

MOLECULAR 18 PROGRAMMING
COURSE TIMETABLE

MONDAY - DAY ONE

10.00 am	INTRODUCTION	Programming Manual Molecular 18 Concepts - Operating System - Programs/Tasks/Partitions - Spooling - Machine Code/Mnemonics/Registers
11.30 am	COFFEE	
11.45 am	MEMORY STRUCTURE	Bits/Bytes/Words Binary/Octal Notation Decimal/Octal Conversion Examples Word Formats - Constants/Parameters/Literals/ Instructions/Addresses Pages/Columns/Steps Addressing and Offsets Example
1.30 pm	LUNCH	
2.30 pm	LITERALS	ASCII Metacode ASCII Conversion Chart
3.30 pm	COFFEE	
3.45 pm	INSTRUCTION SET	Memory Reference Instruction - Instruction Format - Instruction Set - Available Constant Factors - Example
5.45 pm	CLOSE	

TUESDAY - DAY TWO

9.00 am	INSTRUCTION SET	Micro or Register Instructions Instruction Format - A Reg and B Reg Relationship - Mode 01 Instructions - Mode 10 Instructions
11.00 am	COFFEE	
11.15 am	INSTRUCTION SET	Micro or Register Instructions - Examples 1 and 2 - Mode 11 Instructions - Example 3
1.30 pm	LUNCH	
2.30 pm	INSTRUCTION SET	Micro or Register Instructions - Instruction Combinations - Multiple Instructions
3.15 pm	COFFEE	
3.30 pm	SUBROUTINES	Data Handling
5.30 pm	CLOSE	

WEDNESDAY - DAY THREE

9.00 am	QUESTIONS	
9.30 am	SUBROUTINES	Examples 1, 1a and 2
11.00 am	COFFEE	
11.15 am	SUBROUTINES	Task Partition Structure Program Access/Directories/Index Input/Output Handling General Program Design
1.30 pm	LUNCH	
2.30 pm	EXAMPLE	Reverse and Display Input - Introduction - Coding
4.30 pm	UTILITIES	Program Development - PLM/OP/LIST Programmer Aids - SE/FE/SRCH/Q/S/BOOT/KICK/R/SUM Security - DLU/DS70/SS70
5.30 pm	CLOSE	

THURSDAY - DAY FOUR

9.00 am QUESTIONS

9.30 am EXAMPLE Reverse and Display Input
Program Debugging

11.00 am COFFEE

11.15 am EXAMPLE Reverse and Display Input
Program Debugging

1.00 pm LUNCH

2.00 pm MOLECULAR Switch On/Off
Load/Unload Disk
Bootstrapping
- Normal
- Recovery
- Re-label Discs

3.00 pm COFFEE

3.15 pm SPOOLING Print Queues/Print Queue Table
Task Spool Buffer/Spool Table
Spooling Example
Spooling System Subroutines

5.30 pm CLOSE

FRIDAY - DAY FIVE

9.00 am QUESTIONS

9.30 am EXAMPLE

Check Digit Print

- Introduction
- Coding

11.00 am COFFEE

11.15 am EXAMPLE

Check Digit Print

- Coding

1.00 pm LUNCH

2.00 pm COMMANDS

3.00 pm EXAMPLE

Check Digit Print

- Coding
- Program Debugging

4.00 pm CLOSE

MONDAY - DAY SIX

9.00 am QUESTIONS

9.30 am EXAMPLE Check Digit Print
- Program Debugging

11.00 am COFFEE

11.15 am EXAMPLE Check Digit Print
- Program Debugging

1.00 pm LUNCH

2.00 pm EXAMPLE Check Digit Print
- Program Debugging

3.00 pm COFFEE

3.15 pm DISC FILES Record Organisation
Reserved Areas on Disc
- Catalogue Print
- Program Map Print
File Control Blocks
File Table/System Catalogue
File Status Blocks
Master Buffer/Shared Buffer
Control Record

5.30 pm CLOSE

TUESDAY - DAY SEVEN

9.00 am QUESTIONS

9.30 am MOLECULAR

Demonstration

- CATM Utility
- ACT Utility
- CATP Utility
- PMAP Utility
- CMAP Utility

10.30 am CONFIGURATION SET
UP

Configuration Map

11.00 am COFFEE

11.15 am DISC FILES

File Types Available

Hybrid File Control Blocks

- Limitations of File Table
- Example Usage

1.00 pm LUNCH

2.00 pm DISC FILES

Hybrid File Control Block

- Indexed Sequential Files

3.00 pm COFFEE

3.15 pm DISC FILES

Multi-System Environment

- File Tables
- 'T' Command
- LOAD Utility

3.45 pm SUBROUTINES

Disc File Handling

5.30 pm CLOSE

WEDNESDAY - DAY EIGHT

9.00 am QUESTIONS

9.30 am EXAMPLE

Statements

- Name and Address Processor
- Introduction
- Coding

1.00 pm LUNCH

2.00 pm EXAMPLE

Statements

- Coding

5.30 pm CLOSE

THURSDAY - DAY NINE

9.00 am QUESTIONS

9.30 am EXAMPLE Statements
- Coding

1.00 pm LUNCH

2.00 pm EXAMPLE Statements
- Coding

5.30 pm CLOSE

FRIDAY - DAY TEN

9.00 am QUESTIONS

9.30 am FORM CONTROL Print Queues
Test Prints
'L' Command
SET Q Utility
DEL Q Utility

11.00 am COFFEE

11.15 am EXAMPLE Statements
- Program Debugging

1.00 pm LUNCH

2.00 pm EXAMPLE Statements
- Program Debugging

4.00 pm CLOSE

MONDAY - DAY ELEVEN

9.00 am QUESTIONS

9.30 am SYSTEM MODULE 11 File Enquiry Set Up
 Program Class Inhibit System
 Line Up Command Set Up
 Reorganisation of Files

11.00 am COFFEE

11.15 am SYSTEM MODULE 11 Security Copying
 - Phase I and Phase II Copying
 - Control Parameters
 - Example on D8000
 - Recovery Copying
 - Skipping Securities

1.00 pm LUNCH

2.00 pm EXAMPLE Statements
 - Debug Facilities
 - Program Debugging

3.00 pm COFFEE

3.15 pm EXAMPLE Statements
 - Debug Facilities
 - Program Debugging

5.30 pm CLOSE

TUESDAY - DAY TWELVE

9.00 am	QUESTIONS	
9.30 am	DISC FILES	File Updating on Chained Files - Methodology - Example
11.00 am	COFFEE	
11.15 am	EXAMPLE	Statements - Program Debugging
1.00 pm	LUNCH	
2.00 pm	EXAMPLE	Statements - Program Debugging
3.00 pm	COFFEE	
3.15 pm	UTILITIES	
5.30 pm	CLOSE	

WEDNESDAY - DAY THIRTEEN

9.00 am	PROGRAM DEVELOPMENT	Program Design - Initialising Work Areas - Location of Literals/Work Areas/ Parameters/Buffers - Neatness/Documentation - Problems running over 32K Useful Programmer Information
10.00 am	INSTALLATION	
1.00 pm	LUNCH	
2.00 pm	MULTI LIBRARY	Concept Benefits Multi-Library Set Up
4.00 pm	CLOSE	

EXAMPLES FOR MOLECULAR 18 COURSE

DAY 1

1. Write a routine on Column 00 Step 20 onwards to test 2 numbers each of which is held in a single word location. If the numbers are equal then no further action is necessary. If the numbers are not equal then do the following
 - a. multiply the first by 3 and store it in a single word location
 - b. multiply the second by itself and store the result in another single word location.

You may assume the two original numbers are in the range (1-200).

EXAMPLES FOR MOLECULAR 18 COURSE
DAY 2

1. Write a routine on 05/0020 onwards to subtract a double word number stored in 05/0074 and 05/0075, from a double word number stored in 05/0076 and 05/0077 and leave the result in double word location 05/0072 and 05/0073.
2. Write a routine on 05/0020 onwards to load a number (1-5000) in Accumulator A from location 05/0077, multiply it by 11 and leave the result in location 05/0076. If the number is outside the specified limits, go to an Error Handler ie. JUMP IZP 1641.
3. Write a routine on 05/0000 onwards to search a string of 20 characters and replace any Nul characters with 'space' characters.

EXAMPLES FOR MOLECULAR 18 COURSE

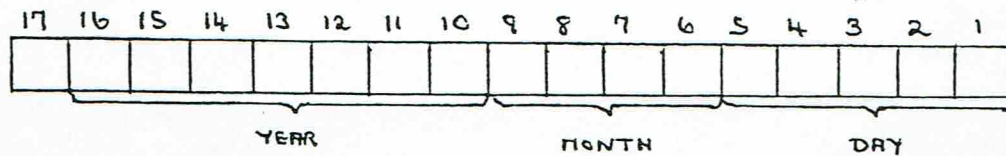
DAYS 3 - 4

1. Write a routine on 05/0200 onwards which will calculate the following statistic

$$\% \text{ COST} = \frac{\text{SELLING PRICE} - \text{COST PRICE}}{\text{COST PRICE}} \times 100$$

where the Selling and Cost prices are both held in known double word locations. Set the % Cost in a 1-word location and then convert % Cost to ASCII.

2. Assume a date has been entered into memory location 05/0070 onwards in the ASCII format dd mm yy. Write a routine on 05/0000 onwards to pack the date into a 1 word location at 05/0077 in the following format



3. Write a routine which will allow entry of up to 20 characters reverse their order and redisplay them on the VDU Screen alongside the original entry.

The routine should display its own name on entry and be password protected. Any number of entries are to be allowed, each being initiated by the prompt CHARS : . The routine is to be terminated by use of the ESCAPE key.

EXAMPLES FOR MOLECULAR 18 COURSE

DAY 5 - 6

1. Write a routine which will allow the operator to enter a range of numbers (1-999999) which will be printed out along with their corresponding check digits calculated by applying weights 1, 3, 7, 1, 3, 7 and using a modulus of 10.

The details will be printed out as per the attached Print Layout and should include a date which can be found in packed form at location 00/0477.

<u>Step</u>	<u>I/O Station Display</u>	<u>Operator Action</u>
1	CHECK DIGIT LIST	
2	ORIGINATED BY	Enter up to 12 characters and ACCEPT. Enter ESC to return to PROGRAM?
3	START NO	Enter start number in range 1-999999 and ACCEPT. Enter ESC to return to Step 2.
4	END NO	Enter end number in range (start number - 999999) and ACCEPT. Enter ACCEPT only if end number is the same as the start number. Enter ESC to return to Step 3.

VDU Screen Layout

BCL

MFG. ORDER No.		CUST:		JOB:	ROUTINE:	MODULE:
		M18 PROGRAMMING COURSE				
		BRANCH	AUTHOR	DATE:	SHEET:	

COMMENT

PROGRAM? XXXX
CHECK DIGIT LIST
ORIGINATED BY : XXXXXXXXXX
START NO. : 000000
END NO. : 000000

