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# acs academic computing services Newsletter

Volume 24, Number 3

University of Minnesota, Twin Cities

March, 1990

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## Electronic Student Directory Now Available

*Lillian Bianchi and Jim Miner*

**A**cademic Computing Services is pleased to announce electronic access to the Twin Cities Student Directory.

The service, called *Lookup*, is available free of charge to anyone who can access the ACS UNIX or VMS systems, either by dial-up or over the campus network.

The electronic directory will be updated each quarter with data provided by Student Support Services, so it will be more accurate than the printed Student/Staff directory. Presently, only students who registered for winter quarter are included in Lookup.

We gratefully acknowledge the help and data provided by Student Support Services.

### **How to Access Lookup**

The electronic directory can be accessed by logging into the VX or UX computer system with the user name LOOKUP and no password. Present users of these systems can also access Lookup from their accounts by typing the LOOKUP command.

Once you have entered Lookup, you can retrieve directory entries by typing the QUERY command followed by part or all of the name of the student. For example,

QUERY JOHN DOE

will look for all students named John Doe, Doe John, John Lyndon Doe, etc. If the error message Too many entries to print appears, you must be more specific in your query.

When done with Lookup, type QUIT to exit.

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# Help Page

## ACS HELP-LINES

### Central Systems (UX,VX,NV,CA):

626-5592 8 am to 5 pm, weekdays

### Artificial Intelligence:

625-8332 3 to 4 pm, weekdays

### Database:

626-1887 10 to 11 am, weekdays

### Liberal Arts, Text Analysis:

625-8332 3 to 4 pm, weekdays

### Statistics:

626-1887 1 to 3 pm, weekdays

## Other HELP-LINES

### LUMINA (communications questions):

626-2272 8 am to 5 pm, weekdays

### Microcomputer and Workstation Networks Center:

626-4276 9 am to 4 pm, weekdays

## Lauderdale Media Library

626-1838 9 am to 3 pm, weekdays

## CONSULTING

### Walk-In

#### ACS, East Bank:

128C Lind Hall 10 am to 4 pm,  
Monday through Friday

#### Microcomputer and Workstation Networks Center:

125 Shepherd Lab 9 am to 4 pm,  
Monday through Friday

## Electronic Mail Consulting

Consulting is now available via the mail facility on all ACS systems (the UX, VX, NV, and CA). Send mail to user name CONSULT for questions after hours and for low-priority questions that are not critical to your immediate computing work. Replies will be sent to your account through the mail facility on your system.

## Instructional Computing Consultant

Department instructors may call 626-0200 for assistance in choosing ACS systems (ENCORE/UNIX, VAX/VMS, CYBER/VE, CYBER/NOS), software, and for answers to any other inquiries on using computers for instructional computing.

## COMPUTING INFORMATION CENTER

128A Lind Hall, 625-7397, MAD@UMNACVX, MAD@VX.ACS.UMN.EDU  
8 am to noon and 1:00 to 4:30 pm, Monday through Friday

**Computing account and grant applications** available for ENCORE, VAX, and CYBER computers.

**Short course enrollment.** Short course schedules and class descriptions available.

**Assistance in ordering vendor documentation.** Vendor documentation is not always available in the University bookstores and may be ordered directly from the company.

**Complete documentation collection.** Reference copies of vendor and all other documentation for ACS software.

**Free ACS documentation.** General information and central system information available.

**Computing Newsletters.** Subscribe to the *ACS Newsletter*. Newsletters from other computing centers are also available for reference.

# acs

## Academic Computing Services

Director, ACS: Michael Skow  
 Editors: Steven Brehe, Paula Goblirsch

The *ACS Newsletter* is published monthly by Academic Computing Services of the University of Minnesota, Twin Cities. Deadline for articles is the 5th of the month preceding publication; deadline for short announcements is the 10th.

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For a free subscription call (612) 625-7397, or send your name and address to the Computing Information Center, 128A Lind Hall, University of Minnesota, 207 Church St. SE, Minneapolis, MN 55455. [MAD@UMNACVX/MAD@VX.ACS.UMN.EDU](mailto:MAD@UMNACVX/MAD@VX.ACS.UMN.EDU). On-campus address changes *must* include your department name and address.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

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### For More Information

Additional examples and capabilities can be found by **HELP LOOKUP** on either the VX or UX system. There is also a help command within Lookup. Finally, you can call the ACS HELP-line at 626-5592 between 8 am and 5 pm, Monday through Friday.

A comprehensive article about the electronic directory service will appear in our next issue.

## Text Scanning Service Now at Lauderdale

*Steven Brehe*  
SKB@UMNACVX

**F**or some years now ACS has provided a text scanning service. Using Kurzweil optical scanning hardware, we can rapidly scan voluminous text, including non-standard fonts and foreign languages, turning printed copy into files on an ACS mainframe or on IBM or Macintosh floppy disks.

The Kurzweil hardware is now located at 156 Lauderdale. As before, the basic rate for the service is \$30 an hour, with a reduced rate if you do the scanning yourself. The charge can be covered by ACS research computing grants.

You can send copy to be scanned to Lauderdale via Campus Mail, or drop it off at 128C Lind Hall or Lauderdale. Please call Carol Winther at 625-9525 before sending your copy to make arrangements for the scanning.

## 140 Blegen May Become Micro Lab

*Richard Hotchkiss*  
HOTCHKISS@UMNACVX

**R**oom 140 in Blegen Hall is currently an ACSnet terminal facility with CRTs, hardcopy terminals, and a fast printer. From these terminals you can access most of the mainframes on campus and LUMINA, the library system. A survey last winter quarter indicated that although the terminals were well used, West Bank users were a minority among users.

Because there is an overwhelming demand for more microcomputer access, this facility *may* be converted to a micro lab when the funds become available, possibly this summer. You could still access the central computing systems from this lab as well as from the other micro labs.

A benefit of this conversion is that the mainframe user could upload and download files and, in general, use each system, micro and mainframe, to its advantage. However, each user would have to have a micro access card and central system users would have to compete with micro users for the use of the micros. Those of you who already use micros as central system terminals know that you have to make some adjustments since micro keyboards do not match standard terminal keyboards, e.g., VTxxx terminals.

Please convey your opinions for or against this change to:

Richard Hotchkiss  
ACS  
100 Laud CF

or E-mail to:

HOTCHKISS@UMNACVX

## ACCSTAT and Other Accounting Details

*Lawrence Liddiard*

LIDDIARD@UMNACVX

LAL@UMNACUX

### ACCSTAT Values Are for Resource Dollar Usage

In July ACS changed its accounting rates from specialized grouping to uniform rate charges. This was an invisible change for most ACS users since the actual costs as reflected on the journal voucher for service charges did not change or were lower because of rate reductions.

Users will have noticed the procedural change in the login message that displayed resource dollars used since July 1. Previously instructional users did not have a message, since they were in a group with a complete grant, but this

year their full dollar use appears. A similar change and problem occurred for commercial users of ACS because their login message and ACCSTAT queries showed the normal internal dollar usage, without the 50 percent surcharge applied.

To determine the actual billing that has been charged on journal voucher forms, use the **RO=J** option when requesting an ACCSTAT display or printout. This will give you the previous month's or year's dollar total actually billed depending on other options selected for the ACCSTAT command. See **WRITEUP,ACCSTAT** on CA to learn more.

To remind users that ACCSTAT mainly reflects resource dollars rather than actual billings, the following paragraph has been added to ACCSTAT displays:

ACCSTAT SHOWS \$ RESOURCES USED BY RESOURCE AND USER NUMBER. \$ RESOURCES CORRESPONDS TO THE RATE CHARGED FOR FULLY FUNDED INTERNAL ACCOUNTS. IF YOUR ACCOUNT HAS A GRANT OR SPECIAL DISCOUNT YOU SHOULD APPLY THIS TO THE TOTAL TO DETERMINE THE AMOUNT THAT WILL BE CHARGED. COMMERCIAL USERS WILL BE ASSESSED A 50 PCT. SURCHARGE ON ALL ITEMS EXCEPT OFFLINE SUPPLY ITEMS.

### Unexpected Increases in the Login Message

When you log in to one of our systems, a message similar to the following one appears:

ACS records show total \$192.86 usage 01JUL89 thru 08FEB90 for *username*.

This line was provided to help users avoid consuming more computing resources than those paid for by the

\$1000 grant. In addition, users could track the amount of computing usage from one day to the next.

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Users have questioned the unexpected increases that the reported value sometimes takes. On most of those occasions, a particular ACS system has had a failure in accounting for one or more resources, and, rather than putting in bad or incomplete data, the information is put in only when validated, which may take several days. Thus the second date, following the word `thru`, is important. If the example line above appears on February 9, you know that accounting is complete for all of the sessions that you completed by the previous day, February 8. On the other hand, if the example above appears on February 15, you know that six days are missing from the total reported.

Again, we remind you that this login total is for uniform rate charges and does not reflect grants for instructional computing or surcharges for commercial use.

## EVE On-line Training Course

*Marisa Riviere*  
MARISA@UMNACVX

**T**he "Introduction to EVE," an interactive training package that teaches you how to use the VMS editor EVE, is now available on VX. The package tells you how to begin EVE and how to use basic editing features to create and edit files in line-editing and full-screen editing. The EVE editor is used by default in many of DEC's current applications and it is likely to be the editor that DEC will be using in the future.

To begin the "Introduction to EVE," type

```
$ RUN EVCBI
```

From that point, simply follow the instructions that appear on your screen. You *must* work from a VT100-compatible terminal. There is no workbook. There is, however, a good EVE manual. Consult the staff at the ACS Computing Information Center if you would like to see or order the manual.

For other on-line training materials, see the Training topic in **MOREHELP**.

## The New VX: Additional Hardware and Software

Marisa Riviere  
MARISA@UMNACVX

**T**his year the ACS VMS VAX 8650, called VX, is eligible to participate in the Campus License Software Grant (CSLG) program offered by Digital Equipment Corporation (DEC) for all eligible DEC systems at the University of Minnesota. The contract provides free or discounted software licenses for a large variety of DEC's software.

To be eligible to participate in the CSLG program, a VMS system may not serve non-University users. Previously, the VAX VX offered a small percentage of its services to non-University customers. Now, for the VX system to comply with the CSLG requirement, ACS is offering its VMS services to non-University users on a VAX 3100 system called VZ. An article announcing the VZ system can be found elsewhere in this issue.

Products available with the CSLG program include easy-to-use tools for developing on-line training courses (such as the VMS and EVE editor courses available now on VX) or tools for developing presentation materials such as transparencies and slides, and basic spreadsheet utilities. They also include complex database management, sophisticated graphics applications, on-line information retrieval systems, and programming languages, compilers, and interpreters suitable for many different types of applications.

Among the first additions to VX from the CSLG program will be the APL and BASIC compilers, which are available without licensing or distribution fees through the program. At the end of this article, we include a list of additional products that may be helpful to the general VX user and available from the CSLG program. The list is not comprehensive, and the availability of products may change from time to time—ACS will install additional software applications on VX when requested by the users. This program will allow us to expand our VMS services without increasing users rates.

In addition to the wealth of software that VX is now eligible to run, two new hardware components may make

the new VX more appealing to our users: the TK90 Cartridge I/O system and the CDROM readers. The TK90 IBM 3480-compatible cartridge units were described in the February issue of this Newsletter. The CDROM readers available from the VZ system throughout the cluster allow read access to optical disk media. One of the first CDROM applications will be to provide on-line software documentation on DEC's Bookreader format for users accessing the system on terminals with window software capabilities.

### Software Available from CSLG

#### Courseware Development Tools

CAS—CAS, the Courseware Authoring System, is a powerful easy-to-learn authoring system for developing and monitoring computer-based instructions used on VT100-type terminals. CAS uses the DAL programming language for computer-based instruction. It features response judging capabilities, including a spelling algorithm, logging of lesson performance, student score information, and full graphics integration.

CDS—CDS, the Courseware Design System is a menu-driven system for developing computer-based instruction materials using predefined video forms called templates. The templates allow you to create multiple-choice lessons, tutorials, and paragraph comprehension exercises. CDS menu options automatically generate a DAL source program from the CDS lesson. The DAL source can be compiled and linked for use with CAS.

Producer—VAX Producer allows you to create visually-based interactive programs such as computer-based instructions (CBI) or interfaces for information retrieval systems. VAX Producer programs include a visual component created by VAX Draw Graphics Editor using the VAX Design Development Language. VAX Draw allows

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the user to create screen displays and store them in a library. VAX Design controls the interaction with the user.

See also VTX and DECforms under "Information Retrieval Systems" later in this article.

## Graphs and Other Tools to Produce Presentation Materials

**DECgraph**—VAX DECgraph is a general-purpose graphics plotting package with menu-oriented user interface. It allows users to create, change, display, and print graphs. DECgraph is easy to use. It can be merged with DECslide to create presentation slides.

**DECslide**—VAX DECslide generates combined text and graphics for presentation materials. It is easy to use. It provides the user with boxes, circles, polygons, and lines. DECslide can create black and white or color 35 mm slides, transparencies, or printed materials.

See also "Courseware Development Tools" earlier in this article, and VTX under "Information Retrieval Systems."

## Text Processing

**Documen**—VAX Document is an electronic publishing system designed to aid VMS users in the production of high-quality technical documentation with integrated text and graphics. It is a tool to automate and manage the entire process of creating technical documents from the first entry of written material to final printed output.

**SCAN**—VAX SCAN is a high-level language designed for text processing. It supports concatenation and substring extraction and comparison. VAX SCAN is powerful for matching and sorting complex text patterns. It is particularly useful for building filters, translators, extractors, preprocessors, and parsers.

## Spreadsheets

**DECalc**—VAX DECalc is an electronic spreadsheet package for creating, editing, and manipulating numbers in a worksheet format. It is designed for use on multiuser systems and over networks. It drives VT100-type terminals. To use DECalc, you need very little previous computing experience.

**DECalc Plus**—VAX DECalc Plus is a multiuser spreadsheet designed for technical, engineering, and scientific environments. It combines spreadsheet applications with the ability to call external routines written in any programming language that supports VMS calling standards.

See also ADE under "Information Retrieval Systems."

## Database Management

**DBMS**—AX DBMS is a multiuser general-purpose database management system. It handles everything from simple hierarchies to complex multi-level relationships. DBMS supports full concurrent access in a multiuser environment without compromising the integrity and security of the database. DBMS interfaces with CDD and most of the VMS high-level languages. The system includes its own off-line full and incremental database backup and restore capabilities.

**RALLY**—VAX RALLY provides a powerful fourth-generation language environment for developing applications. It integrates with and provides tools for integrations with Rdb databases, forms, reports, menus, and on-line help. It allows users to create simple applications using menu interfaces or to construct more sophisticated applications using its own editing environment.

**Rdb**—VAX Rdb is a full-function relational database management system that greatly increases programming productivity by allowing users to create, change, and query databases easily. Rdb can be the ideal solution when programming needs are diverse and human resources limited. Rdb provides network capabilities for database maintenance and access. It includes interfaces to COBOL, BASIC, Fortran, C, and Pascal.



See also the section on "Spreadsheets" earlier in this article.

## Information Retrieval Systems

**VTX**—VAX VTX is an easy to use menu-driven information retrieval service that lets the user navigate through a tree-structured information base. The VTX information base consists of full-screen pages of information. VTX provides a nontechnical person with both quick access to the system and the ability to peruse on-line information without training. VTX has extensive on-line help capabilities. VTX also provides menu-driven utilities for the maintenance of the database.

**DECforms**—DECforms is DEC's VMS implementation of the ANSI/ISO standard for a Form Interface Management System (FIMS). It is easy to use, provides efficient distribution and forms processing, flexible user control, and programming language independence. DECforms architecture maintains true separation of the application program that is concerned only with the processing of the data and the data-gathering display for the user's interface.

**ADE**—VAX ADE allows users to produce and use simple applications without learning programming techniques or languages to organize administrative and clerical data. The user defines a Worksheet by naming the column headings needed for the data. The Worksheet can be changed at any time. ADE reports can selectively include all or parts of the data. It has extensive on-line help and training capabilities. One of its more useful features is the creation of verbs, which are names users can give to a specific sequence of commands to be performed by simply entering the verb's name as a command.

See the sections on "Courseware Development Tools" and "Database Management" earlier in this article.

## Graphics

**GKS**—GKS 3D VAX Graphics Kernel System (GKS) is a library and application development tool that applica-

tion programmers can use to produce device-independent computer-generated graphics. GKS implements ISO and ANSI standards. The GKS metafile allows transporting information from one VAX GKS application to another, and storing nongraphical information. GKS device handlers can be developed in Fortran, C, and Pascal.

**PHIGS**—VAX PHIGS (Programmers Hierarchical Interactive Graphics Systems) is a sophisticated three-dimensional graphics support system that controls the definition, modification, and display of hierarchical graphics data. It manages the organization and display of graphical data stored in a centralized database. PHIGS closely conforms to the 1986 ANSI standard for 3D device-independent graphics libraries. PHIGS data elements—polylines, polymarkers, etc. from its graphics database—can be edited, transformed, selected, labeled, and restructured at any time by the application program. Users can redefine working coordinates for viewing and control multiple simultaneous views of the same picture on separated display surfaces.

## Languages

**APL**—VAX APL is a concise programming language and interpreter that can be used for a wide range of applications. APL simplifies the handling of numeric and character data organized as lists and tables. It provides a built-in function editor, debugging aids, system communication facilities, and a file system.

**BLISS-32**—VAX BLISS 32 is a high-level structured programming language, designed for operating systems and VAX hardware-related applications. It supports development of modular software according to structured programming concepts by providing an advanced set of language features.

**CORAL 66**—VAX CORAL is a high-level, general-purpose, block-structured programming language oriented toward industry and commercial applications. CORAL 66 is defined as the British standard specification for programming languages. Designed to replace assembly-level programming, it is useful for long-life applications requiring easy maintenance and flexibility.

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**DIBOL**—VAX DIBOL is a high-level procedural language for interactive business data processing. DIBOL provides efficient terminal handling and access to VAX Record Management Services. VAX DIBOL is based on the Standards Organization's DIBOL-83 definition of the language.

**PL/1**—VAX PL/1 is a block-structured comprehensive programming language that supports scientific computation and extensive string manipulation. Its extensions include compatibility features with industry-standard implementations and ANSI full language features, as well as VMS system-specific features.

See also RALLY under "Database Management" and SCAN under "Text Processing" earlier in this article.

## **Data Privacy Enhancements**

**Encryption**—The Encryption package is a set of utilities that enable users to provide additional privacy protection on their data and files. Once data is encrypted, only users knowing the encryption key are able to decrypt it. The package contains the implementation of DES (Data Encryption Standards) from the U. S. National Bureau of Standards.

## **VMS to PC Communication**

**PCSA**—VAX PCSA provides a framework for integrated network communication with the DOS environment personal computers. Allows VMS to act as a file, print, mail, and disk server.

## The VZ System for Non-University VMS Users

*Marisa Riviere*

MARISA@UMNACVX

**I**n the past months the VX system has been quite saturated with user's jobs. To ease this situation, last January we transferred a major group of VMS users to a VAX 6400, but the change did not provide enough CPU cycles on VX.

Also, in the past year Digital Equipment Corporation has provided low-cost umbrella licenses through the Campus Software License Grant program (CSLG) for University VAX systems serving only internal University users. Because of the extent and variety of this software, ACS is making the VAX 8650 VMS system, VX, eligible for the discount CSLG program.

A new system, dedicated to non-university users, is the ideal approach to respond to both demands. Thus ACS is transferring its non-University VMS consumers to a separate system, a VAX 3100, named VZ, which is scheduled to be available for production on March 15. The VZ system will be part of the ACS VMS cluster.

The VAX 3100 has 24 MB of memory and a CPU power of 3.8, making it almost equal in power to the original VAX 8600. According to our usage statistics, the VZ system will provide expansion room for our non-University users, who should benefit by the increased response time on the VZ.

We are installing on the VZ system a subset of the VX software that should support the computing needs of its users. The VZ system will have DEC's Fortran, Cobol, and C compilers, Rdb, and the Language Sensitive Editor, LSE. For software from third-party vendors, VZ will run

PicSure, SPSS\*, BMDP, RATS, SAS, and SIR. All ACS-developed VMS software will be available. ACS will install additional software when non-University users require it.

VZ users will have access to VX disks that are common to the cluster, and to all the ACS printers that are now available from VX. (For example, users now on USERA: will stay on USERA:.) They may also access CDROM readers, new peripherals that VZ brings to the cluster. Among other applications, the CDROM readers provide on-line software documentation for users accessing the system through terminals with window software capability. VZ users will be able to access tapes through batch jobs.

Rates for CPU, I/O, and other account resources on VZ will be scaled proportionately to the CPU power of the system, but cost 10 percent less than on VX. Records of the status of the VZ user accounts will be permanently available on-line as they now are on VX.

If you are a non-University user of the ACS VMS system you should have already received a letter with additional details about the transfer of your account to VZ. Please contact us if you did not and you think you qualify as such. To see if your VMS user name is a non-University account, type SHOW PROCESS /ALL while on the system. If the account name field, which shows the billing account, begins with ZZZ, your account is a non-University account. For questions, or if you think you will need special help for this change, please contact the ACS HELP-Line at 625-5592.

### IMSL 10 Update on NOS/VE March 18

*Michael J. Frisch*  
MJFRISCH@UMNACVX  
MJFRISCH@VX.ACS.UMN.EDU

**O**n March 18, we will be installing an update to the IMSL Version 10 library on the CYBER NOS/VE (NV) machine. IMSL, Inc., is calling this update Version 1.1.

The access method to use the library will be the same as before. Use the command: **ATTL IMSL** to attach the library to your library search list. See also the information in **WRITEUP, IMSL** that is a one-page document.

The update corrects certain errors in IMSL routines. A five-page summary of the corrections is given by the command: **WRITEUP,IMSL10UPD**. An IMSL Version 10 documentation update has also been published. The price for this is \$27 for the complete update set which is to be inserted in the seven-volume loose-leaf manual set. Contact the ACS Computing Information Center, 128A Lind Hall, 625-7397 for details on how to order the documentation update.

Note to IMSL10 users on the ACS VAX VMS (VX) and CYBER NOS (CA) machines: IMSL, Inc. will be releasing corresponding update corrections for these systems in the near future. We plan to install the updates during the first quarter break after we have received them.

### RATE 2.0 Installed on VX and CA

*Bruce Center*  
BAC@UMNACVX

**W**e have installed RATE 2.0 on VX and CA. RATE is a Markov-chaining package, designed to estimate parameters of change in categorical variables from event-history data. RATE is documented in *Invoking RATE* by Nancy B. Tuma, which is available at the Computing Information Center in 128A Lind Hall.

For help in calling the package on VX, type:

**\$ HELP RATE**

or on CA, type:

**WRITEUP, COMMAND=RATE**

## ACS Central Systems Spring 1990

Registration begins March 12

Central Systems courses are *free*. To register call 625-7397.  
Some classes have size limitations: Register early.

### Introductory Courses

Introduction to Computing		April 2-11	MW	2:30-4:30 pm
UNIX Overview	Section 1	April 3	T	2:30-5:00 pm
	Section 2	May 8	T	2:30-5:00 pm
Overview of the NOS 2 Operating System		April 10	T	2:30-5:00 pm
Introduction to the VMS Operating System		April 17-26	TTh	2:30-4:30 pm
Overview of the NOS/VE Operating System		April 20	F	2:30-5:00 pm

### Elective Courses

vi: UNIX Editor	Section 1	April 5	Th	2:30-5:00 pm
	Section 2	May 18	F	2:30-5:00 pm
Using SPSS* (Statistics Package)		April 30-May 4	MWF	2:30-4:30 pm
INGRES (VAX Data Base Package)		April 16-25	MW	2:30-4:30 pm
Using SAS (Statistical Analysis System)		May 7-11	MWF	2:30-4:30 pm
Math and Engineering Software		May 14-16	MW	2:30-4:30 pm
Electronic Mail and Networks		May 15-17	TTh	2:30-4:30 pm
C Programming		May 21-25	MWF	2:30-4:30 pm

### Registration Information

**Prerequisites:** Please check the course description list to see if there are any prerequisites for the class you are interested in. Instructors will not be able to review any prerequisite information. For more information on prerequisites, call the Computing Information Center at 625-7397.

**Limits:** Some central systems classes have limits to class size. Please try to register early to be sure of getting a place. If you decide to cancel from a class, please do so as soon as possible, so that we can make the space available to others.

**Registration:** Registration is located at ACS's Computing Information Center, 128A Lind Hall. (Hours: 8:00 am to noon and 1:00 to 4:30 pm, Monday through Friday.) To register, call 625-7397. Mail registrations will be accepted. You can also register by electronic mail—write to MAD@UMNACVX or MAD@VX.ACS.UMN.EDU. Include a daytime phone number. Please call to cancel if you later decide not to attend, so we know how many to expect. Deadline for registering is 4:00 pm on the last working day before the class begins. For registration information, call 625-7397.

**Note:** Monday, May 28, is a University holiday. No classes will be held.

## Course Descriptions

**INTRODUCTION TO COMPUTING.** An introduction to basic terms and concepts in computing. Students receive free computer time to practice basic procedures like logging in, creating and editing a text file, etc. Four meetings.

**OVERVIEW OF THE UNIX OPERATING SYSTEM.** An overview of the UNIX operating system, running on the ENCORE UMAX. Logging on and off; Simple utilities; Files and directory structure; Access permissions; The Shell, redirection, pipes and filters; Metacharacters; Editors-ed, vi; Mail, write, talk, mesg; Compilation and execution, (Fortran, C, Pascal); Background and foreground; Processors, Shells and subshells. One meeting.

**OVERVIEW OF THE NOS 2 OPERATING SYSTEM.** Hardware, software, commands, and conceptual background of the CDC Network Operating System, Version 2.5 running on the CYBER CA. Topics include: File concepts; XEDIT basics; Command syntax; Temporary, permanent, and local files; Subsystems. One meeting.

**INTRODUCTION TO VMS OPERATING SYSTEM.** Overview of the VMS 5.1 operating system running on the DEC VAX 8650. Hardware and software; Logging on and off; Utilities; Files and directory structure; Commands and syntax.; the EDT editor; Symbols and logical names; Procedure files; Batch jobs. Four meetings.

**OVERVIEW OF THE NOS/VE OPERATING SYSTEM.** An overview of the NOS/VE operating system used on the CYBER NV. Topics will include: Command syntax; File and catalog concepts; On-line documentation; File attributes and manipulations, Compilation and execution of programs; Procedures and programs as commands; Batch jobs. This is *not* a class for computing beginners. One meeting.

**VI: UNIX EDITOR.** Editing files on UNIX systems with ex (line editing) and vi (full screen editing). All the commands will be covered. Additional topics include terminal definitions, '.exrc', view, and examples of where an ex command is superior to a vi command in ease of use. One meeting.

**USING SPSS (Statistical Package).** Basic structure, job setup, and required statements; data manipulation and selection, commands that control internal and external files. Familiarity with CYBER NOS 2 and XEDIT, or VAX/VMS operating system and EDT editor, or equivalent knowledge, is required. The first session will be a brief review of NOS 2 and XEDIT for beginners. Three meetings.

**INGRES (DATABASE Package).** Learn to use INGRES on the VAX 8650 computer. Topics include creating databases, retrieving information using the English-like language QUEL, creating "ad hoc" reports, and using Application-By-Forms to develop data entry, data manipulation, and report generation. Four meetings.

**USING SAS (Statistical Analysis System).** Basic structure, job setup, and required statements, data manipulation and selection, commands that control internal and external files. Prerequisites: Familiarity with VAX/VMS operating system and EDT editor is required. Three meetings.

**ELECTRONIC MAIL AND NETWORKS.** Introduction to electronic mail and networks. Mail on the VAX 8650; sending, receiving, and managing mail, commands. BITNET addressing and uses. Other networks. Prerequisites: *Introduction to VMS Operating System* or experience using VMS. Two meetings.

**C PROGRAMMING.** This course will introduce the C programming language (new ANSI Standard). Topics include: programming style, flow control, statements and operators, program structure, data types, pointers, functions, arrays, standard I/O, and the system interface. Some programming background is necessary. No operating system will be taught, but a class account will be available on ACS's UX (UNIX) and VX (VMS) systems. Three meetings.

## Microcomputer and Workstation Networks Center Spring 1990

Registration begins March 15

### General

Strategies for Networking  
Microcomputers and Workstations

	May 2	W	1:30-4:00 pm	Free
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### IBM and Compatible Courses

Limited to 10 people.

FEES: ① University students, ② U staff/faculty, ③ Non-University persons

① ② ③

Introduction to Micros-PC/MS-DOS

Section 1	April 3-5	TWTh	2:00-4:00 pm	\$40,\$50,\$80
Section 2	April 25-27	WThF	10:00-noon	\$40,\$50,\$80
Section 3	May 14-18	MWF	2:00-4:00 pm	\$40,\$50,\$80

Orientation for IBM Campus Network Users

Section 1	April 6	F	9:00-10:30 am	Free
Section 2	April 18	W	10:30-noon	Free
Section 1	May 11	F	2:30-4:00 pm	Free
Section 2	June 1	F	10:30-noon	Free

Mastery of *Introduction to Microcomputers-PC/MS-DOS*, or equivalent knowledge,  
is required for the IBM courses listed below.

① ② ③

Hard Disk Commands

Section 1	May 2-4	WF	2:00-4:00 pm	\$40,\$50,\$80
Section 2	June 5-6	TW	10:00-noon	\$40,\$50,\$80

Writing DOS Batch Files

	May 10	Th	2:00-3:30 pm	\$20,\$30,\$50
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Introduction to OS/2 Operating System

	May 9	W	1:30-4:00 pm	Free
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Introduction to dBase IV

Section 1	April 3-5	TWTh	10:00-noon	\$40,\$50,\$80
Section 2	May 1-3	TWTh	10:00-noon	\$40,\$50,\$80

Programming in dBase IV\*

	April 12-13	ThF	1:30-4:00 pm	\$40,\$50,\$80
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Introduction to Paradox

	April 18-20	WThF	1:30-4:00 pm	\$40,\$60,\$90
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# Short Courses

Beginning Lotus 1-2-3					
Section 1	March 29-30	ThF	1:30-4:00 pm	\$40,\$50,\$80	
Section 1	May 15-16	TW	9:30-noon	\$40,\$50,\$80	
Lotus 1-2-3 Macros	June 4	M	1:30-4:00 pm	\$40,\$50,\$80	
Introduction to Microsoft Excel	May 1-3	TTh	1:30-3:30 pm	\$40,\$50,\$80	
Introduction to WordPerfect 5.0					
Section 1	April 9-10	MT	1:30-4:00 pm	\$51,\$61,\$101+	
Section 2	May 17-18	ThF	9:30-noon	\$51,\$61,\$101+	
Section 3	June 5-6	TW	1:30-4:00 pm	\$51,\$61,\$101+	
Intermediate WordPerfect 5.0*	May 7	M	1:30-4:00 pm	\$25,\$35,\$60	

+The fee for this class includes the cost of a workbook. You can pick up the workbook when you register for this class.

\*These classes have additional prerequisites.

## Macintosh Courses

Hands-on. Limited to 10

FEES: ① University students, ② U staff/faculty, ③ Non-University persons

					① ② ③
Macintosh Fundamentals					
Section 1	March 28	W	1:30-4:00 pm	\$10,\$10,\$10	
Section 2	April 11	W	1:30-4:00 pm	\$10,\$10,\$10	
Section 3	April 24	T	9:30-noon	\$10,\$10,\$10	
Section 4	May 8	T	1:30-4:00 pm	\$10,\$10,\$10	
Section 5	May 22	T	1:30-4:00 pm	\$10,\$10,\$10	
Orientation for Macintosh Campus Network Users					
Section 1	March 27	T	2:30-4:00 pm	Free	
Section 2	April 13	F	10:30-noon	Free	
Section 1	April 30	M	2:30-4:00 pm	Free	
Section 2	May 22	T	9:00-10:30 am	Free	

Mastery of *Macintosh Fundamentals*, or equivalent knowledge,  
is required for the courses listed below.

					① ② ③
Introduction to Word					
Section 1	April 19-20	ThF	9:30-noon	\$35,\$45,\$85	
Section 2	May 10-11	ThF	9:30-noon	\$35,\$45,\$85	
Section 3	May 15-17	TTh	1:30-4:00 pm	\$35,\$45,\$85	
Intermediate Word*					
Section 1	March 29-30	ThF	9:30-noon	\$35,\$45,\$85	
Section 2	May 21-23	MW	9:30-noon	\$35,\$45,\$85	



## Short Courses

Introduction to Excel 2.2					
	Section 1	April 16-17	MT	1:30-4:00 pm	\$35,\$45,\$85
	Section 2	May 23-25	WF	1:30-4:00 pm	\$35,\$45,\$85
Intermediate Excel 2.2*					
		May 29-30	TW	1:30-4:00 pm	\$35,\$45,\$85
Using Hyper Card					
	Section 1	April 10-11	TW	9:30-noon	\$35,\$45,\$85
	Section 2	May 24-25	ThF	9:30-noon	\$35,\$45,\$85
Introduction to Desktop Publishing–PageMaker					
	Section 1	April 26-27	ThF	1:30-4:00 pm	\$35,\$45,\$85
	Section 2	June 7-8	ThF	1:30-4:00 pm	\$35,\$45,\$85
Introduction to File Maker					
		May 8-9	TW	10:00-noon	\$35,\$45,\$85
Intermediate File Maker					
		June 7-8	ThF	10:00-noon	\$35,\$45,\$80
Introduction to Programming the Macintosh Using Pascal*					
		April 23-25	MTW	2:00-4:00 pm	\$35,\$45,\$85
Using HyperTalk*					
		May 31-June 1	ThF	1:30-4:00 pm	\$35,\$45,\$85
Preparing a Dissertation on the Macintosh					
		May 4	F	9:30-noon	\$15,\$25,NA

\*These classes have additional prerequisites.

### Registration

**Registration:** *Registration is handled by the Microcomputer and Workstation Networks Center.* Registration for Spring Quarter 1990 begins Thursday, March 15. You can register in person at the Microcomputer and Workstation Networks Center in room 132 Shepherd Labs, Monday-Friday, 8-noon and 1-4 pm or by mail. Classes are filled in the order registration is received. Fees must accompany your registration. You can pay fees by cash, check, or journal voucher. The deadline for registration is 4:00 pm on the working day before the class begins. For additional

registration information, call the Microcomputer Center at 625-1300.

**Cancellations:** If you cannot attend a class, call the Microcomputer Center at 625-1300 to arrange a refund and *to enable us to contact people on our waiting lists.*

**Refunds:** No refunds will be made if you cancel your registration *within 48 hours of the beginning of a class.* However, if we must cancel a class, we will refund your registration fee in full.

## Conventions

Throughout this and other ACS publications, we have adopted these conventions:

- Messages and prompts from the ACS computers appear in plain type, like this.
- Words that the computer systems replace with a specific name, value, or other information appear in *italic type, like this*.
- Commands you type at your terminal keyboard appear in **bold face type, like this**.
- Words that must be replaced by a specific name, value, or command that you type in appear in ***bold italic type, like this***.
- Comments to interactive sessions and program files are enclosed in { curly braces, like this }.

Here's an example:

**SAVE***filename*

is a command you type in. You type **SAVE** and replace *filename* with the name of your file. The system may respond with the message

*filename* ALREADY PERMANENT { An example of a system message. }

where *filename* will be replaced by the name of the file you attempted to save.

- The symbol <CR> refers to the carriage return (or RETURN) key on the terminal. The <CR> serves as a terminator for commands you type at your terminal. In most cases we do not show <CR>; we assume you know to type it after every command.

# Phones/Hours/Labs

## ACS PHONE NUMBERS

Administrative Office: 626-1600  
HELP-Line 626-5592

Access:

ACS systems (UX, VX, NV, CA)  
3/12/2400 bps + 7/Even/1                   **626-1630**  
12/2400 bps + 8/None/1                   **626-1631**  
**LUMINA**                                       **626-2206**

Accounts:

ENCORE , VAX, CYBER CA, CYBER NV,	625-1511
Computer Hours (recorded message)	626-1819
Computing Information Center, 128A Lind	625-7397
Contract Services	625-2303
East Bank I/O, 128B Lind Hall	625-5082
Engineering Services	625-1595
Equipment Maintenance/Repair	625-1595
FAX	626-7440
Graphics Software	626-5592
Information, Lauderdale	626-1600
Lauderdale Computer Room/Services	626-0550
LUMINA	626-2206
LUMINA Consultant	626-2272
Math and Engineering Software	625-5830
Media Librarian	626-1838
Microlab (WBCS-170 Anderson)	624-6526
Newsletter Subscription	625-7397
Permanent File Restoration	626-0595
Public Labs (with ACSnet)	
140 Blegen Hall	624-5278
B40 Central Library	no phone
270 Diehl Hall	624-3128
4-204/4-250 EE/CSci	625-9081
121 Elliott Hall	624-0866
14 Folwell Hall	625-4896
1 Lind Hall	625-0801
128C Lind	625-5082
308 Mechanical Engineering	625-7352
9 Walter Library	626-1899
MWNC Lab Manager (14 Folwell Hall)	625-7850
Publications Information	626-1093
Short Course Registration	625-7397
Shuttle Bus Service	625-9525
System Status (recorded message)	626-1819
West Bank Computing Services	624-0877

For the phone numbers of consulting services, see the Help Page.

## PUBLIC LABS TWIN CITIES CAMPUS

	Central System Printing	Interactive	Micro
<i>East Bank</i>			
ApH 117			X
Arch 148			X
CenH		X	
ComH		X	
DiehlH 207, 270	L	X	X
EddyH Annex 54			X
EE/CSci 4-204/250	I, L	X	X
EltH 121	I, L	X	X
FolH 14, 14a	L	X	X
FronH		X	
LindH1	I	X	
LindH 26			X
LindH 128C	L	X	
LindH 306B			X
MasCanCtr M39		X	
MechE 308	I	X	
MoosT 8-425			X
Phys 130	L	X	X
PioH		X	
SanH		X	
TerrH		X	
VinH 203			X
WaLib 9	L	X	X
<i>West Bank</i>			
AndH 170	L		X
BlegH 140	I	X	
MdbH		X	
OMWL B2			X
<i>St. Paul</i>			
BaH		X	
CentLib B40	I	X	
CentLib B50			X
ClaOff 135	L		X
McNH 69			X
Vet 436			X

I - Impact line printers.  
L - Laser printers.

## SYSTEM OPERATING HOURS

The ENCORE UX, VAX VX, CYBER NV, and CYBER CA systems run continuously from 6 pm Sunday until 6 am the following Sunday. The systems are in unattended production mode Saturday and Sunday from midnight until 6 am. It is unlikely that any tape requests or printing will be processed during these hours. Normal operations resume at 6 am each day except Sunday.

On the first and third Fridays of each month from 5 am to 7 am the CYBER CA and NV systems are unavailable. Low-rate hours are from 8 pm to 8 am Monday through Friday, and all operating hours on Saturday and Sunday.

## ACS Newsletter Subscription Request

Send to ACS Computing Information Center, 128A Lind Hall, 207 Church St. SE, Minneapolis, MN 55455

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