SYSTEM ANALYSIS AND DESIGN

UNIT CODE: IT/CU/ICT/CR/12/6

Relationship to Occupational Standards
This unit addresses the competency: **System Analysis And Design**

Duration of Unit: 180 Hours

Unit Description:
This unit specifies competencies required to develop computer program. It involves understanding of System Analysis and Design fundamentals, understanding approaches to system Development and Project planning, Performing System Analysis, identify Essentials of System Design, understand advanced Design Concepts, Perform System implementation and Understand Current Trends in System Development.

Summary of Learning Outcomes:
1. Understand System Analysis and Design Fundamentals
2. Understand Approaches to system Development and Project planning.
3. Perform System Analysis
4. Identify Essentials of System Design
5. Understand advanced Design Concepts
6. Perform System Implementation
7. Understand Current Trends in System Development

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
Understand System Analysis and Design Fundamentals	❑ Define system, system design and system analysis ❑ Constrains of system ✓ Interconnectivity ✓ Objectives of organization ❑ Properties of a system ✓ Organization ✓ Interaction ✓ Interdependence ✓ Integration	• Practical exercises with observation checklist • Oral questioning • Written test •

	❑ Elements of a system ✓ Control ✓ Input ✓ Process ✓ Output ❑ Classification of systems ❑ Types of Information system ✓ Physical ✓ Open or closed ✓ Adaptive and non-adaptive ✓ Permanent and temporary ❑ System models ✓ Schematic ✓ Flow system ✓ Static system ✓ Dynamic system ❑ Categories of Information ✓ Strategic ✓ Management ✓ Operational	
Understand Approaches to system Development and Project planning.	❑ System development Approaches ❑ System development methodologies ❑ System development life cycle models ❑ Activities involved in SDLC ❑ SDLC phases ❑ Project planning concepts	• Practical • Project • Observation • Written test
Perform System Analysis	❑ Overview of system Analysis ❑ Role of a system Analyst ❑ Attributes of structured analysis ✓ Graphic ✓ Logical ✓ Process division ✓ High level to lower level approach ❑ Tools for system analysis ✓ Data Flow Diagrams ✓ Data Dictionary ✓ Decision Trees ✓ Decision Tables	• Practical exercises • Oral questioning • Written test

	✓ Structured English ✓ Pseudocode Activities performed during System analysis ✓ Gather detailed Information ✓ Define requirements ✓ Prioritize requirements ✓ Develop user-interface dialogs ✓ Evaluate requirement with users ✓ Define functional requirements	
Identify Essentials of System Design	❑ Design with Software specification requirements (SRS) document ❑ Components of system design ✓ Quality ✓ Timeliness ✓ Cost-Effectiveness ❑ Inputs ✓ Statement of work ✓ Requirement determination plan ✓ Current situation analysis ✓ Proposed system requirements including a conceptual data model, modified DFDs, and Metadata (data about data) ❑ Outputs ✓ Infrastructure and organizational changes for the proposed system. ✓ A data schema, often a relational schema. ✓ Metadata to define the tables/files and columns/data-items. ✓ A function hierarchy diagram or web page map that graphically describes the program structure. ✓ Actual or pseudocode for each module in the program.	• Practical exercises • Oral questioning

	✓ A prototype for the proposed system ❑ Stages of system design ✓ Requirements determination ✓ Requirements specifications ✓ Feasibility Analysis ✓ Final Specifications ✓ Hardware study ✓ System Design ❑ Types of system design ✓ Logical ✓ Physical ✓ Architectural ✓ Detailed ❑ Data Modelling techniques ✓ Conceptual ✓ Relational ✓ Object Oriented	
Understand advanced Design Concepts	❑ Types of Advance Design modelling ❑ File Organization Methods ✓ Serial ✓ Sequential ✓ Direct ✓ Indexed ❑ File access methods ✓ Sequential ✓ Direct ❑ System security Control ✓ Privacy ✓ Integrity ❑ System Control Measures ✓ Backup ✓ Physical Access ✓ Logical ❑ Structured Design Concepts ✓ Input ✓ Output ✓ User interface ✓ Modularization	• Practical exercises • Oral questioning • Written test •
Perform System Implementation	❑ System implementation procedures ✓Program Development	•

	✓Quality Assurance ✓Data Conversion ❑ Types of the system testing ✓Software ✓Unit ✓Integration ✓Usability ❑ Deployment procedures of the system ✓Installation ✓Documentation ✓Training ✓Maintenance	
Understand Current Trends in System Development	❑ Frameworks, components and services are identified ✓ Object Frameworks ✓ Component standards and infrastructure ✓ Service Standards ❑ Model driven architecture is understood ✓ MDA Approach ✓ MDA tools ❑ Adaptive methodologies to development are understood ✓ Agile Software Development ❑ Software principles and practices are identified ✓ Abstraction ✓ Models and Modelling ✓ Patterns ✓ Reuse ✓ Methodologies	•

Suggested Methods of Delivery

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;

The delivery may also be supplemented and enhanced by the following, if the opportunity allows:

- Visiting lecturer/trainer from the ICT sector;
- Industrial visits.

Recommended Resources

Tools ✓ Data Flow Diagrams ✓ Data Dictionary ✓ Decision Trees ✓ Decision Tables ✓ Structured English
Equipment • Computer • Software • Mobile phones • Tablets •
Materials and supplies Digital instructional material including DVDs and CDs
Reference materials Appropriate Mobile Application Development text books