

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: SOFTWARE ENGINEERING
Code No.: CET 305-6
Program: COMPUTER ENGINEERING
Semester: FIVE
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Author: PETER SAVICH

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APPROVED: *L.P. Chazotte* 85-12-05
Chairperson Date

CALENDAR DESCRIPTION

SOFTWARE ENGINEERING

Course Name

CET 305-6

Course Number

PHILOSOPHY/GOALS:

To provide the student with a professional approach and attitude towards software development.

The goal is to provide a basis whereby the computer engineering technology student can provide effective engineering performance in the industrial environment.

METHOD OF ASSESSMENT (GRADING METHOD):

TEXTBOOK(S):

"Software Engineering" by Randall W. Jensen, 1979, Prentice-Hall Inc.

"Structural Analysis and System Specifications" by Tom DeMarco, 1981, Youdon Inc.

" Software Engineering Concepts. By Richard Fairley 1985

CET 305 SOFTWARE ENGINEERING

OBJECTIVE OF COURSE

TO PROVIDE THE STUDENT WITH A PROFESSIONAL APPROACH AND ATTITUDE TOWARDS SOFTWARE DEVELOPMENT.

GOAL IS TO PROVIDE A BASIS WHEREBY THE COMPUTER ENGINEERING TECHNOLOGY STUDENT CAN PROVIDE EFFECTIVE ENGINEERING PERFORMANCE IN THE INDUSTRIAL ENVIRONMENT.

MEASUREABLE STUDENT ATTRIBUTES TO BE INCREASED AND AUGMENTED:

- COMMUNICATION SKILLS BOTH WRITTEN AND ORAL
- MANAGEMENT AND ORGANIZATIONAL AWARENESS
- COMPUTER SCIENCE/TECHNICAL SKILLS AND KNOWLEDGE

EMPHASIS ON STUDENTS:

TO UNDERSTAND EMPLOYER-EMPLOYEE RELATIONSHIPS
IMPORTANCE OF POSITIVE WORK RECORD

THE OBJECTIVES ARE TO MET BY SEVERAL PLANNED CATEGORIES OF LESSONS SYNERGISTICALLY PROVIDING THE STUDENT WITH A WELL ROUNDED EDUCATION.

SPECIFICALLY:

1. INTRODUCE CONCEPTS:

- A) SYSTEM DESIGN AND DESIGN METHODOLOGY
- B) PROJECT MANAGEMENT AND PROJECT PLANNING

2. CLASS PROJECT:

ELECTRICAL NETWORK COMPUTER ANALYSIS PROGRAM
ECAP IS A COMPUTER AIDED DESIGN (CAD) PACKAGE
CAPABLE OF DEVELOPMENT IN HOUSE BY CET 5TH
SEMESTER STUDENTS.

PROJECT PROVIDES THE STUDENT WITH PRACTICAL EXPERIENCE

IN COMPUTER ENGINEERING, CLIENT-CONSULTANT RELATIONSHIP,
AND SIMULATED WORK ENVIRONMENT.

ADDITIONAL EXPOSURE WITHIN CLASS PROJECT IN:

- ORGANIZATIONAL STRUCTURE
- COMMUNICATION CHANNELS/ LINKS
- ORGANIZATIONAL BEHAVIOUR

3. REINFORCE LAB AND CLASS PROJECT TIME WITH LECTURE TOPICS:

- SOFTWARE DESIGN
- STRUCTURAL PROGRAMMING
- VERIFICATION AND VALIDATION
- SECURITY AND PRIVACY
- LEGAL ASPECTS OF SOFTWARE DEVELOPMENT

4. DEVELOPMENT OF INDIVIDUAL STUDENTS PRESENTATION SKILLS

- DEVELOP ORAL COMMUNICATION SKILLS
- DEVELOP WRITTEN COMMUNICATION SKILLS
- (EXAMPLE: TECHNICAL REPORT WRITING
PROGRESS REPORT WRITING)

DEVELOPMENT OF INDIVIDUAL STUDENT TECHNICAL SKILLS AND
KNOWLEDGE:

- SPECIFICALLY : NETWORK ANALYSIS
- COMPUTATIONAL ANALYSIS
- COMPUTER GRAPHICS
- SYSTEM SOFTWARE/HARDWARE

EVALUATION PROCEDURE

WRITTEN TESTS GIVEN AS NECESSARY
TESTS WILL BE ANNOUNCED IN ADVANCE AND OPEN BOOK
WILL CONSTITUTE 25% OF FINAL MARK

2. WITHIN LABS AND LECTURES ATTENDANCE AND PARTICIPATION RATES WILL BE MONITORED.
ATTENDANCE AND HEALTHY PARTICIPATION BY ALL CLASS MEMBERS WILL ENSURE SUCCESS OF PROJECT ECAP.
3. PRESENTATION SKILLS WILL BE ASSESSED ON REQUIRED MATERIALS FOR EACH INDIVIDUAL.
ASSESSMENT BASED ON CLARITY, CONCISENESS, PRECISENESS, KNOWLEDGE LEVEL, USE OF VISUAL PRESENTATION AIDS, AND LOGICAL PRESENTATION OF INFORMATION.
WILL CONSTITUTE 25% OF FINAL MARK
4. PROJECT ECAP RESULTS
 - A) DEMONSTRATE INDIVIDUAL ABILITY TO PERFORM DESIGN METHODOLOGY TO ACHIEVE A USEFUL PRODUCT ECONOMICALLY
 - B) ABILITY TO PRESENT:
 - PLAN OF ATTACK
 - WALK THROUGHS WITH PEER GROUPS
 - FORMULATED PROJECT PLAN
 - C) DEMONSTRATE LEADERSHIP ABILITIES AND COMPLETE ASSIGNED TASKS.
 - D) DEMONSTRATE COMMUNICATION SKILLS, MANAGEMENT ORGANIZATIONAL AWARENESS, DEVELOP INTER-PERSONAL SKILLS.

WILL CONSTITUTE 25% OF FINAL MARK
5. SELF-EVALUATION BY INDIVIDUAL STUDENTS
AS TO PERFORMANCE DURING COURSE.
PERTAINING TO ECAP PROGRAM, PRESENTATION SKILLS PARTICIPATION IN LABS & LECTURES
THIS IS A SUGGESTED METHOD OF EVALUATION.
WILL BE SUBMITTED BY STUDENTS THEMSELVES
WILL CONSTITUTE 25% OF FINAL MARK.

PURPOSE OF COURSE IS TO PROVIDE A BASIS FOR THE COMPUTER ENGINEERING TECHNOLOGY STUDENT TO UNDERSTAND EFFECTIVE ENGINEERING PERFORMANCE IN THE INDUSTRIAL ENVIRONMENT.

CEY305 FINAL TEST

JANUARY 18, 1985

TYPE OF QUESTIONS ASKED:

MULTIPLE CHOICE
TRUE AND FALSE
FILL IN THE BLANK

THERE ARE OVER 90 QUESTIONS COVERING THE WHOLE COURSE

(FROM CHAPTERS 4, 5, 6 AND 7 AND LECTURES INDEPENDENT OF TEXT)

EACH LECTURE DATE IS IDENTIFIED AND CORRESPONDING QUESTIONS
FROM THAT LECTURE ARE ASKED.

THE STUDENT IS EXPECTED TO ANSWER A QUESTION FROM EACH LECTURE

THE MORE QUESTIONS A STUDENT ANSWERS WITHIN THE LECTURE THE HIGHER THE MARK
FAILURE TO ATTEMPT AT LEAST ONE QUESTION FROM EACH LECTURE RESULTS IN A
FAILING MARK

NOVEMBER 4, 1984

1. PRIMARY GOALS OF STRUCTURED PROGRAMMING ARE:

A) TO MINIMIZE THE NUMBER OF ERRORS THAT OCCUR DURING THE DEVELOPMENT PROCESS.

B) TO MINIMIZE THE EFFORT REQUIRED TO CORRECT ERRORS.

C) TO REPLACE SECTIONS WHEN MORE RELIABLE, FUNCTIONAL, OR EFFICIENT TECHNIQUES ARE DISCOVERED.

D) TO MINIMIZE THE LIFE CYCLE COSTS OF SOFTWARE.

E) REDUCE THE SOFTWARE COMPLEXITY.

2. THE BENEFITS OF REDUCING PROGRAM COMPLEXITY INCLUDE:

A) FEWER TESTING PROBLEMS

B) INCREASED PROGRAMMER PRODUCTIVITY

C) IMPROVED PROGRAM CLARITY

D) IMPROVED PROGRAM MAINTAINABILITY

E) IMPROVED PROGRAM MODIFIABILITY

NOVEMBER 5, 1984

3. STRUCTURED PROGRAMMING: (MARK TRUE OR FALSE)

A) EMPHASIZES THAT THE PROGRAM MUST BE OBTAINED THROUGH THE
PROCESS OF STEPWISE REFINEMENT.

FALSE B) IS SIMPLY CONVERTING THE UNSTRUCTURED CODE TO
STRUCTURED FORM.

FALSE C) IS THE PROCESS OF CONVERTING THE LOGICAL CONTROL STRUCTURE
OF A PROPER BUT UNSTRUCTURED PROGRAM TO A STRUCTURED
PROGRAM THROUGH A SERIES OF MANIPULATIONS AND TRANSFORMATIONS.

NOVEMBER 15, 1984

4. TESTING IS THE CONTROLLED EXERCISE OF PROGRAM CODE TO EXPOSE ERRORS.
CAUSES OF ERRORS ARE:

A) SYNTAX ERRORS; MISUSE OF THE LANGUAGE; ERRORS IN LOGIC
INSUFFICIENT ACCURACY; DATA STRUCTURE DEFECTS;
MISINTERPRETATION OF INITIAL SPECIFICATIONS.

B) INADEQUATE OR INCOMPLETE SPECIFICATIONS

C) INCORRECT ALGORITHM DESIGN

D) ACCIDENTS AND CLERICAL ERRORS.

5. THE BENEFITS OF AUTOMATED TESTING INCLUDE:

A) IMPROVED ORGANIZATION OF TESTING

B) MEASUREMENT OF TESTING COVERAGE

C) IMPROVED RELIABILITY

D) RELIEVED OF ROUTINE AND TIME CONSUMING CHORES.

NOVEMBER 22, 1984

6. THREE FORMS OF SECURITY PENETRATION ARE:

A) OBTAINING INFORMATION FROM THE COMPUTER

B) DEPRIVING OTHERS OF THE USE OF THE COMPUTER SYSTEM

C) MODIFYING THE INFORMATION IN THE SYSTEM FOR FRAUDULENT PURPOSES OR SABOTAGE.

7. GENERAL METHODOLOGIES OF PROTECTION AND SHARING IN OPERATING SYSTEMS EXIST. THREE EXAMPLES GIVEN WERE:

OPERATING SYSTEMS FOR IBM'S OS/360

MULTICS

HYDRA

MULTICS PROVIDES OBJECT SHARING AND SECURITY THROUGH:
(TRUE OR FALSE)

A) ACCESS CONTROL LISTS

FALSE B) A FOUR BIT LOCK PATTERN

FALSE C) CAPABILITIES IMPLEMENTATION THROUGH SOFTWARE

8. AUTHENTICATION OF USER OF SYSTEM OCCURS IN THREE BASIC METHODS:

A) BY LOCATION

B) BY CHARACTERISTICS

C) BY KNOWLEDGE

NOVEMBER 23, 1984

9. CRYPTOGRAPHIC TECHNIQUES (OR CIPHERS) FALL INTO TWO CLASSES:

A) SIMPLE

B) COMPOUND

10. CRYPTOGRAPHY IN COMPUTERS DIFFERS FROM TRADITIONAL CRYPTOGRAPHY IN THREE AREAS:

A) COMPLEXITY OF OPERATION

B) SIMPLIFICATION OF THE ALPHABET

C) ENHANCEMENT OF KEY USE

11. CRYPTOGRAPHY CAN BE APPLIED TO THREE MAJOR AREAS IN COMPUTER SYSTEMS:

A) AUTHENTICATION

B) PROTECTION IN COMMUNICATION

C) PROTECTION OF INFORMATION IN FILES.

NOVEMBER 26, 1984

12. MILESTONES ARE SCHEDULED BY MANAGEMENT TO MEASURE PROGRESS. HOWEVER, MANAGEMENT INSISTS ON USING REPORT FORMS. THE BENEFITS OF USING THESE FORMS ARE:
- A) THEY GIVE INFORMATION USEFUL IN DETERMINING WHEN THE FUTURE MILESTONES WILL BE ATTAINED
 - B) WEEKLY PERSONNEL AND COMPUTER REPORTS HELP TO MONITOR PROGRESS.
 - C) ADD ONLY A MINOR OVERHEAD TO THE PROJECT
 - D) INFORMATION CONTAINED WITHIN THE REPORT HELPS MANAGEMENT KEEP ABREAST.
13. WALKTHROUGH IS A REVIEW TO DISCOVER ERRORS IN THE SYSTEM. THE CHARACTERISTICS OF A WALKTHROUGH ARE: (TRUE OR FALSE)
- A) BRIEF (NOT MORE THAN 2 HOURS)
 - B) FOR ERROR DETECTION NOT ERROR CORRECTION
 - FALSE C) FOR THE BENEFIT OF ONLY MANAGEMENT
 - FALSE D) PRIMARILY A PERSONNEL EVALUATION TECHNIQUE
 - E) A MEETING WHEREBY THE PERSON REVIEWED DESCRIBES THE MODULE UNDER STUDY.
14. TECHNIQUES FOR SYSTEM DESIGN SUCH AS IBM'S CHIEF PROGRAMMER TEAM CONCEPT OR STRUCTURED ANALYSIS AND DESIGN TECHNIQUES SAFT:
- A) DO NOT GIVE ANY REAL INDICATION OF HOW TO PROCEED WITH A DESIGN
 - B) PROVIDE A GOOD STRUCTURE FOR DEVELOPING A SOFTWARE SYSTEM
 - C) STILL REQUIRE A CREATIVE MIND TO BEGIN THE BASIC DESIGN METHODOLOGY
 - D) FORCE PROGRAMMERS TO CONFORM TO THOSE TECHNIQUES WHICH ENHANCE CREATIVITY.

15. THERE ARE THREE PRINCIPAL FORMS OF BUSINESS ORGANIZATION:

- A) SOLE PROPRIETORSHIP
- B) PARTNERSHIP
- C) CORPORATION

16. THERE ARE FIVE MAJOR FACTORS TO CONSIDER (WITH LEGAL COUNSEL) BEFORE STARTING A BUSINESS.

- A) NATURE OF BUSINESS
- B) FLEXIBILITY OF BUSINESS OWNERSHIP
- C) SPECIAL CONSIDERATIONS OF BUSINESS MANAGEMENT
- D) INVESTMENT REQUIREMENTS OF THE BUSINESS
- E) TAX CONSIDERATIONS

17. PROTECTION OF DESIGN SOLUTIONS BY SOFTWARE ENGINEERS CAN BE ACCOMPLISHED USING 3 DISTINCT LEGAL REMEDIES:

- A) PATENTS
- B) COPYRIGHTS
- C) TRADE SECRETS.

18. NEGLIGENCE IS ANY CONDUCT THAT FALLS BELOW THE STANDARD ESTABLISHED BY LAW FOR THE PROTECTION OF OTHERS AGAINST RISK OF HARM. ELEMENTS THAT MUST BE PROVEN IN ORDER TO RECOVER INCLUDE:

- A) AN ACT THAT THE ACTOR AS A REASONABLE PERSON SHOULD REALIZE AS INVOLVING UNREASONABLE RISK OF CAUSING AN INVASION OF AN INTEREST OF ANOTHER.
- B) DUTY OF CARE
- C) BREACH OF THAT DUTY BY DEFENDENT
- D) THE BREACH OF DUTY WAS THE CAUSE IN FACT OF PLAINTIFF'S INJURY
- E) THE BREACH OF DUTY WAS THE PROXIMATE CAUSE OF THE INJURY
- F) THERE WERE DAMAGES AS A RESULT.

19. THE ELEMENTS ESSENTIAL TO CONTRACT FORMATION INCLUDE:

- A) LEGALITY OF OBJECT
- B) CAPACITY OF THE PARTIES
- C) MANIFESTATION OF MUTUAL ASSENT
- D) CONSIDERATION.

DECEMBER 7, 1994

20. BOTH MAINTENANCE AND DEBUGGING ARE PEOPLE INTENSIVE.
THUS, AS THE COST OF MANPOWER INCREASES: (TRUE OR FALSE)

A) THE COST OF MAINTENANCE AND DEBUGGING INCREASES

FALSE B) THE COST OF MAINTENANCE AND DEBUGGING DECREASES

21. THERE IS A RELATIONSHIP BETWEEN GOOD DESIGN PROCESS
AND LOW COST MAINTENANCE. THIS RELATIONSHIP IS:
(TRUE OR FALSE)

A) POSITIVELY CORRELATED

FALSE B) NEGATIVELY CORRELATED

22. LIST FIVE GOOD DESIGN PROCESS CHARACTERISTICS:

A) SMALL MODULE SIZE

B) MODULAR INDEPENDENCE

C) BLACK BOX CHARACTERISTICS

D) CONCEPTUAL MODELLING

E) ISOLATION OF DETAIL

DECEMBER 10, 1984

23. EFFICIENCY AS AN ULTIMATE DESIGN GOAL HAS BEEN OVERRATED SINCE THE 1950'S. THE RELATIONSHIP BETWEEN EFFICIENCY AND FLEXIBILITY IS: (TRUE OR FALSE)

- FALSE A) POSITIVELY CORRELATED
 B) NEGATIVELY CORRELATED

24. LIST FOUR STRUCTURED DESIGN CHARACTERISTICS:

- A) RESULTS IN INDEPENDENT BLACK BOX MODULES
B) HIERARCHY OF BLACK BOX MODULES
C) TOP DOWN ORGANIZATION
D) DETAILS IN THE LOWER LEVELS ARE ISOLATED

25. TOP DOWN DESIGNS ARE HIGHLY MAINTAINABLE AND EASILY TESTED. LIST THREE TOP-DOWN DESIGN CHARACTERISTICS:

- A) HIERARCHY OF MODULES
B) SINGLE ENTRY- SINGLE EXIT
C) DETAILS IN LOWER LEVEL MODULES.

26. PROCEDURAL CHARACTERISTICS OF A SYSTEM OR PROGRAM DEFINE THE ORDER OF PROCESSING. A TOOL FOR PROCEDURAL DESIGN IS THE: (TRUE OR FALSE)

A) FLOW CHART .

FALSE B) STRUCTURED CHART

FALSE C) DATA FLOW DIAGRAM

27. HIERARCHICAL CHARACTERISTICS OF A SYSTEM OR PROGRAM DEFINE THE RANK OF THE VARIOUS COMPONENTS OF THE DESIGN. A TOOL FOR THE HIERARCHICAL DESIGN IS THE: (TRUE OR FALSE)

A) STRUCTURED CHART

FALSE B) FLOW CHART

C) DATA FLOW DIAGRAM.

DECEMBER 13, 1984

28. SINCE THE DOCUMENTATION TECHNIQUE FOR STRUCTURED DESIGN IS THE STRUCTURED CHART, THE EVALUATION AND REFINEMENT TECHNIQUES FOR STRUCTURED DESIGN ARE THREE MEASUREMENTS:

- A) COUPLING
- B) COHESION
- C) PACKAGING

29. PACKAGING IS THE FINAL MEASUREMENT OF GOOD DESIGN STRUCTURE. LIST THREE PACKAGING CHARACTERISTICS:

- A) AN ACT OF SHAPING THE DESIGN TO FIT THE ENVIRONMENT
- B) MORE A QUESTION OF WHEN VERSUS HOW OR WHAT
- C) MODIFIES THE IDEAL DESIGN.

30. IDEAL DESIGN IS ENVIRONMENT INDEPENDENT DESIGN WHEREBY: (TRUE OR FALSE)

- A) COHESION IS MAXIMIZED
- FALSE B) COUPLING IS MAXIMIZED
- C) COUPLING IS MINIMIZED
- FALSE D) COHESION IS MINIMIZED

31. LIST EIGHT PACKAGING CONCERNS THAT SHOULD BE DELAYED FOR AS LONG AS POSSIBLE.

- A) CPU EFFIECIENCY
- B) CODING AND LANGUAGE CONCERNS
- C) OVERLAY STRUCTURE
- D) LINKAGE CONVENTIONS
- E) GROUPING OF MODULES INTO PROGRAMS
- F) PASSING PARAMETERS AS OPPOSED TO POINTERS
- G) HARDWARE DEPENDENCIES.

22. LIST THREE CHARACTERISTICS OF THE STRUCTURED CHART:
- A) HIERARCHICAL PARTITIONING OF MODULES
 - B) USE COHESION; COUPLING AS MEASUREMENTS TO HELP ANALYZE THE INTERDEPENDENCE OF MODULES
 - C) DECLARES HOW THE REQUIREMENTS WILL BE MET.
33. THE DATA FLOW DIAGRAMS DECLARE WHAT HAS TO BE ACCOMPLISHED THIS IMPLIES WE SHOULD ANSWER THE HOW BY: (TRUE OR FALSE)
- A) OBTAINING THE STRUCTURED CHART FROM THE DATA FLOW DIAGRAM
 - FALSE B) OBTAINING THE DATA FLOW DIAGRAM FROM THE STRUCTURED CHART.
34. LIST THE TWO TECHNIQUES AVAILABLE TO RELATE THE STRUCTURED CHART AND THE DATA FLOW DIAGRAM:
- A) TRANSFORM ANALYSIS
 - B) TRANSACTION ANALYSIS
35. THREE PRIMARY FUNCTIONS OF THE STRUCTURED CHART IS TO:
- A) PARTITION THE SYSTEM INTO MODULES
 - B) DETERMINE THE HIERARCHY OF THE MODULES
 - C) DETERMINE THE INTERFACES AMONGST THE MODULES.
36. DATA FLOW DIAGRAMS DECLARE: (TRUE OR FALSE)
- A) WHAT HAS TO BE ACCOMPLISHED
 - B) A STATEMENT OF REQUIREMENT
 - FALSE C) HOW THE REQUIREMENT SHALL BE MET
 - FALSE D) A STATEMENT OF DESIGN
 - E) THE METHOD OF DESIGN
 - FALSE F) THE INTENT OF DESIGN
37. COUPLING EVALUATION PROVIDES THREE ITEMS OF INFORMATION:
- A) MEASUREMENT OF QUALITY OF DESIGN
 - B) POINTS TO AREAS THAT NEED IMPROVEMENT
 - C) A MEASURE OF THE INTERDEPENDENCE OF THE MODULES.
38. LIST FOUR FACTORS AFFECTING THE PROBABILITIES/COUPLING:
- A) TYPE OF CONNECTION
 - B) TYPE OF DATA PASSED
 - C) AMOUNT OF DATA PASSED
 - D) DIRECTION OF SOME COUPLES

DECEMBER 17, 1984

39. AFTER TRANSACTION ANALYSIS AND TRANSFORM ANALYSIS HAVE GIVEN THE STRUCTURE CHART ITS INITIAL SHAPE, ALTERATIONS TO THE STRUCTURE CHART ARE MADE TO IMPROVE FLEXIBILITY. LIST FOUR DATA FLOW DIAGRAM PROCESS FACTORS THAT SHOULD NOW BE CONSIDERED:

- A) FLOW OF CONTROL INFORMATION
- B) 'TRIVIAL' ERROR PATHS
- C) LOOPS AND DECISIONS
- D) PACKAGING CONSIDERATIONS

40. TRANSACTION ANALYSIS IS EMPIRICALLY DERIVED. LIST THREE LEVELS OF FORMALIZED STRUCTURE:

- A) TRANSACTION
- B) ACTION
- C) DETAIL

41. ONE PHILOSOPHY OF DESIGN IS TO MODEL THE STRUCTURE OF DATA VERSUS THE DATA FLOW ITSELF. THE USE OF THE DATA DICTIONARY AS PRINCIPAL INPUT TO ANY DESIGN PROCESS IMPLIES THREE CATEGORIES:

- A) ITERATIONS OF DATA DEFINITIONS
- B) SELECTIONS
- C) DATA SEQUENCES.

42. LIST TWO CHARACTERISTICS OF PHASED IMPLEMENTATION OR BY ANOTHER NAME TOP DOWN IMPLEMENTATION:

- A) CODING AND UNIT TESTING THE TOP MODULES FIRST
- B) USE OF STUBS TO EMULATE LOWER LEVEL FUNCTIONS.

43. LIST SIX ADVANTAGES OF TOP DOWN IMPLEMENTATION:

- A) CRITICAL INTERFACES ARE TESTED FIRST
- B) EARLY VERSIONS HOWEVER INCOMPLETE, RESEMBLE THE REAL SYSTEM ENOUGH
- C) NO NEED FOR COSTLY AND COMPLICATED TEST DRIVERS
- D) USEFUL OVERLAP OF CODING, UNIT TESTING AND INTEGRATION TESTING
- E) MACHINE TIME REQUIREMENTS ARE SMOOTHED OUT
- F) MORALE IMPROVEMENTS IN PERSONNEL.

LIST THE FIVE DESIGN TECHNIQUES DISCUSSED IN CLASS LECTURES:

- A) STEPWISE REFINEMENT
- B) LEVELS OF ABSTRACTION
- C) INTEGRATED TOP DOWN DEVELOPMENT
- D) STRUCTURED DESIGN
- E) JACKSON STRUCTURED PROGRAMMING

45. JACKSON STRUCTURED PROGRAMMING IS A TECHNIQUE FOR MAPPING THE STRUCTURE OF A PROBLEM INTO A PROBLEM STRUCTURE. LIST THE THREE MAPPING MODELS:

- A) INPUT- OUTPUT MODEL
- B) STRUCTURED MODEL
- C) DETAILED DESIGN MODEL

46. WALKTHROUGH IS AN IN DEPTH TECHNICAL REVIEW. LIST SIX CHARACTERISTICS OF THE WALKTHROUGHS:

- A) CAN BE USED AT ANY TIME
- B) HAS SIX PEOPLE
- C) REVIEW MATERIAL DISSEMINATED IN ADVANCE
- D) MATERIAL IS REVIEWED NOT THE PRESENTER
- E) HIGH LEVEL MANAGEMENT IS NOT IN ATTENDANCE
- F) FOCUS IS ON DETECTION OF ERROR NOT CORRECTION OF ERROR

47. LIST FOUR CHARACTERISTICS OF DESIGN INSPECTIONS:

- A) CONDUCTED BY A TEAM OF TRAINED INSPECTORS
- B) WORK FROM CHECKLISTS
- C) TYPICALLY WORK IN TWO 2 HOUR SHIFTS
- D) REMOVE 67-70% OF ERRORS BEFORE UNIT TESTING.

48. LIST TWO BENEFITS OF SYSTEMATIC DESIGN METHODS:

- A) ENHANCE YOUR THOUGHT PROCESS
- B) IMPROVE YOUR ABILITY TO THINK, COMMUNICATE, AND VERIFY DESIGN.

SOFTWARE ENGINEERING IMPLIES THE BETTER USE OF EXISTING TOOLS AND TECHNIQUES THAT WILL IMPROVE THE PROCESS OF SOFTWARE DESIGN. HOWEVER, THESE TOOLS ARE NO SUBSTITUTE FOR HUMAN ATTRIBUTES. LIST THREE DESIRABLE HUMAN ATTRIBUTES:

- A) CREATIVITY
- B) INTELLIGENCE

C) HARD WORK

50. LIST THE FOUR WAYS TO IMPROVE SOURCE CODE CLARITY:

- A) STRUCTURED CODING TECHNIQUES
- B) CODING STYLE
- C) PROGRAM UNIT NOTEBOOKS
- D) INTERNAL DOCUMENTATION.

51. LINEAR FLOW ENHANCES PROGRAM READABILITY. LIST THE FOUR DESIGN PHASES THE BENEFIT FROM INCREASED READABILITY:

- A) DEBUGGING
- B) TESTING
- C) DOCUMENTATION
- D) MODIFICATION

JANUARY 7, 1985

52. LIST THE BENEFITS OF MODERN PROGRAMMING LANGUAGES SUCH AS PASCAL OR ADA:

A) INCREASED NOTATIONAL CONVENIENCE

B) INCREASED READIBILITY

C) INCREASED EFFICIENCY (SOMETIMES)

D) SAME CONSTRUCTS AS MORE PRIMITIVE LANGUAGES

53. LIST THE DISADVANTAGES OF SINGLE ENTRY, SINGLE EXIT CONSTRUCTS WERE THEY ARE IN APPROPRIATE:

A) REQUIRE AUXILIARY VARIABLES

B) REPEATED SEGMENTS OF CODE

C) REQUIRE EXCESSIVE SUBPROGRAM CALLS

54. DATA ENCAPSULATION IMPLIES: (MULTIPLE CHOICE; ONE ANSWER)

A) PACKING OF A DATA STRUCTURE AND ITS ACCESS ROUTINES INTO A SINGLE MODULE

B) PACKING OF A DATA STRUCTURE AND ITS ACCESS ROUTINES INTO SEPERATE MODULES

C) ONLY SINGLE ENTRY, SINGLE EXIT CONSTRUCTS ALLOWED.

JANUARY 20, 1995

Q. LIST TWO EFFECTS THE USE OF GO TO STATEMENTS HAVE ON AN ALGORITHM:

A. BREAKS THE NATURAL STRUCTURE OF AN ALGORITHM

B. DESTROY THE CORRESPONDENCE BETWEEN STATIC AND DYNAMIC PROGRAMMING STRUCTURES

56. LIST THE EIGHT DO'S OF GOOD CODING STYLE.

LANGUAGE PER STANDARD CONTROL CONSTRUCTS

56. USE GO TO'S IN A DISCIPLINED MANNER

C) INTRODUCE USER-DEFINED DATA TYPES
FOR MODEL ENTITIES IN THE PROBLEM DOMAIN

D) HIDE DATA STRUCTURES BEHIND ACCESS FUNCTION

E) ISOLATE MACHINE DEPENDENCIES IN A FEW ROUTINES

57. USE A FEW STANDARD DOCUMENTATION PROLOGUES FOR
EACH SUBPROGRAM

G) CAREFULLY EXAMINE ROUTINES WITH <5 AND >25 STATEMENTS

H) USE INDENTATION AND PROPER FORMATTING

57. LIST THE EIGHT DON'T'S OF GOOD CODING STYLE

A) DON'T BE TOO CLEVER

B) AVOID NULL THEN STATEMENTS

C) AVOID THEN IF STATEMENTS

D) DON'T NEST TOO DEEPLY

E) AVOID OBSCURE SIDE EFFECTS

F) DON'T SUBOPTIMIZE

G) CAREFULLY EXAMINE ROUTINES HAVING PLUS FIVE FORMAL PARAMETERS

H) DON'T USE AN IDENTIFIER FOR MULTIPLE PURPOSES.

58. LIST THREE EXAMPLES OF RECURSIVE PROGRAMMING

A) LINKED LISTS

B) TREES

C) RECURSIVE DATA STRUCTURES

59. LIST TWO EXAMPLES OF RECURSIVE SPECIFICATION BUT
ITERATIVE ALGORITHM FOR IMPLEMENTATION:

A) FACTORIAL NUMBERS

B) FIBONACCI SERIES

ASSERTAIN WHICH STATEMENT IS CORRECT: (TRUE OR FALSE)

FALSE A) RECURSIVE SPECIFICATION AND RECURSIVE IMPLEMENTATION
HAVE THE SAME MEANING

B) RECURSIVE SPECIFICATION AND RECURSIVE IMPLEMENTATION
HAVE DIFFERENT MEANING

61. LIST TWO EXAMPLES OF MODERN PROGRAMMING LANGUAGES

A) PASCAL

B) ADA

62. LIST TWO EXAMPLES OF PRIMITIVE PROGRAMMING LANGUAGES

A) FORTRAN

B) BASIC

63. COMPLETE THE SENTENCE:

' STATIC IS TO DYNAMIC AS'.....

A) TEXTURAL IS TO COMPUTATIONAL

64. RECURSIVE PROGRAMMING WHEN APPROPRIATE, RESULT
IN THREE BENEFITS:

A) IS ONE THAT CALLS ITSELF

B) IS A POWERFUL TECHNIQUE FOR PROGRAMMING

C) RESULTS IN CLARITY AND EFFICIENCY FOR PROGRAM

65. FUNCTIONAL SPECIFICATIONS: (TRUE OR FALSE)

A) STATE WHAT AND NOT HOW TO ACHIEVE IT

FALSE B) STATE HOW TO ACHIEVE IT NOT WHAT

66. GO TO STATEMENTS SHOULD BE: (MULTIPLE CHOICE)

A) NEVER USED

B) USED IN A DISCIPLINED MANNER

C) USED IN COMMON STRUCTURES

67. LIST THREE BASIC CONTROL FLOWS EXHIBITED BY THE SINGLE ENTRY, SINGLE EXIT CONSTRUCTS:

A) SEQUENCING

B) SELECTION

C) ITERATION

68. LIST THE FOUR NON-BASIC CONTROL FLOWS ALLOWED BY THE SINGLE ENTRY, SINGLE EXIT CONSTRUCTS:

A) IF THEN ELSE

B) WHILE DO

C) REPEAT UNTIL

D) CASE STATEMENT

69. LIST THE TWO UNDESIRABLE AFFECTS OF IMPROPER USE OF SINGLE ENTRY, SINGLE EXIT CONSTRUCTS:

A) INEFFICIENT USE OF MEMORY

B) EXCESSIVE EXECUTION TIME

70. WHEN SINGLE ENTRY, SINGLE EXIT CONSTRUCTS RESULT IN POOR READABILITY, YOU SHOULD: (TRUE OR FALSE)

FALSE A) CONTINUE TO USE THE SINGLE ENTRY, SINGLE EXIT CONSTRUCT

B) USE SOME OTHER CONSTRUCT THAT RESULTS IN INCREASED CLARITY

71. GOOD CODING STYLE RESULTS IN CODING THAT IS: (TRUE OR FALSE)

A) EASILY UNDERSTOOD

B) STRAIGHTFORWARD

C) ELEGANT

FALSE D) CLEVER

FALSE E) SUBOPTIMIZED

22. MODERN PROGRAMMING LANGUAGES SUCH AS ADA HAVE: (TRUE OR FALSE)
A) MANY STRUCTURED CONSTRUCTS

B) MANY EXCEPTION HANDLING MECHANISMS

FALSE C) THE SAME CONSTRUCTS ALLOWED AS IN PRIMITIVE LANGUAGES

D) USE GO TO'S AND IF STATEMENTS LIKE THE PRIMITIVE LANGUAGES DO

FALSE E) CANNOT USE GO TO'S AND IF STATEMENTS

F) NON-FIXED STATEMENTS FOR LOOP TERMINATION.

23. ONLY MODERN LANGUAGES AND NOT THE PRIMITIVE LANGUAGES (SUCH AS FORTRAN) ALLOW USER-DEFINED DATA TYPES.
LIST FOUR BENEFITS USER-DEFINED DATE TYPES WHEN PROPERLY USED:

A) SEGMENT THE PROBLEM DOMAIN IN A LOGICAL MANNER

B) INVOLVE INCREASED DATA SECURITY

C) IMPROVE CLARITY AND READIBILITY

D) PLACE CONSTRAINTS ON OBJECTS OF A GIVEN TYPE

24. THE MORE DESCRIPTIVE THE LANGUAGE, THE LESS NEED FOR DOCUMENTATION PROLOGUE.
THUS THE LANGUAGE REQUIRING THE MOST DOCUMENTATION PROLOGUE WOULD BE: (MULTIPLE CHOICE)

A) ASSEMBLY

B) FORTRAN

C) ADA

D) PASCAL

LIST THE FIFTEEN ELEMENTS OF A DOCUMENTATION PROLOGUE:

- A) NAME OF AUTHOR
- B) DATE OF COMPLETION
- C) FUNCTION PERFORMED
- D) ALGORITHMS USED
- E) PARAMETERS AND MODES
- F) INPUT ASSERTION
- G) OUTPUT ASSERTION
- H) GLOBAL VARIABLES
- I) SIDE EFFECTS
- J) MAJOR DATA STRUCTURES
- K) CALLING ROUTINES
- L) CALLED ROUTINES
- M) TIMING CONSTRAINTS

N) EXCEPTION HANDLING

O) ASSUMPTIONS

76. THE PROPER SUBPROGRAM SHOULD BE ABLE TO BE DESCRIBED IN ONE SIMPLE SENTENCE. HOWEVER, LIST THE FIVE COMPONENTS OF THE SUBPROGRAM:

- A) SPECIFICATION
- B) DOCUMENTATION PROLOGUE
- C) DECLARATIONS
- D) EXECUTABLE STATEMENTS
- E) EXCEPTION HANDLERS (OPTIONAL)

77. LIST THE THREE TYPES OF ORGANIZATIONAL STRUCTURE FOR DESIGN PROCESS:

- A) DEMOCRATIC TEAM
- B) CHIEF PROGRAMMER TEAM
- C) HIERARCHICAL TEAM

78. LIST THREE CATEGORIES OF DESIGN PROCESS THAT SHOULD BE RECORDED. (IE, DOCUMENTING TIME SPENT ON PROJECT ACTIVITIES)

- A) ALL MEETINGS
- B) WRITING CODE
- C) DEBUGGING AND TESTING

79. LIST THREE BENEFITS OF PROJECT LEGACY

- A) SHOW STUDENTS WHAT SHOULD HAVE BEEN DONE VERSUS WHAT ACTUALLY WAS DONE
- B) WHERE THE DESIGN WENT WRONG (IF AT ALL)
- C) PROVIDES EXCELLENT PERSPECTIVE

80. LIST THE FOUR ITEMS OF THE "LITMUS TEST FOR PROJECT DESIRABILITY"

- A) TOO AMBITIOUS...../ NOT AMBITIOUS ENOUGH
- B) GOALS OF PROJECT CLEARLY UNDERSTOOD
- C) PROJECT CAN BE EXPANDED.... / REDUCED LATER
- D) CAN PROJECT BE SUBDIVIDED INTO SUBTASKS (FOR EACH TEAM; FOR EACH TEAM MEMBER)

81. LIST THE THREE VERSIONS OF A PROJECT DISCUSSED IN PROJECT PLANNING:

- A) PROTOTYPE VERSION
- B) WORKING VERSION (MODEST)
- C) ENHANCED VERSION

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82. LIST THE SEVEN STEPS FOR PROPER DESIGN METHODOLOGY AND PROJECT PLANNING:

A) SYSTEM DEFINITION

B) SOFTWARE REQUIREMENTS SPECIFICATION

C) DESIGN DOCUMENT

D) TEST PLAN

E) USER'S MANUAL

F) PROPERLY DOCUMENTED, DEBUGGED, TESTED PROGRAMS

G) PROJECT LEGACY DOCUMENT

83. LIST THE EIGHT COMPONENTS OF A PROJECT LEGACY REPORT:

A) PROJECT DESCRIPTION

B) INITIAL EXPECTATIONS

C) CURRENT STATUS OF THE PROJECT

D) REMAINING AREAS OF CONCERN

E) ACTIVITIES/ TIME LOGS

F) TECHNICAL LESSONS LEARNED

G) MANAGERIAL LESSONS LEARNED

H) RECOMMENDATIONS TO FUTURE PROJECTS