

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: STRUCTURED ANALYSIS
Code No.: CET 125-3
Program: COMPUTER ENGINEERING TECHNOLOGY
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STRUCTURED ANALYSIS

SPECIFIC OBJECTIVES

BLOCK 1 - DATA FLOW DIAGRAMS

1. Overview of the analysis process.

At the end of this section the student shall be able to describe the general stages of the analysis of a system and how the analysis stage relates to the overall development of a system. The student shall be able to describe the functions of the following tools in the analysis:

- a) Data flow diagrams
- b) Data dictionaries
- c) Techniques of defining logic including:
 - 1) Decision trees
 - 2) Decision Tables
 - 3) Structured English

2. Drawing Data Flow Diagrams.

At the end of this section the student shall be able to:

- a) Define the symbols used in drawing DFD's.
- b) Discuss the conventions used when exploding DFD's.
- c) Describe the techniques for dealing with exceptions and errors.
- d) Describe the steps involved in drawing DFD's.
- e) Describe the difference between data flow and material flow and how to describe them.
- f) Apply the techniques to system analysis.

BLOCK 2 Building and using a Data Dictionary

At the end of this block the student shall be able to:

a) Describe the three levels at which we can describe data:

1. Data elements
2. Data structures
3. Data flows and data stores

b) Discuss the considerations involved in describing:

1. Data elements
2. Data structures
3. Data flows
4. Data stores
5. Processes
6. External entities

c) Discuss the uses that may be made of a Data Dictionary.

BLOCK 3 Analyzing and Describing Process Logic

At the end of this block the student shall be able to discuss and use the following logical tools:

1. Decision trees
2. Decision tables
3. Structured ENGLISH
4. Pseudocode
5. Tight ENGLISH

BLOCK 4-DEFINING THE CONTENTS OF DATA STORES

At the end of this block the student shall be able to:

1. Discuss the advantages and disadvantages of complicated file structures with as much data as possible in each record, and simpler file structures.
2. Define the term NORMALIZATION as applied to data stores.
3. Describe the three NORMAL forms of data store.
4. Normalize a given data store into each of the normal forms.

BLOCK V STRUCTURED DESIGN TECHNIQUES

At the end of this block the student shall be able to:

1. Discuss the factors of performance, control, and changeability that must be considered when designing a system.
2. Develop hierarchy charts to describe systems, and describe the difference between transform-centered and transaction-centered hierarchies.
2. Discuss the concepts of coupling, cohesion, and binding of modules.
3. Discuss the concepts of scope of control and scope of effect.
4. Apply the techniques to designing a system from a DATA FLOW DIAGRAM.

STRUCTURED ANALYSIS

TEST

MARKS	QUESTION
5	1. List five steps in the analysis process.
5	2. What are three techniques used to define the . of processes.
10	3. Draw and describe the use of the different symbols used to draw DATA FLOW DIAGRAMS.
10	4. List 10 steps that might be followed when developing a Data Flow Diagram of a process.
20	5. You have just accepted the job of analyzing the complaints department of Woolco. Draw the first draft of your DFD, and explain some of the things you would want to consider.

STRUCTURED ANALYSIS

TEST

1. Briefly describe the different stages that occur during the analysis of a system.
2. The following is a company's policy on charges for shipping, and the answers to some questions concerning the policy:

Air shipping charges are set depending on the weight of the parcel. The basic rate is 3 units per pound, reducing to 2 units per pound for excess over 20 pounds, with a minimum of 6 units. Surface freight(including handling) is 2 units per pound for express delivery; however, this rate applies only in the local delivery area. If the shipping address is outside the local area and the parcel weighs over 20 pounds or express delivery is not required, the surface rate is the same as for local delivery express. Normal delivery of packages up to 20 pounds is three units per pound with a 1-unit express surcharge(per pound).

Notwithstanding the provisions of the previous paragraph, air freight to destinations west of the Mississippi is charged at double rates.

Q. Is the "basic rate" referred to for air or for surface?

A. Air.

Q. What is the local area.

A. Anywhere within the city limits.

a) Draw a decision tree illustrating how a customer's freight charges would be determined.

b) Draw a decision table.

c) Draw a flowchart.

d) Write IF structures to implement the decisions.

3. What are the basic structures we deal with in structured programming.

4. What is the difference between pseudocode and structured English.

5. Your marks are submitted to the Chairman's office for each course by the course instructor. The chairmen verify the marks and send them to the Registrar's office if they are O.K. If there is a problem such as no mark, illegible mark etc. the Chairman will consult the instructor. When all the marks have been submitted to the registrar's office, they are sorted by program, and files for each program are created. These are sent to the computer center which prepares the transcripts.

a) Draw the first draft of a DFD for this system.

b) What files might be needed.

6. What is the purpose of a DATA DICTIONARY, and what should it contain.

STRUCTURED ANALYSIS

TEST 3

1. Briefly describe the three levels at which we can describe data, and the differences between them. Give examples.
2. What are some of the things we might wish to record about a data element in our data dictionary.
3. List 4 uses we might have for a data dictionary.

STRUCTURED ANALYSIS

TEST 5

1. What is meant by the term normalization of a data store.
2. What is the advantage of having as much information as possible on each record of a file, as compared to splitting the information among a number of simpler files? What is a disadvantage.
3. Briefly describe the three normal forms.
4. Describe how you would normalize the following ACCOUNTS RECEIVABLE file:

ORGANIZATION I-D

Billing Address

Date account opened

INVOICE*(1-)

 Invoice no.

 invoice date

 invoice amount

PAYMENT*(0-)

 cheque #

 payment date

 payment-amount

Balance outstanding

Number of orders to date

STRUCTURED ANALYSIS

TEST

1. List three things used to indicate the performance of a system.
2. Discuss the steps a designer should follow when designing a system.
3. Discuss the terms "coupling" and "cohesion".
4. Assume you are responsible for writing a program to produce transcripts of marks for each student in your class. Also assume that there is a file with the name of your class containing a record for each student with the names of the courses he/she takes. There is also a file for each course containing a list of student names and their marks in that course. The report should contain a list of courses, marks, and an average for each student, as well as the class average. Draw a hierarchy chart with four levels of development for this system.

STRUCTURED ANALYSIS

TEST

1. List three things used to indicate the performance of a system.
2. Describe the difference between a TRANSFORM-CENTERED and a TRANSACTION-CENTERED hierarchy.
3. Discuss the terms "coupling" and "cohesion".
4. Assume you are responsible for writing a program to produce transcripts of marks for each student in your class. Also assume that there is a file with the name of your class containing a record for each student with the names of the courses he/she takes. There is also a file for each course containing a list of student names and their marks in that course. The report should contain a list of courses, marks, and an average for each student, as well as the class average. Draw a hierarchy chart with four levels of development for this system.