

SYSTEM ANALYSIS AND DESIGN

ISCED UNIT CODE: 0613 541 02A

TVET CDACC UNIT CODE: IT/CU/ICTA/CC/02/6/MA

Duration of Unit: 110 Hours

Relationship to Occupational Standards

This unit addresses the unit of competency: Perform System Analysis and Design

Unit description

This unit covers the competencies required to perform system analysis and design. It involves applying System Analysis and Design concepts, applying approaches to system Development and Project planning, Performing System Analysis, Performing System Design, Performing System Testing, Performing System Implementation and Maintenance.

Summary of Learning Outcomes

Learning Outcomes	DURATION (HOURS)
1. Apply System Analysis and Design concepts	10
2. Apply approaches to system Development and Project planning.	20
3. Perform System Analysis	20
4. Perform System Design	20
5. Perform system testing	10
6. Perform System Implementation	20
7. Perform system maintenance	10
Total hours	110

Learning outcomes, Content and Suggested Assessment Methods

Learning outcomes	Content	Suggested Assessment Methods
1. Apply System Analysis and Design concepts	1.1 Identification of system standard constraints 1.1.1 Introduction to system standards constraints 1.1.2 Types of system standards constraints 1.2 Properties of a system 1.2.1 Organisation 1.2.2 Interaction 1.2.3 Interdependence 1.2.4 Integration 1.3 Elements of a system 1.3.1 Control 1.3.2 Input 1.3.3 Process 1.3.4 Output 1.3.5 Feedback 1.3.6 Environment 1.4 System classification 1.4.1 Open system 1.4.2 Closed system 1.4.3 Adaptive system 1.4.4 Non adaptive system 1.4.5 Deterministic system 1.4.6 Probabilistic system 1.5 Types of information systems 1.5.1 Management information system 1.5.2 Transaction processing system 1.5.3 Decision support system	• Project • Practical exercises • Written assessments • Observation • Case study • Checklist

	1.5.4 Office automation system 1.5.5 Executive support system 1.5.6 Expert system 1.5.7 Knowledge management system 1.5.8 Human resource system 1.6 identification of system models 1.6.1 Physical models 1.6.2 Logical models 1.7 Categories of information 1.7.1 Lower Level 1.7.2 Middle Level 1.7.3 Top Level 1.8 System Analysis and design Concepts	
2. Apply approaches to system Development and Project planning.	2.1 System development Approaches 2.1.1 System development methodologies 2.2 System development life cycle models 2.2.1 Waterfall 2.2.2 Prototyping 2.2.3 Dynamic system Development model (DSDM) 2.2.4 Object oriented model 2.3 SDLC activities 2.3.1 Process and procedure development 2.3.2 Change management 2.3.3 User experience identification 2.3.4 User impact	• Project • Practical exercises • Written assessments • Observation • Case study • Checklist

	2.3.5 Security procedures 2.4 SDLC phases 2.4.1 Planning 2.4.2 Analysis 2.4.3 Design 2.4.4 Testing 2.4.5 Implementation 2.4.6 Maintenance 2.5 Project planning concepts 2.5.1 Introduction to project planning concepts 2.5.1.1 Objectives Resources 2.5.1.2 Schedule 2.5.1.3 Constraints 2.5.1.4 Risks 2.5.1.5 Deliverables 2.5.2 Project planning tools and techniques 2.5.2.1 Program Evaluation and Review Technique 2.5.2.2 Critical Path Methods 2.5.2.3 Gantt charts 2.5.2.4 Risk management tools 2.5.2.5 Budgeting and cost estimation tools 2.5.2.6 Work breakdown structures	
3. Perform System Analysis	3.1 Overview of system Analysis 3.1.1 Role of a system Analyst 3.2 Attributes of structured analysis 3.2.1 Graphic 3.2.2 Logical	• Project • Practical exercises • Written assessments

	3.2.3 Process division 3.2.4 High level to lower-level approach 3.3 Tools and techniques for system analysis 3.3.1 System analysis tools 3.3.1.1 Pseudocode 3.3.1.2 Structured English 3.3.1.3 Decision Trees 3.3.1.4 Decision Tables 3.3.1.5 Data Flow Diagrams 3.3.1.6 Data Dictionary 3.3.2 System analysis techniques 3.3.2.1 Structured analysis 3.3.2.2 Object-oriented analysis 3.3.2.3 Cost benefits analysis 3.3.2.4 Gap analysis 3.3.2.5 Risk analysis 3.4 Performing System analysis activities	• Observation • Case study • Checklist
4. Perform System Design	4.1 Design with Software specification requirements (SRS) document 4.2 Components of system design 4.2.1 Quality 4.2.2 Timeliness 4.2.3 Cost-Effectiveness 4.3 Inputs and outputs of System Design 4.3.1 Inputs of System Design 4.3.1.1 Statement of work 4.3.1.2 Requirement determination plan 4.3.1.3 Current situation analysis	• Project • Practical exercises • Written assessments • Observation • Case study • Checklist

	4.3.1.4 Proposed system requirements including a conceptual data model, modified DFDs, and Metadata (data about data) 4.3.2 Outputs of System Design 4.3.2.1 Infrastructure and organizational changes for the proposed system. 4.3.2.2 A data schema, often a relational schema. 4.3.2.3 Metadata to define the tables/files and columns/data-items. 4.3.2.4 A function hierarchy diagram or web page map that graphically describes the program structure. 4.3.2.5 Actual or pseudocode for each module in the program. 4.3.2.6 A prototype for the proposed system 4.3.2.7 User interface 4.3.2.8 Modularization 4.4 Types of system design 4.4.1 Logical 4.4.2 Physical 4.4.3 Architectural 4.4.4 Detailed 4.5 Stages of system design 4.5.1 Requirements determination	
--	--	--

	4.5.2 Requirements specifications 4.5.3 Feasibility Analysis 4.5.4 Final Specifications 4.5.5 Hardware study 4.5.6 System Design 4.6 Data Modelling techniques 4.6.1 Conceptual 4.6.2 Relational 4.6.3 Object Oriented 4.6.4 Logical 4.6.5 Dataflow diagrams	
5. Perform system testing	5.1 Types of the system testing 5.1.1 Software 5.1.2 Unit 5.1.3 Integration 5.1.4 Usability 5.1.5 Importance of system testing 5.2 System debugging 5.2.1 Common system debugging techniques 5.2.2 System debugging procedure 5.3 Performing system settings 5.4 Developing system testing report	• Project • Practical exercises • Written assessments • Observation • Case study • Checklist
6. Perform System Implementation	6.1 System implementation methods 6.1.1 Direct 6.1.2 Phased 6.1.3 Piloting 6.1.4 parallel 6.2 Selecting appropriate implementation methods 6.2.1 Factors to consider when selecting system implementation methods	• Project • Practical exercises • Written assessments • Observation • Case study • Checklist

	6.3 Prerequisite implementation procedures 6.3.1 User training 6.3.2 data conversion 6.3.3 hardware/software acquisition 6.3.4 personnel recruitment 6.4 System deployment 6.4.1 System installation 6.4.2 System documentation 6.4.3 Training	
7. Perform system maintenance	7.1 System review 7.1.1 Introduction to system review and maintenance 7.1.2 Importance of system maintenance 7.2 Performing system maintenance 7.2.1 Types of system maintenance 7.2.2 System maintenance procedures and policies 7.3 System maintenance report 7.3.1 Components of system maintenance report 7.3.2 Importance of system maintenance report 7.3.3 Preparation of System maintenance report	• Project • Practical exercises • Written assessments • Observation • Case study • Checklist

Suggested Delivery Methods

- Demonstration by trainer
- Practical work by trainee

- Viewing of related videos
- Group discussions
- Direct instructions

Recommended resources for 25 trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Trainee: Item)
A	Learning Materials			
1.	Textbooks		5 pcs	5:1
2.	Handouts			
3.	PowerPoint presentations	For trainer's use		
4.	Assorted colour of whiteboard markers	For trainer's use	2 packets	
5.	e-Didactics	For trainer's use		
6.	Flashcards			
7.	Flip charts			
8.	Whiteboard			
B	Learning Facilities & infrastructure			
9.	Lecture/theory room		1	25:1
C	Consumable materials			
10.	Printing Papers		1 ream	1:20
11.	Toners		2 pcs	13:1
12.	Internet			

13.	Graph papers		1 ream	1:5
D	Tools and Equipment			
14.	Projectors		1	25:1
15.	Printers		4	6:1
16.	Computers/Smartphones		25 pcs	1:1