - Garbage Collection
    - Shared Class Members
    - Const and Read Only Members
    - Data Abstraction and Information Hiding
    - Software Reusability Namespaces and Assemblies
    - Class View and Object Browser
- Object-Oriented Programming: Inheritance
  - Base Classes and Derived Classes
  - Protected and Friend Members
  - Relationship between Base Classes and Derived Classes
  - Constructors and Finalizers in Derived Classes
  - Software Engineering with Inheritance
- Object-Oriented Programming: Polymorphism
  - Derived-Class-Object to Base-Class-Object Conversion
  - Type Fields and Select Case Statements
  - Abstract Classes and Methods
  - Non Inheritable Classes and Not Overridable Methods
- Exception Handling
  - Divide By Zero Exception
  - Net Exception Hierarchy
  - Final Block
  - Exception Properties
  - Programmer-Defined Exception Classes
- Handling Overflows
- Graphical User Interface Concepts:
  - Windows Forms
  - Event-Handling Model
  - Control Properties and Layout. Labels, Textboxes, and Buttons. Picture Boxes. Mouse-Event Handling. Keyboard-Event Handling. Menus
  - Link Labels
  - List Boxes, and Checked List Boxes
  - Combo Boxes. Tree Views. List Views. Tab Control
  - Multiple-Document-Interface (MDI)
  - Windows. Visual Inheritance
  - User-Defined Controls
- Graphics and Multimedia. Graphics Contexts and Graphics Objects.
  - Color Control. Front Control
  - Drawing Lines, Rectangles and Ovals
  - Drawing Arcs. Drawing Polygons and Polylines
  - Advanced Graphics Capabilities
  - Files and Streams
  - Data Hierarchy
- Files and Streams
  - Classes Files and Directory
  - Creating a Sequential-Access File
  - Reading Data from a Sequential-Access File
  - Random-Access File
  - Writing Data Randomly to a Random-Access File

*Recommended Text*

**Book Title** -: Visual Basic.NET: How to Program(2e)  
**Author** -: Harvey M. Deitel Paul J. Deitel, Tem R. Nieto.  
**Publisher** -: Prentice Hall  
**ISBN No** -: 0-13-029363-6