

“Teleclasses” for Materials Education

The use of modern technology to enhance science and technology education is vividly illustrated by one of the fastest growing research consortia in the United States. In the summer of 1985, the Microelectronics Center of North Carolina (MCNC) completed the phase of their television network connecting the MCNC central laboratory with six institutions: the University of North Carolina at Chapel Hill and at Charlotte, North Carolina State University at Raleigh, Duke University in Durham, North Carolina A&T in Greensboro, and the Research Triangle Institute in Research Triangle Park. Other campuses will be added in the future. The participating institutions can interact and share resources through video conferencing, teleclasses, shared seminars, and data networking. More than 50 teleconferences involving over 1000 participants have been held so far.

This spring, 14 microelectronics and computer-related teleclasses are being offered through the participating universities. The two-way video with voice-activated television camera allows the initiating lecturer from any site to interact with students at any other site. Exchange, and sometimes debate, can be induced among students at all participating sites.

Sharing the teaching through teleclasses reduces the teaching load for individual faculty members, allowing each more time to devote to research, and students get the very best instruction since the faculty can teach almost exclusively in their prime areas of research. For example, the course entitled “The Chemistry and Physics of Semiconducting Materials” at the University of North Carolina is called “Integrated Circuits Engineering” at Duke University.

The teaching load is shared as follows: at University of North Carolina-Chapel Hill, Gene Irene teaches crystal growth, oxidation, MOS, and CVD; Wei-Kan Chu teaches ion implantation, annealing, and metallization; and Tom Mayer teaches lithography, reactive ion etching, and thin film deposition. At Duke University, Richard Fair teaches diffusion, epitaxy, and device yield and failure. The course is also offered to students at North Carolina State University and to members of the MCNC.

Scheduling problems do occur in multi-university teaching. Spring vacation, for example, occurs at different times at the participating institutions. A lecturer may find himself occasionally lecturing to an empty room while students are on spring break. Missed classes, however, are easily made up by viewing a video tape of that particular lecture.

Teleconferences can be organized at considerable savings in travel time between the campuses—and therefore at great energy savings to all participants as well.

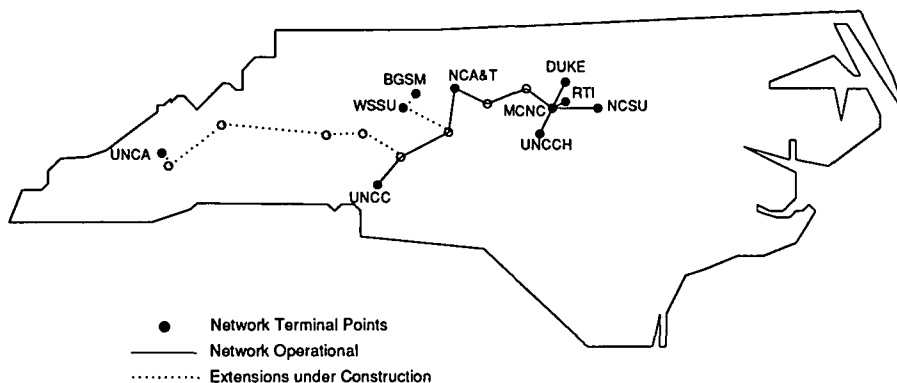
Seminars and colloquia are ideally suited to multi-campus interaction via this television network. Prof. John Hren has organized a well received series of “Materials Science and Engineering Seminars” for the past year. Frequently, an invited speaker from outside the Research Triangle area will spot an old friend in the television audience and renew acquaintance through the two-way video system!

This teleconference network, probably the first one developed on such a scale, is having great impact on education and research in North Carolina. It effectively breaks campus barriers and promotes greater interaction among students, faculty, and the scientific community at large.

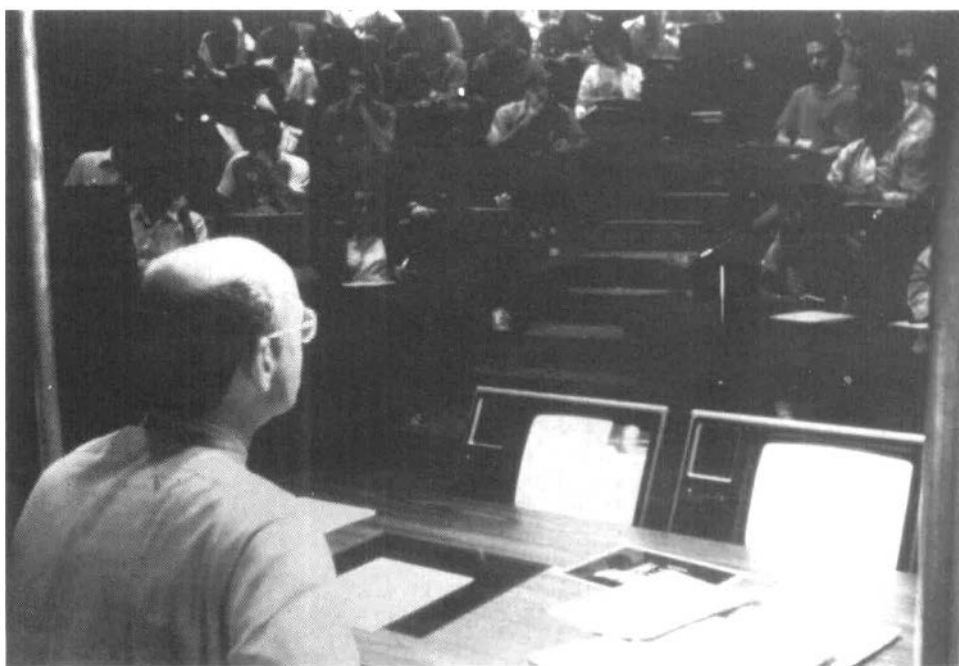
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MCNC COMMUNICATIONS SYSTEM EXPANSIONS



Existing MCNC communications system and proposed expansions.



Prof. Alan Biermann (Duke University) teaches a “teleclass” in computer science.