

# networknews

UNIVERSITY OF MINNESOTA COMPUTER CENTER • 227 EXPERIMENTAL ENGINEERING • MINNEAPOLIS, MINNESOTA 55455 • (612) 373-7744

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Proposals for improving the parking facilities at Lauderdale and the access to the building are being considered by the University Planning Office and the Lauderdale building advisory committee.

Your comments and suggestions may be sent to any of the committee members. UCC's representative is Richard Folden, 150A Lauderdale, 373-4876.

## UCC NEWSLETTER

Volume 10, Number 9  
September, 1976

EDITOR: A. Koepke  
235a ExpEng  
612/373-7744

373-4548 Account Clerk  
373-4360 Administrative Offices  
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373-7744 Reference Room  
376-3963 RJE Services (R. Franta)  
373-5754 RJE Services (G. Jensen)  
373-9751 Secretary, Graphics Lab  
373-4912 Secretary, Lauderdale  
373-4995 Tape Librarian  
376-5592 Telephone consulting: MIRJE  
373-5753 Telephone consulting: MERITSS  
373-4599 User Services (T. Hodge)  
373-4921 User's Room, Lauderdale  
373-3608 West Bank Computer Center

YOU REALLY DID GET YOUR AUGUST UCC NEWSLETTER  
BUT IT HAD A DIFFERENT NAME.  
WE WOULD LIKE YOUR OPINIONS ON THE PROPOSED  
NAME CHANGE. PLEASE SEE PAGE 5.

376-5592 THE HELP-LINE

## KRONOS UPDATE

--by L. Liddiard

Both the Cyber 74 and the 6400 are now running modified operating systems (see the following articles in this newsletter). During the summer, new upgrades of the operating systems were made to provide an integrated software system for both machines. The Cyber 74 software was chosen as the basic system since it was the latest version (Level 12) whereas the 6400 had been running Level 7, already two years old.

6400 users (MERITSS) were offered free test periods in August to try out their running programs on the new system. Extensive information on the MERITSS changes was published in both SYSNOTEs and in this newsletter.

Since the changes to the Cyber 74 system were extensions and bug corrections only, users do not have to test or benchmark their production programs. However, the UCC systems group will have two free test periods of the final version of the operating system for fall quarter. (These test periods were planned for August but postponed until September to accommodate vacationing users.) The free test periods will be:

Sunday 12 Sept 1976 2:00-4:00 PM  
Saturday 18 Sept 1976 4:00-6:00 PM

Systems group staff will man the HELP-line (376-5592) and be available at Lauderdale to help any user with problems. We suggest that users who have doubts about programs for fall quarter or who have not tried programs since last year use these periods to check out the system. During these test periods, the user's normal permanent files will be available. The two main system packages to be tested will be auto divert and our new high speed EXPORT.

As in past free test periods, users who put in large time limit jobs may end up fighting for the CP. We will drop incomplete jobs at the end of the period; this is a test period and not free production time.

## CYBER / MIRJE

--by B. Hanson

Over the summer, gradual changes have been made to the Cyber 74 operating system to accommodate the field length restrictions of

MERITSS and to add desirable features for the benefit of MIRJE users. The following list of changes affects Cyber 74 users:

(1) CATLIST  
The BR parameter was added to suppress the title and headers (for example, CATLIST,BR.).

The short list, CATLIST., is alphabetized.

(2) Permanent Files  
The SS parameter has been added to the permanent file commands. This parameter allows the user to set or change the subsystem associated with the file; this affects the SAVE and CHANGE commands.

Increased file protection is now offered in the permanent file routines SAVE, DEFINE, and CHANGE. When the protection is ON, everyone, even the owner, must specify the password to manipulate the file. FP=ON activates the protection (the file must have a password) and FP=OFF,PW=password on the CHANGE card will remove the protection. If a file is protected, a CATLIST will display seven stars (\*\*\*\*\*) where the password would normally appear. If the user is a master user, a CATLIST of a subordinate user's catalog will display the passwords of all files. Use of the FP parameter is a validated option and will be given to classroom numbers only.

(3) KCL  
The PRINT control card has been added. PRINT sends an expression and an optional message to the output file. The parameters are the same as DISPLAY.

The function, LIT, can be used in KCL expressions to return a number corresponding to the display code value of a three character name. For example, LIT(ABC) returns 10203B as a value.

(4) DAYFILE  
Three additional parameters have been added to the DAYFILE control card to permit the user to specify the initial and final times for the dump.

TI=hmmss sets the initial time;  
TF=hmmss sets the final time;  
T=hmmss sets the initial time when no final time is specified.

(5) TDUMP  
If the TT parameter is specified on the TDUMP control card, the listing will be in TTY style, regardless of the job origin.

(6) MODIFY  
The characters, \*0, are treated as an abbreviation for the command \*OPLFILE.

(7) CPL  
The common decks, COMCARG and COMCUPC, now have conditional assembly to specify the maximum number of characters per parameter.

(8) Validations  
Two more bits in the access word have been allocated. CACC validates the use of the multiple ACCOUNT and USER cards (all Cyber 74 users have this permission) and CPPF validates the use of file protection.

(9) NOTICE  
Upon login in or upon the initial use of the USER or ACCOUNT card from Batch, the program, NOTICE, will be run. NOTICE will print messages from the account's master user and from the system. NOTICE may also be run by issuing the command, NOTICE.

(10) TELEX  
Several changes that affect MIRJE users have been made to TELEX:

(a) the GAME command has been added to obtain programs from the game catalog;

GAME,name

is equivalent to the control statement

A,name/UN=GAME.

(b) There is now a terminal type, BARROW, that treats the back arrow as a normal character rather than a backspace.

(c) The concept of a master user has been implemented. A master user is a user with stars (\*) in his user number; the master user has the ability to monitor and log off subordinate users.

(d) The APL subsystem now calls APLUM rather than APL\*CYBER; for information, see WRITEUP,APLUM.

(e) The MNF subsystem now calls the TSF compiler (a shorter and faster version of

the MNF compiler). The default field length is now only 41000 so some programs than ran before may need to use the MA option on the RUN command (i.e., RNH,MA=45000) to ask for the field length necessary to compile.

(f) The default field length for the BASIC compiler has been lowered; in some cases it may be necessary to use the MA parameter on the RUN command to run programs.

## 6400 / MERITSS

--by R. Williams

On August 22 the MERITSS system began running the consolidated operating system based on CDC's KRONOS 2.1.2, full time. The four test periods that were held helped find errors in the system. Most of these errors have been corrected; a few minor ones remain. The following errors were reported and are being corrected, require preference information from users, or call for adjustment in user programs and procedures not foreseen earlier.

- (1) Several MNF library programs have unsatisfied external references. We are working on correcting these and will put them up gradually. The problem results from the change in library and calling sequence for the MNF compiler. Use PAST,TSF to run these programs. If this does not work or if there is a particular program that does not get corrected soon, please call us.
- (2) The listing from MNF and TSF when the K option is used has a heading "Y OF MINNESOTA"; this will be fixed in the future.
- (3) TSF lists the error messages and the line in error in place of just the message. This was installed as a feature but may be removed if user response so indicates. Please tell us how you feel about this.
- (4) PASCAL programs that link to FORTRAN subroutines may get UNSATISFIED EXTERNALS on loading. To correct this, issue the command  

```
X,LIBRARY,FT3LIB
```

to indicate the library to be used for FORTRAN externals (see point 15, below).

- (5) Some CALLPRG (automatically called) procedure files are not yet available. We tried to convert all UCC-maintained procedures but those that belong to individuals and departments have not yet been converted. We are going to continue to maintain these procedures as DO type, contrary to previous announcements. Thus,

```
X,DO,MULTREG
```

for example, will continue to work as in the past. The primary reason for this is to distinguish between UCC and non-UCC supported procedures.

- (6) A few WRITEUP files are not yet available. If you know of a WRITEUP that is on the Cyber 74 and is applicable to MERITSS or have an idea for a good WRITEUP, please let us know.
- (7) The warning message (such as is used before the end of operations) will now interrupt output. This was done since the warning is considered serious enough to warrant this treatment.
- (8) Several of the MAP options (notably S) have disappeared. This was a result of the change in base systems. We would like your comments on the load map options for timesharing users.
- (9) TSF always rewinds the binary file before compiling the program, making multiple compilations difficult. This is a partial error. The binary file is to be rewound when the K (line number) option is used and no binary file is specified (using the B parameter) but not in any other cases. We hope to fix this soon.
- (10) The SETPR control card will only allow a downward setting of priority. This is a result of the design of SETPR and we have no plans to change it at this time.
- (11) To use TEKLIB, a  

```
FETCH,TEKLIB
```

followed by a compile of your program and then a  

```
LINK,X,P=TEKLIB
```

is required. (Note that all this is in the BATCH subsystem.)
- (12) If a user hits a PRU limit and then tries to call a procedure file, the message, FILE NOT FOUND, is issued instead of something more meaningful. This is being investigated.

- (13) MNF and TSF create files that are rewound in a program, even if no data has been placed on them. This is because binary blocking is now ON by default. To avoid this problem (FORTRAN is putting binary block control words in the file) you may want to specify unblocked files by using the statement

```
CALL FTNBIN(0,0)
```

in your programs.

- (14) The TSF and MNF traceback information is in octal addresses instead of line numbers. The line numbers are in parentheses following the octal addresses on the traceback list in the test cases we ran. If your program does not show this, let us know.
  - (15) The FORTRAN intrinsic function RANF is no longer available from PASCAL. To fill this need, we are providing a very high quality, uniform distribution random number generator, available in the PASCAL library. To access this parameterless function, include the declaration  

```
FUNCTION RANDOM: REAL; EXTERN;
```

in your PASCAL program. RANDOM will return a real number between 0.0 and 1.0 each time it is referenced. This routine will become available September 26, and at sometime in the future we will provide a means for altering the random sequence.
  - (16) Time limits are not being processed correctly. After issuing a control card or typing RUN, you will get 20 octal seconds after which the message, TIME LIMIT, is issued. You may enter T,nnn where nnn is the additional octal time desired to complete the request. The total time used by any request must be less than user validation (usually 176 octal seconds). This will work only for the first request because of an error. To get around the problem, the command, SETTL,nnn should be issued before the request needing over 20 seconds, where the nnn is the total maximum central processor time needed by each of the subsequent control cards or RUN's.
- We will publish additional information in SYSNOTES as it arises. Please call or write the UCC HELpline (376-5592) if you find more errors or wish to express your preferences.

## VERSION 3 PRODUCTS

--by H. Kurs

During the past year the version 4 products on the Cyber 74 have proven to be reliable and superior to the version 3 products. The time has come to eliminate the version 3 products. The following list of items will disappear at the beginning of WINTER quarter.

product	description	current access
COBOL	V3 COBOL compiler	PAST(COBOL)
COPYCL	V3 COPY utility	PAST(COPYCL)
SYSMISC	V3 COBOL library	FETCH(SYSMISC)
SORTMR3	V3 SORT/MERGE processor	SORTMR3.
SMTEXT	V3 SORT/MERGE text.	PAST(SMTEXT)

All COBOL 3 and SORT/MERGE 3 users should prepare themselves accordingly for this changeover. The UCC Reference Room has these documents available to aid users in their conversion:

KRONOS 2.1 COBOL 3 to COBOL 4 Conversion Guide (May, 1975)

KRONOS 2.1 SORT/MERGE 3.0 to SORT/MERGE 4.0 Conversion Guide (May, 1975)

KRONOS 2.1 Version 3 to Version 4 Data File Conversion Guide (September, 1975)

If further assistance is needed, please call either John Cosgrove at 373-2522 or Howard Kurs at 373-5754.

## MAG TAPES

--by W. Elliott

The UCC tape library manager, TAPES, is now fully implemented. In general, its presence should be transparent to tape owners. However, attempts to use a reel that you do not own will probably meet with failure unless arrangements have been made with the tape's owner to validate access either on an individual basis (through PERMIT) or on a general basis using SETALL or SET to change the reel access code (RA) and password (PW). This latter method is preferred. See the July 1976 newsletter and WRITEUP(TAPES) for explicit details.

The following options are now available to tape users who store tapes with UCC.

- (1) A password may be associated with a reel; other users must then specify this password to access the reel.
- (2) Six different levels of reel access (RA) may be chosen to control the general mode of use.
- (3) Individual user numbers or groups of user numbers may be permitted an alternate reel access.
- (4) File access (FA) codes currently in force on labeled tapes are over-ridden by the RA defined (owner-only access by default).
- (5) Descriptive comments may be associated with individual reels as a mnemonic to their content.
- (6) Passwords, comments, and reel access codes may be changed at any time without re-writing the magnetic label.
- (7) More security for unlabeled tapes is provided although labeled tapes are still highly recommended since they give the system the opportunity to double check the operator.

Other enhancements are in the planning stages. Your use of TAPES and suggestions for additions and improvements to the routine will be appreciated.

Your first step should be to execute the control card

TAPES.

for a VSN list, or

TAPES,AUDIT,LO=F.

for a detailed list, or

TAPES,AUDIT,LO=F,UN=userid

for a detailed list from an alternate user number. The AUDIT processor lists those reels that you can access. If a VSN you expect is missing under your user number, call the Tape Librarian at 373-4995. If a VSN is missing under an alternate user number, call the owner of that account to arrange access.

## ARCHIVING

--R. Hursh

On or about the first of each month, permanent files not accessed during the previous month are first written to tape and then purged from the disks. Tapes containing these archived files are stored for one year and then re-used. Any users who may want an archived file are reminded that they have only 12 months in which to request restoration. Forms are available at the high speed stations to make these requests. A \$5.00 charge is made for each file restored.

The permanent file archive performed on August 1st required seven 7-track tapes; roughly equivalent to 200,000 sectors of disk space or PRU's. What this means is that about 20% of the total available user disk space was tied up for at least 30 days without being used. The practice of leaving files on the disk until they are archived is an unnecessary expense to the user who leaves them and, at the same time, it prevents other users from making constructive use of a resource that is in very short supply.

UCC encourages ALL users who use permanent files to execute the CATLIST control card at regular intervals (perhaps weekly) so that unused files can be detected and purged. The control card

CATLIST,LO=F,SC.

will give a full listing with the file lengths in sectors. Also, if the user ever uses the auxiliary device, a

CATLIST,LO=F/PN=PF01.

can help prevent the accumulation of unexpected charges by permitting the user to purge unused files.

Questions relating to archived permanent files may be directed to Bob Hursh, 376-5605.

## KEYPUNCH

--by R. Fleagle

Four of UCC's 026 keypunches were recently replaced by 029 keypunches; two at Experimental Engineering and two in room 170H at Lauderdale.

Plans to upgrade additional 026's to 029's will continue as funds permit. However, there is an extremely lengthy waiting period from the time an order is placed to the actual delivery date. This is due to our modified "H" character arrangement requirement.

## SUGGESTION BOX

? I have several complaints about the old but continuing problem at the open shop 1004 sites, that is the abuse of the E,LP card. Since it seems impossible to teach common courtesy to the people causing this problem, I offer the following options as suggestions for protecting the output of 1004 users:

(1) Change the E,LP card to E,LP,username,password. This is the most desirable option since it offers the highest security and the greatest ease of use since the user need have only one card to kill any of his jobs.

(2) Change the card to E,LP,jobname. At least with this version the offender must punch a card. This obviously means that the legitimate user must also punch a card for each job he wishes to kill.

(3) Deactivate the E,LP card. With the new auto divert feature installed, the E,LP card is not as necessary as it once was.

Please feel free to print these suggestions; perhaps a few of those responsible for this problem may be educated.  
R.S.: 30 JULY 1976

A Users should not end outputs just because they are long and the owner is not present. Please use the SUSPEND,AGAIN,PR commands to get your files listed. Your first option is not acceptable since someone could dispose an output to your site by accident and there would then be no way to end it. Option 3 would not work for the same reason. Option 2 is a reasonable alternative but we would like to have other user comments on this change. Please direct your ideas to me at 227 Experimental Engineering.

(R. Franta)

? Please place a timesharing terminal (a computer lab) at Lauderdale. 20 JULY 1976

A UCC does not provide free timesharing access; University Computer Services (UCS) establishes and funds the student timesharing labs and all others must provide their own terminals.

Your suggestion has been referred to the UCS Subcommittee on Timesharing for their consideration.

(M. Skow)

? I would like to commend R. Franta for his expertise in teaching the FORTRAN and KRONOS short courses. I am displeased, however, with the material covered in the intermediate/advanced FORTRAN classes. The amount and content of material covered varies each time the class is given with no regard to the two naming conventions used. Some material is repeated from class to class and some is new. Why not standardize the FORTRAN courses? It is very frustrating when intermediate FORTRAN and advanced FORTRAN are interchanged for very similar courses.

A Thank you for the comments. In the past, I have tried to direct the intermediate/advanced FORTRAN class toward those attending; that is, tailoring the content to the needs of those attending the session. As a result, some comments like yours have been received. To correct this, new class outlines are being prepared to clearly define the three areas (beginning, intermediate, advanced) of FORTRAN classes. This new outline will be used in the fall classes. (R. Franta)

### COMMENT

We have received a helpful list of pointers to problems with the new MERITSS system, specifically in relation to numbers of local files permitted and to a problem in MNF. These are discussed elsewhere in this newsletter. One specific complaint referred to the fact that response time is too fast! The user wants to type CATLIST, CR, clear-screen-key; the catlist begins before the screen is clear, thus losing information. To avoid this, we suggest changing the order, that is, type CATLIST, clear-screen-key, CR.

(T. Hodge)

## from the editor

Those of you who receive and read this newsletter on a regular basis may have noticed that the editor has taken some liberties with both the August issue and this one. We would like your opinions on some changes.

1. Both the August issue and this one have the name "Network News" on the masthead instead of "UCC Newsletter." This name change is provisional; we have received some comments on the change, we would like more opinions.
2. Both the August and September issues have a 3-column rather than than a 2-column format. Most comments received so far have been opposed to this change; we would like more opinions.
3. We have included an "Operations" page and a "Publications" page in each issue of the newsletter for some time but have never received any feedback on the usefulness of these two pages. You may notice that both are missing from this issue. Do you feel these information pages are useful? Should they be included?
4. A third regular page of the newsletter is the usage summaries (see page 6). Do you feel this is useful? Do you have any suggestions for change?
5. For the last year, we have tried to keep the front page for items of immediate importance to all readers. The August issue started news stories on page 1; this issue again uses page 1 as a notice board -- which do you prefer?
6. The table of contents on page 1 of the August issue only listed article names. The table of contents for this issue is a brief abstract of the entire newsletter. Which do you prefer?

To wrap it up -- the editor of this newsletter likes changes; you, as readers, may not. We value your opinions. Please call 373-7744 if you wish to make comments, or address them to:

NEWSLETTER EDITOR  
University Computer Center  
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PRODUCTION USAGE SUMMARIES

CDC Cyber 74

	<u>July 1976</u>	<u>July 1975</u>
Number of jobs un + MIRJE SESSIONS	59,288 ( 68,033)	51,769 ( 61,792)
Central Processor hours	147 ( 188)	124 ( 165)
Mass storage transfers (KPR)	143,478 (194,205)	-
Magnetic tape transfers (KPR)	5,452 ( 7,712)	-
Pages printed	647,544 (769,554)	677,372 (831,557)
Cards punched	426,836 (468,415)	566,238 (612,092)
Microfilm frames produced	4,563 (197,183)	76,764 (233,773)
Tapes mounted	8,874	8,580
Average file storage	750.8 million characters	493.9 million characters
Mean time between failures	11.1 hours	-
Percentage available during scheduled hours	98.8 percent	-

CDC 6400

Number of jobs run	89,555	103,916
Central processor hours	113	73
Terminal hours	10,401	12,219
Number of terminal sessions	19,650	22,333
Maximum number of simultaneous users	64	78
Average file storage	199.8 million characters	165.6 million characters
Mean time between failures	57.0 hours	106.4 hours
Percentage available during scheduled hours	99.6 percent	99.9 percent

(Total including staff development, accounting, and maintenance runs.)

CYBER 74 DOWNTIME SUMMARY -- July 28 - Aug 29, 1976

	<u>Monday-Friday</u> <u>0800 - 1800</u>	<u>other</u>	<u>total</u>
Total possible scheduled uptime hours	230	300	530
Total downtime hours (See schedule A)	8.8	8.3	17.1
Total uptime hours	221.2	291.7	512.9
Uptime percentage	96.2 percent	97.2 percent	96.8 percent
Average downtime per occurrence	25.2 minutes	17.8 minutes	20.9 minutes
Mean time between failure	12.4 hours	10.1 hours	11.0 hours

Subsystem failures

SUPIO	7	22	29
TELEX	5	1	6
EXPORT	1	4	5

Schedule A: downtime hours

	<u>Number of occurrences</u>	<u>total hours down</u>	<u>average minutes downtime</u>
1) Preventive maintenance over-runs	0	0	0
2) Software related problems	7	3.7	29.7
3) Hardware related problems	5	6.8	82.6
4) Indeterminate software/hardware problems	35	53	9.3
5) External problems	2	1.3	40.5

(USAGE STATISTICS, TELEX NOT INCLUDED) AUGUST 1976

Submitted from	total jobs	% of jobs	pages printed	% pages	cards read	% of cards
Lauderdale	4292	7.7	266334	26.4	1882565	17.5
ExpEng I/O	8994	16.1	231373	22.9	2977666	27.7
West Bank	4478	8.0	96022	9.5	1066394	9.9
6400	1526	2.7	0	0	0	0
SUPIO	36430	65.4	414873	41.1	4821627	44.9
TOTALS	55720		1008602		10748252	

# FALL QUARTER SHORT COURSES

The following non-credit short courses will be offered by the University Computer Center during Fall Quarter, 1976. No registration is required. We suggest that you do some preliminary reading before attending a course; the references listed are recommended but you are not required to purchase a text.

## INTRODUCTION TO THE COMPUTER CENTER

A general introduction; equipment, terminal locations, account numbers, job submission, keypunches, tape purchase, necessary forms; how to use the center.

DAYS : Oct 5 (Tuesday)  
 HOURS : 2:15-4:00 PM  
 ROOM : 60 Arch  
 INSTRUCTOR: R. Franta  
 REFERENCES: from instructor

## BEGINNING FORTRAN

A presentation of the basic features of the FORTRAN language. We teach a version of FORTRAN IV.

DAYS : Oct 12,14,19,21,26,28, Nov 2,4  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 136 ChemE  
 INSTRUCTOR: R. Franta  
 REFERENCES: MNF Reference Manual

## COBOL

An introduction to the COBOL language. COBOL is an English-like language suitable for business data processing problems. Areas covered are mass storage, program libraries, other facilities.

DAYS : Oct 26,28, Nov 2,4,9,11,16,18  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 54 ChemE  
 INSTRUCTOR: J. Cosgrove  
 REFERENCES: COBOL V4 Reference Manual  
 (CDC # 60384100)

## LISP

LISP 1.5 is a programming language based on Church's lambda calculus featuring list structures and list processing.

DAYS : Oct 18,20,22,25,27,29  
 HOURS : 3:15 - 5:00 PM  
 ROOM : 21 Aero  
 INSTRUCTOR: A. Mickel  
 REFERENCES: The Little LISPer (Friedman, 1974)

## BEGINNING COMPASS

COMPASS is the assembly language for the CDC 6000/Cyber series machines; CPU instructions, pseudo instructions, macros, hardware organization, interfacing with FORTRAN, CPU common decks, timing. Should have some familiarity with assembly languages.

DAYS : Nov 8,10,12,15,17,19  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 54 ChemE  
 INSTRUCTOR: K. Matthews  
 REFERENCES: COMPASS V3 Reference Manual  
 (CDC # 60360900)

## KRONOS CONTROL CARDS

An introduction to the KRONOS operating system and descriptions of the available control statements.

DAYS : Nov 9,11,16,18,23,30, Dec 2  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 162 ChemE  
 INSTRUCTOR: R. Franta  
 REFERENCES: from instructor

## INTRODUCTION TO SYSTEM 2000

A beginning level of System 2000, teaching how to use a generalized data base management system.

DAYS : Oct 18,20,22,25,27,29  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 50 ChemE  
 INSTRUCTOR: J. Cosgrove  
 REFERENCES: System 2000 Reference Manual

## SYSTEM 2000 PROGRAMMING LANGUAGE INTERFACE

Covers the FORTRAN & COBOL programming language interface portions of System 2000.

DAYS : Nov 1,3,5  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 50 ChemE  
 INSTRUCTOR: J. Cosgrove  
 REFERENCES: System 2000 Reference Manual

## SYSTEM 2000 REPORT WRITER

Covers the Report Writer feature of System 2000.

DAYS : Nov 15,17,19  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 50 ChemE  
 INSTRUCTOR: S. Nachtsheim  
 REFERENCES: System 2000 Reference Manual

## ADVANCED SYSTEM 2000

Covers the advanced features of System 2000.

DAYS : Nov 8,10,12  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 50 ChemE  
 INSTRUCTOR: S. Nachtsheim  
 REFERENCES: System 2000 Reference Manual

## SPSS

This course introduces and explains the uses and methods of SPSS (Statistical Package for the Social Sciences).

DAYS : Nov 16,18  
 HOURS : 2:15 - 4:00 PM  
 ROOM : S132 KoltH  
 INSTRUCTOR: D. Anderson  
 REFERENCES: SPSS (McGraw-Hill)

## BMDP

This course introduces and explains the uses and methods of the BMDP package of programs.

DAYS : Nov 30, Dec 2  
 HOURS : 2:15 - 4:00 PM  
 ROOM : S132 KoltH  
 INSTRUCTOR: S. Yen  
 REFERENCES: BMDP Reference Manual

## SORT/MERGE

A processor used in the sorting and combining of data records.

DAYS : Oct 19,21  
 HOURS : 2:15 - 4:00 PM  
 ROOM : 54 ChemE  
 INSTRUCTOR: H. Kurs  
 REFERENCES: SORT/MERGE V4 Reference Manual  
 (CDC # 60343900)

(continued on page 8)

FALL QUARTER SHORT COURSES (continued from page 7)

RECORD MANAGER

An introduction to Record Manager, the input/output interface for the Level 4 versions of COBOL, FTN, SORT/MERGE.  
DAYS : Nov 30, Dec 2  
HOURS : 2:15 - 4:00 PM  
ROOM : S139 KoltH  
INSTRUCTOR: H. Kurs  
REFERENCES: Record Manager User's Guide (CDC 60359600)

GRAPHICS

This course describes the graphics packages available at UCC. Plotting equipment will be "hands on". Site and time are chosen to permit rapid turnaround for student's plots.  
DAYS : Nov 9,10,11  
HOURS : 7:30 - 9:30 PM  
ROOM : Lauderdale Conference Room  
INSTRUCTOR: M. Frisch  
REFERENCES: from instructor

MAGNETIC TAPES

A seminar on the uses of magnetic tapes.  
DAYS : Nov 2,4  
HOURS : 2:15 - 4:00 PM  
ROOM : 50 Arch  
INSTRUCTOR: W. Elliott  
REFERENCES: from instructor

DEADLINE FOR THE OCTOBER ISSUE OF THIS NEWSLETTER IS SEPTEMBER 23. READER COMMENT IS INVITED.

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