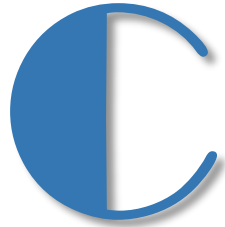




西安电子科技大学  
XIDIAN UNIVERSITY

Module



# 系统分析与设计

(SYSTEM ANALYSIS AND DESIGN)

## Course Review

# 本课程结构

Chapter 1 - Players in the Systems Game

Chapter 2 - Information System Building Blocks

Chapter 3 - Information Systems Development

Chapter 4 - Project Management

*The Context of  
Systems Analysis  
and Design*

Chapter 5 - Systems Analysis

Chapter 6 - Requirements Discovery

Chapter 7 - Data Modeling and Analysis

Chapter 8 - Process Modeling

Chapter 9 - Feasibility Analysis and the System Proposal

*Systems Analysis  
Methods*

Chapter 10 - Systems Design

Chapter 11 - Application Architecture and Modeling

Chapter 12 - Database Design

Chapter 13 - Output Design and Prototyping

Chapter 14 - Input Design and Prototyping

Chapter 15 - User Interface Design

*Systems Design  
Methods*

Module A - Object-Oriented Analysis and Modeling

Module B - Object-Oriented Design and Modeling

*Advanced Analysis  
and Design Methods*

# Chapter 1 - Players in the Systems Game

- What are information systems, and who are the stakeholders in the information systems game?
- What role will you personally play in the development and use of information systems?
- Who are information system users? How is the definition changing in a remote computing and Internet-centric world?
- What is a systems analyst and why are these individuals the key players in the development and implementation of information systems?
- What are systems analysis and design?
- Where do systems analysts work?
- What modern business and technology trends are affecting information systems development?
- What are the career prospects for systems analysts?
- If you want to pursue a career as a systems analyst, what knowledge and skills do you need to acquire?

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- What are the career prospects for systems analysts?
- If you want to pursue a career as a systems analyst, **what knowledge and skills do you need to acquire?**

## Chapter 2 - Information System Building Blocks

- Describe the difference between data and information.
- Define the product called an information system, and describe the role of information technology in information systems.
- Differentiate between front- and back-office information systems.
- Describe five classes of information system applications (transaction processing, management information, decision support, expert, and office automation systems) and how they interoperate.
- Describe the role of information systems architecture in system development.
- Name six groups of stakeholders in information system development.
- Name three focuses for information systems.
- Describe four perspectives of the DATA focus for an information system.
- Describe four perspectives of the PROCESS focus for an information system.
- Describe four perspectives of the INTERFACE focus for an information system.
- Describe the role of a computer network as it relates to DATA, PROCESSES, and INTERFACES.

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## Chapter 3 - Information Systems Development

- Describe the motivation for a system development process in terms of the Capability Maturity Model (CMM) for quality management.
- Differentiate between the system life cycle and a system development methodology.
- Describe eight basic principles of system development.
- Define problems, opportunities, and directives—the triggers for systems development projects.
- Describe the PIECES framework for categorizing problems, opportunities, and directives.
- Describe the traditional, basic phases of system development (FAST). For each phase, describe its purpose, inputs, and outputs.
- Describe cross life cycle activities that overlap all system development phases.
- Describe four basic alternative “routes” through the basic phases of system development. Describe how routes may be combined or customized for different projects.
- Differentiate between computer-aided systems engineering (CASE), application development environments (ADEs), and process and project management technology as automated tools for system development.

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## Chapter 4 - Project Management

- Define the terms project and project management, and differentiate between project and process management.
- Describe the causes of failed information systems and technology projects.
- Describe the basic competencies required of project managers.
- Describe the basic functions of project management.
- Differentiate between PERT and Gantt charts as project management tools.
- Describe the role of project management software as it relates to project management tools.
- Describe eight activities in project management.
- Define joint project planning and its role in project management.
- Define scope and write a statement of work to document scope.
- Use a work breakdown structure to decompose a project into tasks.
- Estimate tasks' durations, and specify intertask dependencies on a PERT chart.
- Assign resources to a project and produce a project schedule with a Gantt chart.
- Assign people to tasks and direct the team effort.
- Use critical path analysis to adjust schedule and resource allocations in response to schedule and budget deviations.
- Manage user expectations of a project and adjust project scope.

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## Chapter 5 - Systems Analysis

- Define systems analysis and relate the term to the preliminary investigation, problem analysis, requirements analysis, and decision analysis phases of the systems development methodology.
- Describe a number of systems analysis approaches for solving business system problems.
- Describe the preliminary investigation, problem analysis, requirements analysis, and decision analysis phases in terms of your information system building blocks.
- Describe the preliminary investigation, problem analysis, requirements analysis, and decision analysis phases in terms of purpose, participants, inputs, outputs, techniques, and steps.
- Identify those chapters and modules in this textbook that can help you learn specific systems analysis tools and techniques.

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## Chapter 6 - Requirements Discovery

- Define system requirements and differentiate between functional and nonfunctional requirements.
- Understand the activity of problem analysis and be able to create an Ishikawa (fishbone) diagram to aid in problem solving.
- Understand the concept of requirements management.
- Identify seven fact-finding techniques and characterize the advantages and disadvantages of each.
- Understand six guidelines for doing effective listening.
- Understand what body language and proxemics are, and why a systems analyst should care.
- Characterize the typical participants in a JRP session and describe their roles.
- Complete the planning process for a JRP session, including selecting and equipping the location, selecting the participants, and preparing an agenda to guide the JRP session.
- Describe several benefits of using JRP as a fact-finding technique.
- Describe a fact-finding strategy that will make the most of your time with end-users.
- Describe various techniques to document and analyze requirements.
- Understand use cases and be able to document them.

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## Chapter 7 - Data Modeling and Analysis

- Define systems modeling and differentiate between logical and physical system models.
- Define data modeling and explain its benefits.
- Recognize and understand the basic concepts and constructs of a data model.
- Read and interpret an entity relationship data model.
- Explain when data models are constructed during a project and where the models are stored.
- Discover entities and relationships.
- Construct an entity-relationship context diagram.
- Discover or invent keys for entities and construct a key-based diagram.
- Construct a fully attributed entity relationship diagram and describe all data structures and attributes to the repository or encyclopedia.
- Normalize a logical data model to remove impurities that can make a database unstable, inflexible, and nonscalable.
- Describe a useful tool for mapping data requirements to business operating locations.

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## Chapter 8 - Process Modeling

- Define systems modeling and differentiate between logical and physical system models.
- Define process modeling and explain its benefits.
- Recognize and understand the basic concepts and constructs of a process model.
- Read and interpret a data flow diagram.
- Explain when to construct process models and where to store them.
- Construct a context diagram to illustrate a system's interfaces with its work environment.
- Identify use cases, external and temporal business events for a system.
- Perform event partitioning and organize events in a functional decomposition diagram.
- Draw event diagrams and merge those events into a system diagram.
- Draw primitive data flow diagrams and describe the elementary data flows and processes in terms of data structures and procedural logic (Structured English and decision tables), respectively.
- Document the distribution of processes to locations.
- Synchronize data and process models using a CRUD matrix.

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## Chapter 9 - Feasibility Analysis and the System Proposal

- Identify feasibility checkpoints in the systems life cycle.
- Identify alternative system solutions.
- Define and describe four types of feasibility and their respective criteria.
- Perform various cost-benefit analyses using time-adjusted costs and benefits.
- Write suitable system proposal reports for different audiences.
- Plan for a formal presentation to system owners and users.

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## Chapter 10 - Systems Design

- Describe the design phase in terms of your information building blocks.
- Identify and differentiate between several systems design strategies.
- Describe the design phase tasks in terms of a computer-based solution for an in-house development project.
- Describe the design phase in terms of a computer-based solution involving procurement of a commercial systems software solution.

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# Chapter 11 - Application Architecture and Modeling

- Define an information system's architecture in terms of Data, Processes, and Interfaces—the building blocks of all information systems. Consistent with modern trends, these building blocks will be distributed across a network.
- Differentiate between logical and physical data flow diagrams, and explain how physical data flow diagrams are used to model an information system's architecture.
- Describe both centralized and distributed computing alternatives for information system design, including various client/server and Internet-based computing options.
- Describe database and data distribution alternatives for information system design.
- Describe user and system interface alternatives for information system design.
- Describe various software development environments for information system design.
- Describe strategies for developing or determining the architecture of an information system.
- Draw physical data flow diagrams for an information system's architecture and processes.

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## Chapter 12 - Database Design

- Compare and contrast conventional files and modern, relational databases.
- Define and give examples of fields, records, files, and databases.
- Describe a modern data architecture that includes files, operational databases, data warehouses, personal databases, and work group databases.
- Compare the roles of systems analysts, data administrators, and database administrators as they relate to database and database design.
- Describe the architecture of a database management system
- Describe how a relational database implements entities, attributes, and relationships from a logical data model.
- Transform a logical data model into a physical, relational database schema.
- Generate SQL code to create the database structure in a schema.

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## Chapter 13 - Output Design and Prototyping

- Distinguish between internal, external, and turnaround outputs.
- Differentiate between detailed, summary, and exception reports.
- Identify several output implementation methods.
- Differentiate among tabular, zoned, graphic, and narrative formats for presenting information.
- Distinguish among area, bar, column, pie, line, radar, donut, and scatter charts and their uses.
- Describe several general principles that are important to output design.
- Design and prototype computer outputs.

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## Chapter 14 - Input Design and Prototyping

- Define the appropriate format and media for a computer input.
- Explain the difference between data capture, data entry, and data input.
- Identify and describe several automatic data collection technologies.
- Apply human factors to the design of computer inputs.
- Design internal controls for computer inputs.
- Select proper screen-based controls for input attributes that are to appear on a GUI input screen.
- Design a web-based input interface.

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## Chapter 15 - User Interface Design

- Distinguish between different types of computer users and design considerations for each.
- Identify several important human engineering factors and guidelines and incorporate them into a design of a user interface.
- Integrate output and input design into an overall user interface that establishes the dialogue between users and computer.
- Understand the role of operating systems, Web browsers, and other technologies for user interface design.
- Apply appropriate user interface strategies to an information system. Use a state transition diagram to plan and coordinate a user interface for an information system.
- Describe how prototyping can be used to design a user interface.

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# Module A - Object-Oriented Analysis and Modeling

- Define object modeling and explain its benefits.
- Recognize and understand the basic concepts and constructs of an object model.
- Read and interpret an object model.
- Describe object modeling in the context of systems analysis.
- Explain the Unified Modeling Language (UML) and list its diagrams.
- Construct a use case model.
- Discover objects and classes, and their relationships.
- Construct an object class diagram.
- Construct a state diagram to model an object's behavior.

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## Module B - Object-Oriented Design and Modeling

- Differentiate between entity, interface, and control objects.
- Understand the basic concept object responsibility and how it is related to message sending between object types.
- Explain the importance of considering object reuse during systems design.
- Describe three activities involved in completing object design.
- Construct an ideal object model diagram, CRC card, and sequence diagram.
- Construct a design object class diagram.
- Identify activity and implementation diagrams.

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**谢谢大家！**