



ICCP's IS2010 ISA Model Curriculum Exam Outline

Information systems professionals work with information technology and must have sound technical knowledge of computers, communications, and software. Since they operate within organizations and with organizational systems, they must also understand organizations and the functions within organizations (administration, accounting, finance, marketing, operations, human resources, and so forth). They must understand concepts and processes for achieving organizational goals with information technology. In addition to sound technical knowledge and organizational understanding, they must possess systems thinking, the ability to analyze business problems, communication skills, and teamwork skills (Overby 2006) in face-to-face and virtual settings.

The high-level IS capabilities that this examination covers are as follows:

- Improving organizational processes
- Exploiting opportunities created by technology innovations
- Understanding and addressing information requirements
- Designing and managing enterprise architecture
- Identifying and evaluating solution and sourcing alternatives
- Securing data and infrastructure, and
- Understanding, managing and controlling IT risks.

1.0 Foundations of Information Systems (20%)

Information systems are an integral part of all business activities and careers. This section covers the key components of information systems - people, software, hardware, data, and communication technologies, and how these components can be integrated and managed to create competitive advantage.

1.1 Information Systems in Organizations

- Characteristics of IS professionals
- IS Career Paths
- Cost, Value and Quality of Information
- IS and Organizational Strategy
- Value Chains and Networks

1.2 Valuing Information Systems

- Making a Business Case for Information Systems
- Multi-Criteria Analysis
- Total Cost of Ownership and Return on Investment
- Purchasing Systems and IT Infrastructure
- Identifying and Implementing Innovations

1.3 Information Systems Components and Infrastructure

- Role of IT Infrastructure in a Modern Organization
- Hardware and Software
- User Interfaces
- Collaboration and Communication Technologies (social networking, virtual teams, viral marketing, crowd-sourcing)
- Data, Information and Knowledge

1.4 Facilities, Services and Organizational Models

- . Facilities
- . Help Desk and Customer Services
- . SOA
- . Organizational models

1.5 Systems Development and Acquisition

- . Systems Development Lifecycle
- . Alternative Development Approaches
- . External Acquisition
- . Outsourcing
- . End-User Development

1.6 The Internet and World Wide Web

- . Intranets, Internet, Extranets
- . E-business (B-to-C, B-to-B, E-Government)
- . HTML, Web 2.0 (wikis, tags, blogs, netcasts, self-publishing)
- . Content Management

1.7 Security of Information Systems

- . Threats to Information Systems
- . Information Systems Security Planning and Management
- . Information Systems Ethics and Crime
 - o Information Privacy, Accuracy, Property, and Accessibility
 - o Computer Crime
 - o Cyberwar / Cyberterrorism
- . Technology-Based Safeguards
- . Human-Based Safeguards
- . Audit and Compliance
- . Risk Management

1.8 Business Intelligence

- . Organizational Decision Making, Functions, and Levels
- . Information and Knowledge Discovery
(reporting, online analytical processing, data, text, and web mining, business analytics)
- . Application systems
 - o Executive, Managerial, and Operational Support Systems
 - o Decision Support Systems
 - o Functional Area Information Systems
 - o Intelligent Systems
 - o Knowledge Management Systems
 - o Enterprise Search
- . Information visualization (Visual Analytics, Dashboards, Geographic Information Systems)
- . Enterprise-Wide Information Systems
 - o Enterprise Resource Planning
 - o Supply Chain Management
 - o Customer Relationship Management



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1.9 Globalization

- Global Information Systems Strategies
- Technology Enabled Change and the Digital Divide
- Cultural, Ethnic and Political Challenges

2.0 Data and Information Management (15%)

This section covers the core concepts in data and information management using conceptual data modeling techniques. This section also includes coverage of basic database administration tasks and key concepts of data quality and data security.

2.1 Database Approach

- Types of Database Management Systems
- Basic File Processing Concepts
- Physical Data Storage Concepts
- File Organizations Techniques

2.2 Data Modeling

- Conceptual Data Model
- Entity-Relationship Model
- Object-Oriented Data Model
- Specific Modeling Grammars
- Enterprise Data Models
- Logical Data Model
 - o Hierarchical data model
 - o Network data model
 - o Relational data model (Relations, Relational Structures, Relational Database Design)
- Mapping conceptual schema to a relational schema
- Normalization
- Physical Data Model
 - o Indexing
 - o Data types

2.3 Database Languages

- SQL: DDL, DML, DCL

2.4 Data and Database

Administration . Data Stewardship

- . Meta Data
- . Database Administration (DBA)

2.5 Transaction Processing

- . Online Transaction Processing
- . Batch processing
- . Edits and validation
- . Transactions processing methods

2.6 Data / Information Architecture

- Database Management Systems
- Data Warehousing



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2.7 Data Security Management

- Basic Data Security Principles
- Data Security Implementation

2.8 Data Quality Management

- Data Quality Principles
- Data Quality Audits
- Data Quality Improvement

3.0 Enterprise Architecture (10%) This section covers the design, selection, implementation and management of enterprise IT solutions. The focus is on frameworks and strategies for infrastructure management, system administration, data/information architecture, content management, distributed computing, middleware, legacy system integration, system consolidation, software selection, total cost of ownership calculation, IT investment analysis, and emerging technologies.

3.1 Enterprise Architecture Frameworks

- Service Oriented Architecture
- Systems Integration
- Enterprise Resource Software
- The Role of Open Source Software
- Software As A Service
- Virtualization of Storage and Systems
- Data/Information Architecture and Data Integration

3.2 Monitoring and Metrics for Infrastructure and Business Processes

- . Scorecards
- . Variances

3.3 Green Computing

- . Power Consumption
- . Materials Recycling
- . Product Longevity
- . Telecommuting
- . Virtualization

3.4 Business continuity

- System Administration
- System Performance Analysis and Management
- IT Control and Management Frameworks

4.0 IT Infrastructure (15%) This section covers topics related to both computer and systems architecture and communication networks, with an overall focus on the services and capabilities that IT infrastructure solutions enable in an organizational context.

4.1 Systems Concepts

- Core Architectural Concepts (Grid Computing, Cloud Computing)
- Core System Organizing Structures
- Core Technical Components



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4.2 Operating Systems

- Core Operating Systems Functionality
- Internal Organization of an Operating System
- Types of Devices that Require and Use Operating Systems
- Operating System Configuration
- Securing an Operating System

4.3 Networking

- Types of Networks
- Core Network Components
- TCP/IP Model
 - o Physical Layer: Wired and Wireless Connectivity
 - o Data Link Layer: Ethernet
 - o Network Layer: IP, IP Addressing and Routing
 - o Transport Layer: TCP
 - o Application Layer: Core Internet Application Protocols
- Network Security and Security Devices
- Network Device Configuration
- Securing IT Infrastructure
 - o Principles of Encryption and Authentication
 - o Component Level Security (clients, servers, storage network devices, data transport, applications)
 - o Perimeter Security (firewalls, VPN's)
- 4.4 IT Control and Service Management Frameworks (COBIT, ITIL, CMMI etc.)
- Managing the Organizational IT Infrastructure

5.0 IS Project Management (15%) Project management in the modern organization is a complex team-based activity, where various types of technologies (including project management software as well as software to support group collaboration) are an inherent part of the project management process. This section focuses on a systematic methodology for initiating, planning, executing, controlling, and closing projects.

5.1 Introduction to Project Management

- Project Management Terminology
- Unique Features of IT Projects

5.2 The Project Management Lifecycle

- Project Management and Systems Development or Acquisition
- Technology and Techniques to Support the Project Management Lifecycle
- Project management processes

5.3 Managing Project Teams

- Project Team Planning
- Motivation, Leadership, Power and Conflict in Project Teams
- Managing Project Communication
- Using Collaboration Technologies to Enhance Team Communication



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5.4 Project Initiation and Planning

- Managing Project Scope
- Project Charters

5.5 Managing Project Scheduling

- Common Problems in Project Scheduling
- Techniques for Project Scheduling

5.6 Managing Project Resources

- Types of Resources (human, capital, time)
- Techniques for managing resources

5.7 Managing Project Quality and Risk

- Measures of Quality
- Threats to Project Quality
- Tools and Techniques for Managing Quality
- Tools and Techniques for Managing Risk

5.8 Systems Procurement

- Alternatives to Systems Development
- External Acquisition
- Outsourcing-Domestic and Offshore
- Managing the Procurement Process

5.9 Project Execution, Control and Closure

- Managing Project Execution
- Monitoring Progress and Managing Change
- Documentation and Communication
- Common Problems in Project Execution
- Cost Control
- Change Control
- Closing a Project (administrative, personnel, contractual)
- Project auditing

6.0 Systems Analysis & Design (15%) This section focuses on a systematic methodology for analyzing a business problem or opportunity, determining what role, if any, computer-based technologies can play in addressing the business need, articulating business requirements for the technology solution, specifying alternative approaches to acquiring the technology capabilities needed to address the business requirements, and specifying the requirements for an information systems solution.

6.1 Business Process Management

- Identification of Opportunities for IT-enabled Organizational Change
- Analysis of Business Requirements
- Business Process Modeling

6.2 Structuring of IT-based Opportunities into Projects

- Project Specification
- Project Prioritization
- Analysis of Project Feasibility
- Tangible Costs and Benefits (profit, productivity, competition)
- Intangible Costs and Benefits (good will, company image, employee morale)
- Legal, Technical and Cultural Considerations



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6.3 Analysis and Specification of System Requirements

- Data Collection Methods
- Methods for Structuring and Communicating Requirements
- Factors Affecting User Experience
- User Interface Design
- System Data Requirements
- Factors Affecting Security
- Ethical Considerations in Requirements Specification
- Special Requirements for Globalized Systems

6.4 Implementation Strategies

- Packaged Systems; Enterprise Systems
- Outsourced development
- In-house development
- Specifying Implementation Alternatives
- Methods for Comparing Systems Implementation Approaches
- Organizational Implementation Considerations

6.5 Design and Analysis

- Structured SDLC
- Unified Process/UML
- Agile Methods
- Implementation Factors

7.0 IS Strategy, Management & Acquisition (10%) This section focuses on the issues and approaches in managing the information systems function in organizations and how the IS function integrates / supports / enables various types of organizational capabilities.

7.1 The Role of IS in the Organization

- The IS Function
- IS Strategic Alignment
- Strategic Use of Information
- Impact of IS on Organizational Structure and Processes
- IS Economics
- IS Planning
- IS Leadership: The Role of the CIO and IS Management

7.2 Structuring the IS Organization

- Role of IS in Defining and Shaping Competition
- Managing the Information Systems Function
- Hiring, Retaining, and Managing IS Professionals
- Managing Internal and External Resources
- Determining Staffing Skills and Allocation Models
- Financing and Evaluating Information Technology Investments
- Measuring Quality and Cost of Operations
- Using IS/IT Governance Frameworks

7.3 Acquiring Information Technology Resources and Capabilities

- Acquiring Infrastructure Capabilities
- Sourcing Information Systems Services
- Sourcing Information Systems Applications