SABBATICAL LEAVE
September - June, 1982 - 1983

R E P O R T

Presented to
The Board of Trustees
Mt. San Antonio Community College Dristrict
Walnut, California

From
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INTRODUCTION

I wish to express my sincere appreciation to the Board of Trustees of Mt. San Antonio Community College District for the opportunity afforded me in granting this sabbatical leave. The Board, by their generosity, has made it possible for me not only to develop my professional growth by visting community colleges throughout the United States, but also to improve my professional education thru advanced studies.

This sabbatical leave (see appendix -A) also afforded me the time to visit industrial and manufacturing enterprises in the United States, to see some of our great national historical sites and to take a short trip to Alaska, Okinawa and Japan.

Planning for the sabbatical involved four stages.

1- professional studies toward the Ed.D in Vocational education

2- visitations to selected community colleges to study their programs in Drafting Technology, Computer Aided Design, and Robotics

3- visits to industrial and manufacturing industries, and when possible attend vocational seminars

4- travel overseas when time and funds allow

This report presented in brief form gives only the

highlights of the sabbatical leave as outlined in the four stages listed above. So much material was obtained during the visitations that it would not be feasible to present it all in this report.

The body of the report describes the community colleges, universities and private schools visited. A brief description is given of some of the more important visitations and my own impressions of the program presented and the facilities provided.

OBJECTIVES

The objectives for taking this sabbatical leave was to afford me the time to work on an advanced degree, to visit community colleges during school hours when students were present, to visit industrial and manufacturing facilities whenever possible, and to travel abroad if time and funds were available.

I believe education is the salvation of this country, and I was interested in viewing at first hand how the program and facilities at Mt. San Antonio College compare to community colleges throughout California and in other states.

PLANNING

In an effort to utilize my time and funds available better the following plan was used. I tried to plan my route across the United States to use the best possible highways, to select the best possible weather conditions, and to use as many facilities as I could along the way as a cost saving factor as often as possible. I planned to travel in California during the fall semester of 1982 and to travel east to other states during the spring semester of 1983.

A- PROFESSIONAL STUDIES

Since completing all of the course work in the Vocational and Occupational Education program for the Ed.D. at Nova University, I was most anxious to get a fresh start and complete the Major Research Project (MARP) as soon as possible. However, because of family problems I was forced to withdraw from the program for two years. All previous work had to be redone and another research project developed. I decided to complete as much as I could during the fall semester and save the spring semester for my travels and visitations.

B-COMMUNITY COLLEGE VISITATIONS

In order to gain the most benefits from this sabbatical leave, many hours were spent investigating community colleges with high enrollments in the areas of advanced technical drawing and design. I was specifically interested in Electronic Drafting, Mechanical Design, Computer-Aided Design (CAD) and Robotics. The plan was to use the warm weather during the spring semester for college visitations in other states than California. I would visit community colleges in California during the fall semester when convenient.

A revised letter of introduction was developed for community colleges outside of California (see appendix- B) requesting the services of a contact person and their telephone number. It was also requested that the curriculum or program

offered be given and that the directions to reach the college be given if in a city of any large size or in an out of the way location. It was also requested, if possible, that a contact person in local industry be provided. The intent was to arrange a visit and to become familiar with industry today and how it relates to the educational needs of our students.

Planned visits to Industrial/Vocational conferences and seminars were made when knowledge of such events were known

C-INDUSTRIAL VISITATIONS

Contacts were made to visit industrial facilities in conjunction with my visits to community colleges around the country. Prior arrangements were made whenever possible.

D-TRAVEL OVERSEAS

The opportunity for travel overseas was too tempting and I set out to visit Japan, England and Germany. I applied for a U.S. Passport on November 6, 1982 and received it on December 1, 1982. Visits were then made to the Japanese, Korean, Philippine, British and German legations in Los Angeles to arrange for the necessary visas. Visa documents were obtained in December to insure proper entry and exit from each county. Special visas were needed in the Philippines, Korea and Japan. Only the American passport was needed for entry into England and Germany.

I met with M. Yutaka Matsuda of the Commercial Section, Consulate General of Japan to arrange for a contact in Japan. He was of no help and referred me tothe Nissan Motor Company headquarters in Carson. A phone call produced no results and so I went to the headquarters office. There I was given the name and the number of a contact, Mr. Yukihito Eguchi, Manager International Public Relations.

At the Korean legation, I met with Mr. Kyung Soo Sohn, Education Attache, Consulate General. He provided me with the name and phone number of Professor Kyoil Lee at the Seoul University.

A visit to the British Consulate General provided me with address of Oxford & Cambridge Universities; but no contact person. I was told to arrange a personal contact on my own.

The German legation was quite unusual. I did not meet with anyone, but spoke through a mike in the wall to a clerk in the inner office. I was directed to the German Chamber of Commerce. There I was given the address of the VW plant I wished to visit but no contact person. I was told to make my own personal contact.

I did not request information from _the Philippine legation because I did not plan to visit the country. However, a visa is required if I had to pass through the country enroute to Japan.

Foreign travel was quite an experience and an education. From California I flew to Alaska, Okinawa and then to Japan. From Virginia I attempted to fly to Spain, and then to England and Germany, but was unable to do so because my time was getting short and passenger travel was to crowded for immediate departure.

SCHEDULE OF EVENTS

The following schedule of events occurred as planned to meet the objectives of the sabbatical leave. They are listed below in six different categories for better reporting purposes.

A-PROFESSIONAL STUDIES

The winter months of the fall semester were spent on professional studies for the degree requirements.

My original research project (MARP) was a study on the recruitment and retention of vocational education students at the California Community College. Since this objective has been fully accomplished, I had to investigate the possibility of a new research project. After much deliberation and consultation, I decided to investigate the role of the Dean of Occupational/Vocational Education at the California Community College. In this way I hope to learn as much as I can about the duties and responsibilities of the Dean.

I made the decision after meeting with new deans recently appointed to the position of Dean, Occupational/Vocational Education in Southern California. I met with Mr. Dick Wright, Mt. San Antonio Community College and Ms. Kathy Brindell, Chaffey College, who were newly appointed deans in our own community. Both expressed concerns about their new role as dean.

I met with Dr. Gerald Cresi and Mr. Dan Estrada from the chancellors office in Sacramento to discuss therole of dean of occupational/vocational education in the California Community College.

I suggested the possibility of a manual of standard operating procedures (SOP) for the position of dean of occupational/vocational education. The general consensus was that there was a need for such a study and that such a manual would be most helpful to the new administrator.

The decision to pursue a study of the job responsibilities of _the California Community College Dean of Occupational/vocational education was made. This was a more realistic research project for the degree that could be completed. The development of an SOP manual would be too involved requiring more time than I had available. However, the question of a SOP manual would possibly be covered in the questionnaire sent to college deans of occupational/vocational education.

I was not aware that I should have contacted the Sabbatical Leave Committee for approval before making the change in my research project. Had I reviewedmy contract agreement closely, this would have been done. I did, however communicate with personal letters to the chairman and to a member of the committee from my department including numerous post cards while enroute.

Many hours were spent at the following libraries; University of Cclifornia, Los Angeles (UCLA), University of Southern California (USC), California State University Fullerton (CSUF), and California State Plytechnic University, Pomona (Cal Poly), conducting valuable research. Much time was devoted to the Review of Literature, developing a questionnaire, and conducting interviews with local Deans fromthe following community colleges; Cerritos College, Chaffey College, Fullerton College, Los Angeles Trade-Technical Colelge, Orange Coast College, and Rio Hondo College. Test interviews were made using the enclosed questionnaire (see appendix-C). Three ERIC searches were conducted in support of the MARP (see appendix D). So much material was accumulated that it has become difficult to reduce it to a narrow base for more practical use.

The introduction, Review of Literature, and Bibliography, are complete in the rough. A sample is shown in Appendix-D. The questionnaire needs to be formerlly printed and mailed. Upon receipt of the completed questionnaires, they can be tabulated, recorded, analyzed and the data can then be published. Once this is complete, the major findings can be established, conclusions can be determined and possible valid recommendations can be made. There is still much work to be done and I am now trying to bring the MARP into the final stages for completion.

B-COMMUNITY COLLEGE VISITATIONS

According to plan, it was decided to use the spring semester and the warmer weather for community college visitations throughout the United States. Visitations to community colleges throughout California occurred at various times during the fall semsester.

An itinerary was developed for those community colleges that I visited outside of California. A letter of introduction was sent during the fall semester to 40 community colleges throughout the United States requesting a contact person and a phone number, etc. The letter was sent to the Dean, Occupational/Vocational Education or to the Dean of Instruction. Of the 40 letters sent, only nine responses were received. Two of those responding indicated it would not be worth my time to visit their college because their programs were not as advanced as desired. Of the two, one suggested that I visit the state university. Only one of the nine colleges listed a contact person for an industrial visit.

The community colleges visited in California are shown in appendix-E, and a map showing their locations and the route taken by automobile are shown in appendix-F. Universities and private schools are shown in appendix-G. Other community colleges visited throughout the United States are listed in appendix-H, and a map is shown of the route taken by automobile throughout the United States in appendix-I. Universites and private schools are shown in appendix-J.

When a contact person was known, I would telephone ahead and make an appointment. Many times I had to drive all night in order to arrive at the college in time for classes to be in session. I would meet with the instructor or Department Chairman and when possible, visit the Dean, Occupational/vocational Education.

I carried with me four complete notebooks used in each of my drafting classes that I teach at Mt. San Antonio College. I used these notebooks to show the extent of our curriculum, lecture materials, student hand-outs, tests, etc. It proved most helpful. In some cases an exchange of ideas and materials occurred. An interview sheet entitled "Visits With College Drafting Teachers" was developed and used. See appendix-K.

Because of the time factor, I had to cut my trip short, and return home. I regret that I was not able to visit schools in Colorado and Utah as I had planned, but there was not enough time. However, I did drive over 14,185 miles.

C-INDUSTRIAL VISITS

Industrial visits were made when time was available and a contact person was known. The following industrial facilities were visited:

1.	Cincinnati Milacron	Los Angeles, CA
2.	Tosco Corporation	Bakersfield, CA
3.	General Electric Company	Charlotte, NC

C-INDUSTRIAL VISITS (Contd.)

4.	Hickory Furniture Company	Hickory NC
5.	Helbing Lipp Ltd.	Vienna, VA
6.	Westinghouse Research Lab	New Staton, PA
7.	Volkswagen of America	Westmoreland, PA
8.	Ford Motor Company Int.	Dearborn, Mich.
9.	Nissan Motor Company Ltd.	Tokyo, Japan

These visitations usually involved one full day. At one point of the trip, I had to wait over the weekend for the plant to open, since I arrived too late on Friday evening, shortly before the plant closed.

Reductions in the work force and shift layoffs made it difficult at times to view the manufacturing or production process and I had hoped to do.

D-TRAVEL OVERSEAS

A trip to Japan was planned. I wanted to visit the Nissan Motor Company and to see Japanese robots in action.

Prior to my departure, I visited the Nissan Motor Co., American Headquarters, to arrange a contact in Japan. I was given the name, address and phone number of a contact person in the Public Relations, International Division in Tokyo.

E-SEMINARS AND CONFERENCES

Seminars and conferences were attended only when the time and funds were available or whenever it would fit into the overall plan. The following seminars or conferences were attended.

1. Society of Mechanical Engineers (SME) computer show, Los Angles, CA.
2. California Association of Vocational Administrators Conference (CAVA) - Ontario, CA.
3. State Department of Education, Industrial Education Department AIDS seminar - Bakersfield, CA.
4. California Industrial Education Association, Annual Conference (CEIA) - Bakersfiled, CA.

REPORT OF COMMUNITY COLLEGE VISITATIONS

A-CALIFORNIA COMMUNITY COLLEGES

Visitation to the community colleges in California occurred during the fall semester. I visited a total of 36 community colleges, 7 universities and 2 private schools. See appendix-E.

I tried to meet with one of the drafting instructors or Department Chairman and Dean, Occupational/Vocational Education whenever possible. The interviews usually took from one to three hours to complete depending on the situation. I provided each with a four page xerox copy of the Mt. San Antonio Community College Drafting Technology Curriculum, with my calling card included. See appendix-N.

I visited the classroom, studied the curriculum, the equipment used by the students that was provided by the college, and asked about the training aids used. I shared my notebook materials with the instructor, and obtained samples of his work, In turn, the instructor would xerox any material he desired from my notebook. An interview sheet was developed and used as often as posible. See appendix-K. I requested a catalogue from each college, and used them to check the drafting curriculum and the depth of the program offerred. The catalog also gave me information on the goals and objectives ofthe college to use in my research apaper (MARP).

I obtained any of the brochures I could. I also obtained a copy of the latest college newspaper for later review. I made comparisons of the drafting room furniture, appearance of the drafting room with that of Mt. San antonio Colleg faciliites.

1. ROBOTICS

No community college I visited in California had a robotics program. Many were interested, but due to the funding situation, only a few were considering the less expensive Heath Company "Hero" robot.

2. COMPUTER-AIDED DRAFTING

The same was true regarding Computer-Aided Drafting (CAD). Most colleges were interested in offering a Computer-Aided Program if funds were available. Only two colleges actually had a program in progress. These colleges were:

a. Laney College 7 computers

b. Sierra College 2 computers

Mission College in Santa Clara had just installed thirteen Apple II's using software from Di Tech Co. This was a local firm and they were having trouble with it when I was there. Mrs. Gail Amato was the Director of the program. They had received a grant of $100,000 from General Motors as part of a retraining program starting with 26 students from General Motors who had been laid off from work.

I was most impressed with the program at Laney College in Oakland. Dr. Irvin Drew, Director of Occupational Education andSpecial Programs, wrote a proposal for the statewide "Investment in People" competition and was rated first in the state among 53 submissions in November 1982,

He received a grant of $272,000 from the state along with the Bauch & Lomb Corporation matching this amount to provide additional computer hardware and software programming. This made the joint-venture project worth over $550,000.

The funds were used to purchase 7 Hewlett Packard CAD packages. It was a beautiful arrangement with the seven computer consoles set in a large 'U'. The instructor was located in the middle of the 'U'. A separate room housed the two printers.

A smaller portion of the grant will fund three computer-aided manufacturing (CAM) lathes for a machine shop.

The funds were awarded to provide training for 200 students in 6, 12, and 18 week cycles. The students were part of a retraining program for displaced workers from plant closures in Alameda County and the General Motors plant in Fremont.

The program was in full operation from 8 A.M. to 9:30 P.M. Monday thru Friday, and on Saturday 9:00 A.M. to 4:00 P.M.

I was most impressed with what I had seen and the enthusiasm of the faculty and students was quite noticeable.

Not to be outdone, our own Mt. San Antonio College Drafting & Design Department was involved in a consortium with seven other community colleges in Southern California to develop and implement a Computer-Aided Drafting system.

These colleges were:

a.	Cerritos College	Norwalk
b.	Compton College	Compton
c.	Fullerton College	Fullerton
d.	L.A. Pierce College	Woodland Hills
e.	Mt. San Antonio College	Walnut
f.	Rio Hondo College	Whittier
g.	Santa Ana College	Santa Ana

Of the seven colleges, Cerritos College, Compton College, Fullerton College, and Mt. San Antonio College started their CAD programs early with full enrollment in the spring semester. All seven colleges used Apple II computers.

Five of the colleges used Cascade software. Rio Hondo College and Santa Ana College used Cad-Apple software. Most of the colleges had 10 computers, except Pierce College had only one, Mt. San Antonio College had six and Santa Ana College had the most computers - 20.

3. CURRICULUM

Most of the community colleges that I visited in California, had curriculums which were very similar. They varied when conditions or needs in the community warranted. For example, Sierra College in Rocklin offered cartography and photogrammetry for mapping because of the forestry industry and the state government needs for such work. In the Silicon Valley, near San Francisco and San Jose, San Mateo College offered in depth courses in electronic drafting. In the southern Los Angeles basin, Cerritos College, Mt. San Antonio College, Pasadena City College and Rio Hondo College offer piping classes, because ofthe need for draftsmen in the petrochemical field.

The basic and advanced programs in Architecture and in Technical Drawing were common throughout my visits. Programs varied because on the quality and drive of some of the instructors. As teachers, we generally teach as we are taught. I found some dynamic instructors with low enrollments teaching a variety of courses more or less on a one to one basis in one drafting room. Then there were some colleges with a large staff, large enrollment, four drafting rooms who showed littre enthusiasm or drive. They had been

teaching the same way for years and the program and appearance of the facilities reflected the feeling.

I collected materials from different instructors such as student information and instruction sheets, and lecture notes for possible use in my own program. I also took some pictures or made notes of student work or displays that I thought would be beneficial for future use.

I found this to be a most informative experience to be able to visit college instructors from such a variety of locations and educational backgrounds.

4. FACILITIES AND EQUIPMENT

Each college I visited throughout California was deeply concerned about finances and how they were going to maintain their status quo. No one forsaw any growth. They were striving to keep what they had

Some of the older community colleges were using drafting tables and drafting machines that were quite old and gave the whole room the appearance of being run down. Then there were many with new equipment, drafting consoles, track drafters for technical drawing and parallel rules for architecture drawing. Even older schools like our neighbor Rio Hondo College was better equipped than the Mt. San Antonio College drafting rooms.

B-CALIFORNIA UNIVERSITY AND PRIVATE SCHOOL VISITATIONS

1. UNIVERSITIES

Seven universities were visited during the fall semester. See appendix-G. Of these, the University of California at Berkeley, San Francisco State University and Stanford

University were most interesting, because these were new to me. Our universities in the south; California State University Fullerton, University of California Los Angeles, California Polytechnic State University Pomona and the University of Southern California are somewhat familiar to me.

I was most impressed with the size of the northern universities, of their beautiful campus groundsand the architectural design of the buildings. I also learned at first hand the difficulty of parking because of thelarge number of students on campus.

The engineering and architectural departments offered very few drafting classes. Most work was performed in a laboratory or formal classroom lectures. There was very little comparison because of the different missions between the community college and the university.

2. PRIVATE SCHOOLS

I was unable to locate the MPD schools while in San Francisco. I had misplaced their address and they were not listed in the telephone book. When I inquired at another school in the area, they had not heard of them. I did visit the Wimerding Technical High School in San Francisco. The students seemed to be a select group of high achievers, similar to those here in the south such as Don Bosco Technical Institute in Rosemead. There were two drafting rooms well equipped with track drafters. The curriculum for drafting was well balanced; Drafting I & II, Engineering Design I & II, and architecture. The enrollment was 350 students. The condition of the school and the facilities were very good. There was not destruction as you would find in our public schools.

The Bay View Technical Institute in Santa Clara was a very large private school. The students were of college age, but from a lower economic status it seemed to me. The Drafting Department had four very large drafting rooms, well attended. The text used were manuals written by the instructors. The program in both technical and architectural drafting was quite broad in scope. I was shown around the area. They would not give me any of the drawing sheets or other student handouts. I felt that they were pleased that I stopped by for a visit, but they seemed very protective in

what was shown or discussed. I enjoyed the visit very much though.

REPORT OF COMMUNITY COLLEGES VISITATIONS THROUGHOUT THE UNITED STATES

A - COMMUNITY COLLEGES VISITED THROUGHOUT THE UNITED STATES

Visitations to community colleges throughout the United States occurred during the spring semester to take advantage of better weather conditions. I visited 39 community colleges, 15 universities, and 6 private schools. See appendix-H.

A letter of introduction had been sent to 40 community colleges. There were only 9 responses received, but I decided to visit as many community colleges as I could. I would telephone ahead the day before to make an appointment for the following day and plan my driving to be there at the appointed time. Sometimes I would drive all night to arrive in time the next morning for classes to be in session.

As I had done in California visitations, while meeting with each instructor, I would give them each a four page xerox copy of the Mt. San Antonio Community College Drafting Technology curriculum with my calling card included. See appendix-N.

Instructors were glad and somewhat surprised to meet an instructor from California on sabbatical leave. In my eight years at Mt. San Antonio College I have yet to have another instructor visit me, even those from the local Southern California area. If possible I was given a tour of the

department. I was asked about the salary schedule, climate and working conditions, etc. Since California has always been a leader in education, there was great interest in what we were doing, or what we were planning to do. Many were impressed that we had a computer aided design program (CAD) in progress. I only hope that I left a reputable impression on those I spoke with.

I was shocked to learn that the salaries for instructors started at a low of $12,000 and rose to a top salary of $22,000 to $25,000 in most colleges in Georgia, Florida, Texas, and North Carolina. In Detroit and around Washington, D.C. salaries are somewhat higher. The low salaries paid would have a great deal of effect on the quality of teachers in the drafting & design technology programs. Usually, only dedicated people would enter the field since salaries in industry throughout the states were higher than those paid to college instructors.

Tuition was another topic of discussion. Some instructors were surprised to learn that we did not charge a tuition fee. I found a wide range of tuition fees. In Tennessee students paid a fee of $13.00 per unit. The top was $34.00 per unit paid by students in Pennsylvania. These were fees quoted for residents of the local community or county. If you lived outside the local community or county the fees were much higher. For example: Tennessee $51.00 per unit, Pennsylvania $96.00 per unit. Of course, as you might expect, Alaska was the highest with a fee of $205.00 per unit for residents and $595.00 per unit for non-residents.

Tuition paid by students will have a drastic effect on the number of students enrolled at the college or in technical programs. This may have accounted for some of the small number of students attending drafting classes. Seldom did I see the numbers of students total we have in our own drafting classes at Mt. San Antonio College.

An invitation was extended to my host at each college to visit with me if they came to California, and I would be glad to return their hospitality.

I obtained a catalogue from each community college that I visited along the way. I also obtained as many student handouts as I could and picked up a current student newspaper.

1. ROBOTICS

Robots are not new. They have been around for 15 to 20 years, but it was not until about five years ago that robots became cost effective and functional for use in industry. The development in the sixties of the microprocessor, a computer so small that it fits into a silicon chip smaller than a paper clip, helped along the robots development. Compact in size and relatively economical, the chip was well suited to be the "brains" of the robot. And, so began an increase in the robot population, and the increased use of robots in the work force.[1]

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[1]Gail M. Martin, Industrial Robots Join the Work Force, Occupational Outlook Quarterly, Fall '82, pp. 2-11.

And now educators must meet the challenge and prepare students for this new technology. Many of the colleges that I visited were aware of the need for a robotics program, but only four had a program in actual operation. These Community Colleges are:

a. Gulf Coast Community College, Panama City, Fla.

b. Macomb Community College, Warren, Michigan

c. Texas A & M University, College Station, Texas

d. Henry Ford, Dearborn, Michigan

Macomb Community College, near the automotive capital of Dearborn, Michigan, has had a robotics program for three years. With grants from the automotive industry, they have an industrial SECO robot and a Unimate copper welding robot. I did not meet the instructor, Mr. Larry Ford, who was in charge of the robotics program, but was told that they have been retraining those who have lost their jobs in the automotive industry.

Gulf Coast Community College in Panama City, Florida has a Heathkit "Hero" robot and a Genesis P-101 hydraulic robot. The program is well established. Students spend hree hours per week in the laboratory, gaining hands on experience in programming the probot and conducting various operations.

Texas A & M University has a robotics program in the Industrial Engineering Degree Program. They have a Unimate robot and a Puma Robot. These are large industrial robots for demonstration, but not hands on experience for students.

I had the feeling that the instructors themselves were just getting familiar with the robots themselves. Of course this is at the university level, dealing mainly in theory and application.

Henry Ford Community College has developed an automation and robots program. They use the Numatrol for the automation protion of the program. A Cincinnati Milacron robot is used for one class of 16 students. Mr. John Pelong is in charge of the program. Plans are under way to increase the number of robotic classes.

In talking to the instructors at Rice University in Houston, Texas, and Southern Methodist University, Dallas, Texas, robots have been ordered and classes were being prepared for the summer program. I was told that Indiana University would host a robots seminar for other college and university instructors that were interested this summer. Also Ohio State University with a Ford Motor Company grant will retrain 80 displaced Ford workers with instruction for 30 hrs/week for 10 weeks.

2. COMPUTER - AIDED DRAFTING

Today with the wide-spread use of theintegraded circuit chip in electronics it is revolutionizing the way we work and plan. Many of these technological changes are affecting many careers. Retraining people and upgrading job skills is now a necessity in many areas. Drafting is in the

forefront of these changes. Computer-Aided Drafting (CAD) is fast becoming a very familiar term. Any drafter who wants to upgrade job skills must understand CAD and how it affects his or her career. Drafters do not normally have to know how to program, but must understand how to use prepared programs (software) to assist in creating drawings.[2]

Community colleges throughout the United States are gearing up to prepare their students to upgrade their skills with CAD. California, as always, has been one of the leaders.

Most community colleges I visited indicated a desire to incorporate a CAD program into their DraftingTechnology curriculum. Many were actually writing proposals to purchase equipment.

I was most impressed with the community colleges in Texas and in Florida. They were getting strong support from their State Boards of Education. Many schools were ordering the more expensive computers than the Apple Computers that we are using.

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[2]Donald D. Voisinet, Introduction to Computer-Aided Drafting, Mc Graw Hill, 1983, p. 1.

Only a few community colleges actually had a CAD program in service with a functioning curriculum and students enrolled in the program. The following community colleges had such a CAD program, they are; (including one university)

a. Macomb Community College, Warren, Mich.

b. Gulf Coast Community College, Panama City, Fla.

c. Mid-Florida Technical Institute, Orlando, Fla.

d. Walters State College, Morristown, Tenn.

e. St. Paul Area Technical Vocational Institute, St. Paul, Minn.

f. Texas A & M University, College Station, Texas

MACOMB COMMUNITY COLLEGE

Macomb Community College in Warren, Michigan had the most impressive program. The CAD lab was a large room with 10 Applicon PDP-11 computers. Three hundred students were enrolled. The lab was open from 8 A.M. to 2 P.M. Monday through Saturday, and on Sunday from 9 A.M. to 5 P.M. Instructors were on duty to operate the lab. In addition to the CAD system, they had a Computer Integrated Manufacturing system (CIM) which they considered quite good.

MID-FLORIDA TECHNICAL INSTITUTE

Mid-Florida Technical Institute had a CAD program that is just beginning. They have 10 Hewlett Packard computers. They are located in one large unattractive room that was a store room. They spent $115,000 on the system.

GULF COAST COMMUNITY COLLEGE

Gulf Coast Community College in Panama City, Fla. had two CAD Hewlett Packard HP 100 systems for the Drafting Technology Program and 20 Zenith terminals for the electronics Technology Program "Basic Programming for Technology". With only two terminals in the CAD program, instruction is at a minimum, but when you consider each station cost between $40,000 and $50,000 it is a good start. I was most impressed with what I saw. They made two floppy disks of their program for me to bring back and show our department staff.

WALTER STATE COLLEGE

Walter State College in Morristown, Tennessee, has an enrollment of only 4,000, but they had two Brunning Cad terminals and a program that was just starting. They are trying to work a joint venture with the new Nissan automobile plant in Nashville.

ST. PAUL AREA TECHNICAL VOCATIONAL INSTITUTE

The St. Paul Area Technical Vocational Institute in St. Paul, Minn., has a computer design program using three Computervision computers. These computers are a contribution from Computervision Corporation in Woburn, Massachusetts. It is a complete industrial size system worth almost one million dollars. Two more computers have been ordered for the fall semester.

TEXAS A & M UNIVERSITY

Four years ago I visited Texas A & M University when they had first started their CAD program. It was a mixture of components such as a Heathkit printer, a North Star microcomputer which was on loan from the Texas Engineering Experiment Station, a Hiplot pen plotter, a Hipad digitizer board, and a ADM - 3A Alphanumeric terminal. The software was written by the Freshmen Engineering Design students and named Creator. There have been some big changes since my last visit.

Today they have 20 terminals using the Digital 1140 computer and a Complot D98 printer. While I was there, they were using a system that had a keyboard set up as a typewriter. It could use Fortran or Data Base II. It has the advantage of a dual density double sided disk. They were planning to expand the system to 100 terminals so the engineering students could all get hands on experience.

3. CURRICULUM

I was surprised to learn of some of the colleges with so few classes offered in Drafting Technology. This was possibly due to low enrollment and limited funding. Some of the colleges had only one or two instructors and one drafting room. The success of many programs depend upon the quality and commitment of the teacher. One such example was that of Mr. Donald Morgan. Donald taught at a small college in

Mississippi, the Mississippi Gulf Coast Junior College at Jefferson Davis Campus, one of fourteen community colleges in Mississippi. He was the only instructor and had one small room with 20 drafting tables. Yet, he managed to teach piping, sheetmetal and electrical drafting as one class, and map topographic drafting as another. He taught the fundamental classes as well as the technical and architectural classes. His classes were small and were taught in small groups. Students lived in dorms on the campus. Total enrollment was only 3,120, of this number, only 487 were enrolled in the technical areas. Donald was also advisor for the Vocational Industrial Clubs of America (VICA). His students had received many awards. Last year, one of his students won first place in national competition and will represent the United States in international competition in Europe next year.

MIAMI - DADE COMMUNITY COLLEGE

Many of the larger community colleges were actually college districts with satellite campuses in different locations. One of these was Miami - Dade Community College in Miami, Florida.

I visited the north campus, one of four campuses located in the Opa-Locka area of Dade County, on a 2.5 acre site that was part of a World War II Naval Air Station. This is one of 28 community colleges in the state of Florida. The combined

enrollment was over 60,000 students, with 16,000 enrolled in the technical areas. The north campus housed many of the technical classes. There were six drafting rooms with a large selection of courses. The architecture program was predominant. Most of the displays, etc., were from the architectural department. I was disappointed to see the lack of engineering technology displays. Both architectural and Engineering Technology Drafting students receive an A.S. degree. See appendix-L.

I met with Dr. Frederick Baldwin, Associate Dean, who took me through the technical areas. I was introduced to Mr. Bob Moore, architecture instructor, and Mr. David Gondry, technical drawing instructor. I was told that the college was going through some difficult times acquiring funding for new programs since Dr. George Mehallis, former Dean/Occupational Education, had left.

BROWARD COMMUNITY COLLEGE

Another large community college also located in Florida, was Broward Community College in Ft. Lauderdale. There are three campuses; central, north and south. An administrative center is located in town. I visited the central campus, one of the three campuses where most of the technical classes are held.

The combined enrollment is 50,000 with some 20,000 enrolled in the technical areas. I met with Dr. Sam Oppenheimer, Division Dean, Engineering Technology. He sowed me around the college and introduced me to the members of the staff. Dr. Oppenheimer is a Nova graduate.

Four, well equipped drafting rooms were used for both architectural and technical drawing classes. Graduates of the Architectural Program receive an A.A. degree and Architectural Technology students receive an A.S. degree. The program in technical drawing is somewhat limited in comparison to Miami-Dade Community College. See appendix-L.

HOUSTON COMMUNITY COLLEGE

Houston Community College is unique in itself. It is one of 59 community colleges in Texas. The college has 31 separate instructional locationsaround the Houston area. There is no central campus as one imagines, but smaller units located in commercial buildings, closed schools, etc. I first went to the administration building to locate the Drafting Technology Department and was given a map and directions to the Technical Center. Even so, it was difficult to find.

The enrollment exceeds 40,000 students and approximately 11,000 were enrolled in technical courses. I met with Mr. William Sewell, Engineering Program Coordinator, and Mr. Larry Brillhart, Supervisor, Technical Division. Mr. Sewell showed me the facilities and explained the program. He was interested in developing a CAD program and Mr. Brillhart was involved in planning a robotics program for the fall semester. Both were interested in receiving information on other programs being presented in other parts of the country. The four large drafting rooms were well-equiped, but office space for the instructors was small and crowded. See appendix-L.

I returned to the administrative building for an appointment with Mrs. Kathrine Tyra, Director, Resource Development. She has a real estate background. Kathrine was responsible for acquiring a five story commercial building; a five million dollar donation, to the district. This resulted in a big tax break for the owner. She discussed the advantages of working with the private sector in acquiring donations of property, supplies and equipment for the community college. Upon my return, I shared this information with Mr. Dick Wright, Dean, Occupational Education at Mt. San Antonio College.

NORTHERN VIRGINIA COMMUNITY COLLEGE

Nothern Virginia Community College, one of the state's 23 community colleges, is a multi campus, consisting of five campuses conveniently located throughout northern Virginia. They are:

1. Alexandria Campus
2. Annandale Campus
3. Loudon Campus
4. Manassas Campus
5. Woodbridge Campus

The total enrollment was 34,000 with a technical enrollment of over 7,000 students.

I visited the Annandale Campus, and met with Dr. Josef Horowitz, Chairman, Engineering Technology Division. Although he was quite busy at the time of my arrival, he gave me a short tour of the facilities. Neither drafting instructor was available to talk to me. I was surprised to find the drafting program so small. There were only two drafting rooms. The curriculum offered was generally basic for both architecture

and technical. An engineering drafting certificate was awarded after one academic year of study in Technical Drafting or Architecture. The student was then encouraged to transfer into the A.S. degree program or seek employment as an Architectural Draftsman, Engineering Draftsman or Engineering Aide. See appendix-L.

MACOMB COMMUNITY COLLEGE

Macomb Community College located in Warren, Michigan was one of the most dynamic community colleges I had the good fortune to visit. It has two campuses; the center campus located at Mt. Clemens, and the south campus at Warren, Michigan. I visited the south campus. The total enrollment is over 28,400 with a technical enrollment of 13,500 students.

I met with Dr. Edward Lynch, Dean, Technical Education, and Dr. William Allen, Assistant Dean. Dr. Allen had first accepted the position at Macomb Community College after leaving Miami-Dade Community College. It was his first day at the college andDr. Lynch gave us both an excellent tour of the facilities. I was surprised to learn from Dr. Allen, that instructors in the vocational/technical areas received a better salary than the administrators do although not too much more. It was the policy to keep good, well qualified teachers in the calssroom. He said the top salary was over $30,000 which is the highest I've known in my travels except in Alaska.

As previously noted, Macomb Community College was the national leader in developing a computer-aided drafting (CAD)

program by having had such a program for the past three yea rs. CAD is an integral part of such programs as Architectural Drafting, Auto Body Design and Upecial Machine Tool Design. There are over 50 drafting classes offered.

The college is known for its variety of in depth programs, most of which are geared to the automotive industry. It also has four apprenticeship programs; one of which is the Manufacturing Craft Apprenticeship Program. This offers twenty areas of apprentice instruction, some of which are: Draftsman - Design, Die Design, Engineering Design, Machinist, and Tool Makes/Jig and Fixture.

The instructional staff appeared to be made up of a good number of "old timers". Many have over 20 years experience in their field of expertise. There are 14 instructors in Design Technology and 22 instructors in Mechanical Technology. There are 6 well equipped drafting rooms used in the program.

I was most impressed with the attitude, the entusiasm and pride shown by the staff that I was introduced to. Maybe it was because the "Boss" made the introductions, but I had a very positive feeling about Macomb Community College. The visit is a must for others who may wish to visit one of the top vocational colleges.

HENRY FORD COMMUNITY COLLEGE

Henry Ford Community College is oneof 34 community colleges in the state of Michigan. It is a multi campus located in Dearborn, Michigan, the automotive capitol of the nation.

There are three campuses:

1. Main Campus
2. Dearborn Heights Center
3. Miller Searle Center

I had heard much about Henry Ford Community College and was anxious to visit the college. I met with Mr. John Nagohosian, Director Industrial Technology. He explained the curriculum and showed me the technical facilities, appendix L.

There are 17,000 students enrolled at the college, of which 6,000 students are enrolled in the technical program. It was a surprise to me that Henry Ford Community College did not offer a larger selection of technical classes than it did. Two programs, Architectural Construction Technology and Industrial Drafting Technology are offered. Each covered the basic material with advanced courses geared to the needs of the automotive industry. I was somewhat disappointed in the size of some of the shop classes. I felt they were too small and crowded for the subjects being taught. Three drafting rooms were available in support of the technical drawing programs. The college itself was very attractive, but I was somewhat disappointed with what I saw.

ST. PAUL AREA TECHNICAL VOCATIONAL INSTITUTE

A five story building, constructed on 22 acres of land houses the St. Paul Area Technical Vocational Institute in St. Paul, Minnesota. The day enrollment is 3,500 students. There are 2,000 students enrolled in the technical areas. The adult vocational extension program has an enrollment of approximately 22,000 a year.

Mr. George Richter, Technical Division Manager, discussed the curriculum with me and directed me on a tour of the technical areas. There were four well-equipped drafting rooms. Five programs are offered: two of these programs are Technical And Trade and Industrial Programs.

Under Technical Programs are two programs I visited:

1. Design Technology
2. Construction Technology

Each program requires 18 months of study to complete to receive an A.S. degree.

The Design Technology Program is similar to Industrial Drawing. It requires the basic and advanced drafting programs generally taught at most community colleges. Two certificate programs are also offered:

1. Detail Drafter
2. Design Technician

The Construction Technology Program is similar to general architecture classes taught at most community colleges. One aspect is a multiple housing project which is designed by teams of four students each. There are no certificate programs in Construction Technology. See appendix L.

There is a Vocational Industrial Clubs of America (VICA) Chapter at St. PaulArea Technical Vocational Institute. Of the 33 Minnesota Area Technical Institutes competing in the state VICA competition, St. Paul took eight gold medals and will represent Minnesota in national competition.
One of their students in the design technology program won a gold medal in technical drawing and will represent the state in Louisville, Kentucky at the national competition.

NORFOLK STATE UNIVERSITY

The third largest black institution in higher education is Norfolk State University, Norfolk, Virginia. It was known as Norfolk State College until 1980, when the name was changed to Norfolk State University.

I sent a letter to the Norfolk State College requesting a contact person, but received no reply. Upon my arrival, I was surprised to learn that the college name had been changed to Norfolk State University. It is a large university for that area of the country, with an enrollment of 7,000 students. Only 550 students are enrolled in technical classes. The university is located on 50 acres of land.

I met with Dr. George Foster, Assistant Dean, School of Technology. Since neither of the two drafting instructors were available, Dr. Foster conducted me on a short tour of the drafting facilities. There are only two drafting rooms equipped with drafting machines. One room is used for architectural drafting and the other for technical drawing.

The School of Technology is comprised of two departments.

1 - Department of Industrial Arts/Industrial Education

2 - Department of Technology

Though the Department of Industrial Arts/Industrial Education a student may earn a Bachelor of Science degree in either Industrial Arts or Industrial Education. The Department of Technology offers the student a Bachelor of Science degree in

Building Construction, Design Technology or Electronics Technology. An Associate in Science degree is offered in Architectural Drafting and Electrical Technology

WESTMORELAND COUNTY COMMUNITY COLLEGE

Typical of many of the smaller community colleges I visited, was Westmoreland County Community College, Youngtown, Pennsylvania. A college that was serving the needs of this rural Pennsylvania community, one of 14 community colleges in Pennsylvaia. The college is in a Westinghouse plant that has been completely renovated. It is small, but an attractive campus. There are 3,000 students registered for day classes and more than 5,000 in the Continuing Education Division.

Mr. Thomas Bell, Coordinator, Training Center, discussed the curriculum with me. I learned that the Drafting and Design Technology Department offers only 13 classes in its program. Neither of the two instructors were on campus at the time of my visit. Both instructors teach in the technical area. No architectural drafting is provided which to me was quite unusual. Mr. Bell said that as the enrollment increases, they will probably add architecture to the curriculum. Upon graduation, students receive an Associate of Applied Science Degree. (AAS), Appendix-L.

I was shown around the technical areas and visited the two drafting rooms. They were well equipped. Although the general appearance of the campus was very good, I was surprised to learn it was over 11 years old. It appeared to be fairly new.

After our meeting and discussions, Mr. Bell arranged a visit for me to the Westinghouse Research Laboratory. I was pleased to learn that the Laboratory would be testing 16 different robots. My visit to Westmoreland Community College was a very pleasant one. I was most impressed with what I had seen.

ANCHORAGE COMMUNITY COLLEGE

The Anchorage Community College has as its theme "The community is our Campus". Anchorage Community College is one of six community colleges in Alaska. It has an enrollment of 9,000 students, with 3,500 in the technical program. An Associate of Applied Science degree (AAS), is offered in Architectural and Engineering Drafting Technology. Certificates are offered in Architectural, Civil Engineering, Mechanical, Electrical, and Structural Drafting. See appendix-L.

I met with Mrs. Ruby Frankfourth, one of the two instructors on the staff. She is a licensed Architect (AIA), enjoys her work and loves living in Alaska. She was a most interesting person to talk to. I was given a tour of the facilities and the curriculum. It was noted that due to land development, and building in Anchorage, all drafting courses covered different aspects of the building industry. Two well equipped drafting rooms were in use. The campus buildings were designed for much indoor use because of the cold weather. It might be noted that the average teacher's salary was close to $50,000 - but the cost of living balances out this high salary.

4 - FACILITIES AND EQUIPMENT

In my visits to community colleges throughout the United States, I found most colleges were well equipped. Although the school boards did not pay their teachers well, they did spend a lot of money in support of programs. Invariably, I found drafting rooms in technical drawing programs using track drafters or drafting consoles. In rooms where architectural drafting programs are held, parallel rules were used. Only on a few occassions, in Georgia andNorth Carolina, did I see drafting tables and drafting machines such as are used in the program at Mt. San Antonio College.

Supplies and equipment supplied by the college were held to a minimum. As in California, students purchased their own texts, drafting equipment and any supplies needed. Usually a lab fee was charged for different classes of instruction.

Visual aid materials in advanced areas of instruction were generally made by the instructor. This was necessary due to the financial situation, the nature of the area of instruction or the lack of training aid materials. On one occasion, an instructor had received some training aids that I wanted to purchase, but they came from Germany, and he had no information as to how I might order them.

My view based on what I hadbeen exposed to during my visits around the country, is that the community college system in the United States is well equipped as a whole to do the job of serving the educational needs of the community.

As enrollment increases and there is more financial support, the number of classes and size of the curriculum also increases. Community colleges are a unique system found only in the United States

B - UNIVERSITIES AND PRIVATE SCHOOLS VISITED

1. Universities

My visits to universities throughout the United States were very short since I was concentrating on visiting community colleges. The curriculum offered, the drafting room equipment used and the general content of work did not fit into my plan of visitation. I visited the campus of a university to see the general layout and to observe the beauto of the campus as a whole and to say that "I had been there".

NOVA UNIVERSITY

Being enrolled in the Nova program, I was anxious to see for myself, the university setting located in Ft. nauderdale, Fvorida. I did not know what to expect, because you can be disillusioned by pictures from a catalogue. I was quite pleased, however, to see a small campus with three nice buildings.

I met with Dr. Mortson to review my portfolio and to plan the necessary steps to finish the degree requirements. It was at this point that I found out that I needed two mor practicums to complete - and that the tuition had increased. That made my day and so I continued on my way.

TEXAS A & M UNIVERSITY

I spent some time at Texas A & M University, College Station, Texas, as reported, to investigate the nobotics program and the CAD/CAM program. I visited the drafting rooms to see if there had been much change in thepast years, when I was there last. I found that the Technical Drafting Program had grown. There were six drafting rooms equipped with drafting machines and parallel rules. The classes were well attended. The CAD program is being developed and plans are to include engineering students as well as technical students

RICE UNIVERSITY

I made a short visit to Rice University in Houston, Texas. I visited the Ryon Engineering Laboratory and met with Dr. George Brown, Department of Mechanical Engineering. He showed me around the engineering building. There was only one drafting class, 3 hours lecture and 6 hours lab. It was a basic drafting class. He introduced me to Dr. John Cheathman who will be starting a robotics program in the fall semester.

TOKYO KOGYO UNIVERSITY

Tokyo Kogyo University was founded in 1869. It is the oldest university in the country. Yet has a beauty and charm all of its own. You enter the main gate, along a street lined with old trees. I walked to the administration building to obtain some information. Everything was in Japanese. I tried to make my desires known, but to no avail.

Although the Japanese study English as a required subject in their schools, they can not converse very well if at all. However, they can read English. A young Australian, Dr. Curtis Worthington, came to my rescue. Dr. Worthington was hired by the Japanese to teach chemistry for one year. He spoke Japanese fluently. I was told that the university today is for graduate students in advanced studies. That was the reason for the campus not being as crowded as I had expected it to be. Students were moving about quietly in the rain from buildings to each side of the administration.

I was invited to come to the classroom with him. We visited until the students arrived for his lecture and then I departed. Following his instructions, I went to the library, visited two buildings; walked around the campus and then left.

The building showed their age, some in need of repair. The lecture rooms were rather bare and the furniture old. The library was very attractive and only a few students were there. I left my calling card for the librarian who spoke a few words of English. The campus grounds were beautiful, even inthe rain, and quite large when you consider that land is at a premium. I picked up some printed materials and what appeared to be a student newspaper - all in Jampanese script. I then departed hoping I could catch the right train back to my hotel in Tokyo. It proved to be quite a day for me.

2 - Private Schools

Two drafting schools were visited which I will report on. I had written to each school for an appointment andneither responded.

PHOENIX INSTITUTE OF TECHNOLOGY

The Phoenix Institute of Technology is located in Phoenix, Arizona. I met with Miss Helen Bishop, one of the architectural instructors, who showed me around with great pride. The school is a complex of three buildings in an industrial-commercial complex. The enrollment is over 1,500 students with approximately 650 students enrolled in the technical area. The school has 12 drafting rooms with excellent lighting, carpeting and furniture. Each room was well equipped for either an architecture class or a technical drawing class. I saw students doing some excellent work. The curriculum offered was very broad, giving students a wide selection to choose from. The attitude of the student body was a positive one. Many student drawings were displayed on the walls in the hallways. I was told that most of the students are placed with firms all over the country before graduation.

Onthe wall by the entrance to the office, were plaques from National VICA in recognition of their support. Tuition was quite high. Students hadto live in apartments because there was no student housing. Most of their students were from out of state orlived some distance from the school. It was a most enjoyable visit.

MARYLAND DRAFTING SCHOOL

The Maryland Drafting School in Langley Park, Maryland. It is located in a building occupied by the telephone company on the basement floor.

It was small and not too well equipped. They were quite protective and did not want to show me around. I did not talk to an instructor, but was shown around by a woman from the office.

I was not impressed by what I saw. However, students were working and the quality of their work was good. The school prints its own text and lesson plans for each drawing. According to the catalog, diplomas are awarded in Engineering, Architectural and Mechanical Drafting Technology.

REPORT OF OTHER VISITS

A - INDUSTRIAL VISITS

I had hoped to visit more industrial facilities, but was fortunate to see as much as I did. On my travels across the United States, you could see the results of the recession, especially around the industrialized sections of the country. Many plants were closed, especially the steel industry in Pittsburgh. It was almost a ghost town. Some of the automotive plants in Detroit were closed, or were operating on one shift.

I will briefly discuss my industiral visits, giving just the highlights where possible.

CINCINNATTI MILACRON COMPANY

Mr. Jerry Cederstrom, Field Sales Engineer, Industrial Robot Division, California Regional Office, Los Angeles, was most helpful. He advised me to visit some of the industries using robots in the United States, and to visit universities that were starting programs in robotics, such as Arizona Smate University, General Electric Company, and the Nissan Motor Company in Japan.

He showed me the robots that the Cincinnati Milacron Company produces for industry such as welding and paint spraying robots, etc. He told me there were over 4,000 robots used in the United States, and about 14,000 in Japan. Some training aids such as films and slides were offered for dass use at a later date. Hr will permit me to make copies of his slide presentation and notes.

TOSCO CORPORATION

The Tosco Corporation is one of the largest and most modern refineries in KeRn County, Bakersfield, California. I visited the refinery with the California Industrial Education Association (CIEA) members.

It was a very interesting tour, showing how various grades of oil and gasoline are refined for the commercial markets. We were shown the complete operation from delivery of the crude oil to the finished refined grades of gasoline.

We were warned to wear old clothes and a hard hat was provided because of the hazardous and dirty work going on. It was indeed a most interesting visit.

GENERAL ELECTRIC COMPANY

My visit to the General Electric Company in Charlotte, North Carolina, wasto see a robot being used to spray paint G.E. Transformers.

I met with Mr. Ed A. Mitchell, Advanced Manufacturing Engineer, Distribution ransformer Department. Two robots are used to spray paint the transformers. I was not permitted to go into the plant, but stayed in the reception

area and talked to Mr. Mitchell. The use of robots in spray painting has not been challenged by the union too much because it is hazardous, dirty work. The robot works continuously without error. I asked for some brochures with the robot at work so I could photograph them and make slides for class presentations. I was told that they did not have any, but that I could write for some later.

HICKORY FUNITURE COMPANY

The Hickory Furniture Company, Hickory, North Carolina, is located in the Carolina Mountains, the furniture capitol of the United States.

I met with Mr. Jack Layio, Business Manager of the company. Mr. Layio started as a young man forty-two years ago as a helper, working on frames. The company specializes in custom furniture, made by hand as they have done for years. The business department has a computer that determines the cost for each piece of furniture, how much material to cut, etc. It takes four weeks for an order to be filled.

Mr Layio took me through the entire plant and explained each operation for me. I was most impressed with the quality of work and the care given each piece of furniture.

HELBING LIPP LTD.

In Vienna, Virginia, I visited the architectural firm of Helbing Lipp, ntd. Architects - Engineers.

I met with Mr. Tom Helbing, one of the partners of the firm, who showed me the facility and some of the designs he

has produced for McDonalds and Burger King (fast food chain stores along the east coast). Beautiful quality work.

They are using the IBM computer for their engineering work and business accounts and plan to purchase a computer for graphics (CAD) work. I showed him our Apple Computer with the cascade software program. Mr. Helbing said the recession hurt his business but he's been able to maintain a fairly good level of work for his employees with the fast food business.

WESTINGHOUS RESEARCH LABORATORY

Mr. Thomas ell, Coordinator of the Westmoreland Community College Training Center arranged for my visit to the Westinghouse Research Laboratory located in New Station, Pennsylvania.

It was raining very hard when I arrived making it difficult to see the turn-off at the Pennsylvania Turnpike, but I found the research lab. I met with the research engineer who's name I've misplaced. He showed me around the laboratory. They were running tests and analysis on German, Japanese and Swedish robots and comparing them to the Westinghouse and other American models. One Westinghouse robot was set up and he demonstrated its functional use to me. T ere were mostly large industrial type robots - 16 in all - under tests.

It was a very interesting tour. I was not able to obtain any literature, but was told I could write for some later.

VOLKSWAGEN OF AMERICA, INC.

I arrived at the Volkswagen of America, Inc. plant at closing time on a Friday and had to wait until Monday when the plant opened again.

Early Monday morning, I called on Mr. Chet Bahn, Manager, Public Relations. I was disappointed to learn that I could not even view the production line. Layoffs and reduced production were the reasons given for cancelling all plant tours.

Mr. Bahn gave me a packet of materials that I could take with me, and photograph for a slide presentation to use in my classes. He pointed out that there were no robots in the Westmoreland plant. Robots are used only in the German plant in Wolfsburg. The Westmoreland plant has more than 6 miles of conveyor lines to produce over 450 cars a day. The plant covers 46 acres of land.

FORD MOTOR COMPANY

I met Mrs. Lillian Bates, Manager, Special Training Programs, Ford Motor Company at the California State Department of Education AIDS seminar. I asked her about the possibility of a tour of the Ford assembly plant. She said she could arrange a visit for me. While enroute one week before my arrival, I sent her a letter giving an estimate of my arrival and

requested a tour if possible.

When I arrived, I telephoned Mrs. Bates and learned that she had been on vacation and could not set up a tour for me. She referred me to the public relations department who provided me with literature, etc. so that I could make slides for a classroom presentation.

I was most disappointed at the turn of events. I spent two days in Detroit and accomplished quite a lot by visiting local community colleges, the Ford Museum, etc.

NISSAN MOTOR COMPANY

I planned to visit the Nissan Motor Company in Tokyo, Japan because it was one of the most advanced automobile manufacturing companies in the world. Prior to leaving the United States, I was told by the Japanese consultant in Los Angeles, that I would be unable to visit the Nissan Plant because they do not have public tours as we do in this country.

I contacted the Nissan Motor Company, American Headquarters and requested the name and telephone number of someone to see when I reached Tokyo, Japan. I must say, it was most difficult to get this information, but after numerous phone calls and persistence, I was given the name of Mr. Equchi.

Upon my arrival in Tokyo, I called Mr. Yukihito Equchi, Manager International Public Relations Division, Nissan Motor Company, Ltd., and set up an appointment later in the week. I was relieved that he spoke such beautiful English because I had such difficulty at times making myself known.

I arrived early, and studied the displays and automobiles in the showroom until Mr. Equchi called for me.

We had a very nice discussion regarding the automotive industry, the use of robotics, the problems of labor vs. robots, but no plant tour. He was hoping to work me in if an official tour was arranged for visiting dignitaries. This did not come about. He did give me some slides, brochures of robots and black and white production pictures.

The interview was most successful and productive for me. I gave him a copy of the best seller "Megatrends", by John Naisbitt. He was most pleased and gave me a beautiful Japanese fan. I was most pleased with the visit.

REPORT OF OTHER VISITS

B -REPORT OF TRAVELS OVERSEAS

My travels overseas to Japan were most interesting. I flew from California to Anchorage Alaska. I spent three days in Anchorage. The weather was poor snowing and cold, making it difficult to get around. It was 19°.

I visited Anchorage Community College the second day of my stay in Alaska. As previously reported, I met with Mrs. Ruby Frankfourth, one of the two architectural engineering instructors at the college. Mr. Lin Bauer was not present at the time, but I was shown the facilities and some of the student displays.

From Alaska, I flew to Okinawa where I spent two days. The contrast was most noticable coming from a cold climate into a warm, humid climate. I rented a car and toured the island. I tried to locate a community college, but was told there was none on the island, only primary and secondary schools, similar to our elementary and secondary schools in _e United States.

From Okinawa I flew to Yokota, Japan. I spent the night there and made arrangements for lodging in Tokoyo the next day.

I spent one week in Tokyo. As soon as I was settled, I phoned Mr. Yukihito Eguchi, manager, International Public Relations, Nissan Motor Company Ltd., and made an appointment later in the week, as previously discussed.

My interview with Mr. Eguchi of _e Nissan Motor Company was in some ways a success, although I was unable to actually see the robots in action as I had wished.

After the interview was over, I planned my visit to Tokyo Kogyo University which I have reported on. The weather was poor and I had difficulty making myself known to the Japanese. I rode the train to the university and the then walked about ten blocks to the reach the main gate. I was disappointed in not being able to visit an engineering draftingclass or something in that field. I left the university and returned to Tokyo.

It was an interesting visit. I found it difficult to find lodging and could not extend my reservation even for a few days. I was surprised how expensive things were and had to watch my funds closely.

When it was time to leave Tokyo, I boarded a train for Yokota. Upon arrival in Yokota, I was able to catch a direct flight to California ending a very pleasant and interesting experience.

C - SEMINARS AND CONFERENCES

Only four functions were attended and only as a spectator so to speak. These functions will be reported on briefly.

SOCIETY OF MECHANICAL ENGINEERS

The Society of Mechanical Engineers (SME) hosted a computer show at the Los Angeles Convention Center. I attended the show for only two days; lectures and displays.

There were many sophisticated computers on display for commercial and industrial use. These were large, very expensive computers which could perform many functions, such as; three dimensional drawings, rotation of objects, color work, etc. These computers were far more complicated than was necessary to meet the needs of community colleges. Only a few companies displayed computers suitable for educational needs.

I attended two lectures which were outstanding. It was interesting to hear the questions raised from the floor, and of the concerns of those in industry. It was an interesting show and I enjoyed it.

CALIFORNIA ASSOCIATION OF VOCATIONAL ADMINISTRATORS

The California Association of Vocational Administrators (CAVA) held their Fall Conference in Ontario, California. I attended the conference mainly to meet some of the Vocational Administrators I would be sending questionnaires to.

In addition to administrators from different community colleges, there were members from the Chancellor's Office. The issues discussed were; State and Federal Funding, Factors in Curriculum Design, Vocational Education and State Policy, The Joint Partnership Act (JTPA), Federal Legislation, and other topics.

STATE DEPARTMENT OF EDUCATION, INDUSTRIAL EDUCATION AIDS SEMINAR

This was a very fine seminar dealing with the changes taking place in our industrial society and the fact that educators that do not adept to these changes will be left behind. The seminar was held in Bakersfield.

There were some excellent speakers; Mr. Gene Bottoms, Executive Director, American Vocational Association, and Mr. James Allison, Chief, California State Department of Education.

Mr. Gerald Kilbert, Administrator, Department of Education explained the Job Training Partnership Act (JTPA), where the federal government deals only with the state governors. The private sector not only has an advisory role but a decision making role as well.

Mr. James Allison, Chief, Industrial Education, California State Department of Education spoke on establishing regional resource centers as part of the AIDS program (action, involvement, development, services). This is an effort to bring all the various groups together.

Industrial Arts, Trade & Industry, and the Apprenticeship programs, to work cooperatively and to cut the lines of communication to be more efficient.

CALIFORNIA INDUSTRIAL EDUCATION ASSOCIATION

The California Industrial Education Association (CIEA) held its annual Conference in Bakersfield, California. The theme of the conference was Quality Education: Sign of the Times. The conference was well attended. There was a wide selection of professional section meetings and many products and services on display in the civic auditorium.

I attended sessions on Drafting/Computer/Electronics "CAD-Printed Circuit Boards" by Mr. Jerry Brown, "Manufacturing Forum" by Mr. Dennis Dirkson, "Robots" by Mr. Tom Grover, and "Geometric Tolerancing" by Mr. George Pruitt. The speakers were excellent and brought some valuable information to the conference. It was a very interesting conference and I felt that I had received a lot of useful information.

SUMMARY

Community Colleges are distinctively American. They are unique because they reflect and in many cases, involve the entire community that they serve. If they are to be effective, their educational programs are responsive to individual needs and sensitive to the local economy.

There are more than 1,000 community colleges in the United States. They are providing affordable, close to home educational opportunities. The open door admissions policy of many community colleges provides a wide variety of students with the opportunity to expand their vocational, cultural and intellectural abilities.

In California, community colleges have a broad foundation serving the needs of thousands of students, young and old. This has been based on community control designed to meet the needs of the local community. With the passage of Proposition '13', we will possibly lose some of this control to the legislature bringing about changes in the way we operate our community colleges.

A travel itinerary is provided in appendix M, showing dates and places visited. Some of my notes have been misplaced and therefore, some of the dates may not be the exact day I arrived, but it is as accurate as I can determine.

Much material was collected during the sabbatical leave such as course outlines, student hand-outs, program brochures and various forms used etc. Only what I considered to be the better example are placed in the report. Others, including

cataloges, student newspapers, etc., will be on file in my office for anyone desiring to see them. Some of these materials will be given to other departments for thier use.

Materials were also collected for Computer Aided Design (CAD) an Robotics for possible curriculum development, see appendix O. NO CAD curriculum was formally developed because the curriculum established and inforce at Mt. San Antonio Community College was of good quality in comparison to what I had seen other schools. Most of the CAD programs I saw were those from commercial vendors with commercially developed packages, too expensive for our limited funds.

I found no Robitcs program adaptable for a drafting class othern than some lecture material and photographs for use in my Elements of Mechanical Design class.

During my visits, I found the usual visual aids for most basic programs, but very few for advanced programs, but very few in advanced programs. I did see some visual aids which I intend to copy for use in my own class. One that I'm copying now is a cylinder cut in half and one section of the cylinder will be mounted in the normal viewing arrangement and a frontal view drawing of the part will be shown above the front. The other part of the cylinder will be mounted on the plexiglass showing the inside protion of the cylinder. Above it will be a sectional view drawing of the part. This will help to visually explain sectioning to students.

Most of the teachers I met were dedicated teachers who enjoyed teaching. Their enthusiasm programs and the condition of their classroom displayed this attitude.

Architecture was predominately listed a separate division with university transfer credit toward a degree in architecture. In many cases, Technical Drawing would be part of the engineering division with university credit towards an engineering degree.

I added to my report those impressions and comments that would reflect what I had seen or done, although they were not necessarily in the original sabbatical proposal. I found, for example, that it was difficult to meet with some instructors if classes would be closed and no instructor would be available to talk with even though I had phoned ahead the day before. It was sometimes difficult judging time and conditions in advance. Meetings with Deans or Department Chairmen was difficult because many times they had scheduled previous committments.

The overall assessment of my sabbatical was excellent. Everywhere I went, though only with a few exceptions, I found out that the Drafting & Design program at Mt. San Antonio College ranked well above the programs I saw. We had more students, a larger staff, a better variety of classes offered and more depth to our programs. I was shocked to learn that Geometric Tolerancing, which we teach, was _ot offered at Stanford or Rice Universities, both engineering scholls. Many community colleges did not offer the program either. This is a must in manufacturing requirements today.

No where did I see a machine shop facility as in our Metals Technology program, or on aircraft and engine repair facility as in our Aircraft and Industrial Technology program. The size, layout and functional use of shop facilites is much better than anything I've seen in my visits to 74 community colleges throughout the United States.

The committment to quality equipment for community college drafting & design technology programs in other states far exceeds that which we receive at Mt. San Antonio Community College. State boards of education provide large sums of money in support of capitol outlay. Most colleges, even in the poorer southern states, were using modern drafting consoles with track drafters.

Almost every community college I visited, outside of California, was gearing up their programs to meet the challenge of the computer in technical education and the use of robotics in the electronics program. Curricular was being developed and equipment was being ordered in support of these programs.

The cost of upgrading a Drafting & Design Program at Mt. San Antonio College is minimal when you consider the large student enrollment maintained year after year, the many students who gain employment upon completion of the program and the quality of our graduates as they are known throughout industry.

The drafting tables and drafting machines in use today are very outdated. Many were brought in from other departments when their enrollments decreased and our Drafting & Design program grew. Once better equipment is received, such as drafting consoles etc., our students can upgrade their skills with the new equipment.

The computer aided design (CAD) program would not have gooton off the ground if it had not been for the foresight and efforts of others outside of the Mt. San Antonio Community College District. Although requests had been made from our department to incorporate such a program, it was only after the efforts of Mr. Richard Whitman, Dean Vocational Education Cerritos College and others that such a program was approved and installed. The program has had marked success and is in need of expanding to accommodate not only growing students needs, but should be incorporated into each drafting & design program requiring students to complete a portion of their drawings in each ciscipline; architecture electronic drafting, mechanical drawing, structural design, technical drawing and technical illustration, etc.,

the Sabbatical Leave Program offered by Mt. San Antonio Community College is of prime importance. It enables instructors the opportunity to improve their own development and professional growth, to undertake advanced studies, visit other colleges andindustries and to travel abroad.

There is a sacrifice for both parties, the college in hiring a substitute for the leave period, and the reduced salary with heavy travel expenses for the instructor.

This sabbatical leave opened my eyes to what is happening in other community colleges throughout the country. It gave me new insights into future demands on our students, and made me realize that we must keep abreast of the changing technologies. The sabbatical was a very enriching experience for me, one that I will well remember and I'm grateful for the opportunity to have participated in the program.

APPENDICIES

APPENDICIES

MT. SAN ANTONIO COLLEGE
Salary and Leaves Committee

APPENDIX A

MT. SAN ANTONIO COLLEGE
1981 NOV 30 PM 4:30
PERSONNEL OFFICE

APPLICATION FOR SABBATICAL LEAVE

Name of Applicant BUSHONG, (Last) HERMAN (First) LESLIE, JR. (Middle)

Address 20550 Seton Hill Drive, (Street) Walnut, Ca. (City) 91789 (Zip)

Employed at Mt. San Antonio College beginning September (Month) 1975 (Year)

Dates of last sabbatical leave:
From None (Month) (Year) To (Month) (Year)

Department _____ Division _____

Length of sabbatical leave requested:

One semester _____
Fall _____ Spring _____
Two semesters X
Administrative _____

Purpose of sabbatical leave:

Study _____
Independent Study or Research _____
Travel _____
Combination (specify) X
RESEARCH & TRAVEL

Effective dates for proposed sabbatical leave:

From September 1982 To June 1983

and (if needed)

From _____ To _____

Attach a comprehensive, written statement of the proposed sabbatical activity(ies) including a description of the nature of the activity(ies), a timeline of the activity(ies), an itinerary, if applicable, the proposed research design and method(s) of investigation, if applicable.

Attach a statement of the anticipated value and benefit of the proposed sabbatical activity(ies) to the applicant, his/her department or service area, and the College.

Any change or modification of the proposed sabbatical activity(ies) as evaluated and approved by the Salary and Leaves Committee must be submitted to the Committee for reconsideration.

Herman L. Bushong Jr. — Signature of Applicant

25 Nov 1981 — Date

4

APPLICATION FOR SABBATICAL LEAVE
Page 2

Applicant's Name HERMAN L. BUSHONG, JR.

The acknowledgment signatures reflect awareness of the sabbatical plan for the purpose of personnel replacement. Comments requested allow for recommendations pertaining to the value of the sabbatical leave plan to the College. Applicants must obtain the signatures of acknowledgment prior to submitting application to the Salary and Leaves Committee.

ACKNOWLEDGMENT BY THE DEPARTMENT/DIVISION

Signature of Department Chairperson Joseph H. Mundorf Date 11/30/81

Comments:

Signature of Division Chairperson T Bruce Ambler Date 11/30/81

Comments:

ACKNOWLEDGMENT BY THE OFFICE OF INSTRUCTION

Signature of Vice President/Asst. Superintendent Instructional & Student Services Joseph M. Zygmont Date 11-30-81

Comments:

****

FINAL ACTION BY THE SALARY AND LEAVES COMMITTEE:

✓ Recommend approval to the Board of Trustees

_____ Not recommend approval to the Board of Trustees

Walter K. Oleinik 6-29-82
Signature - Chairperson, Salary and Leaves Committee Date

Lola D. Rambo 11/29/82
Signature - Authorized Agent for the Board Date

myw
10/13/81

HERMAN L.BUSHONG, JR.

Addandum to Sabbatical Leave Request

In answer to possible concerns of the evaluation committee to the sabbatical leave request submitted, I am presenting the following for clarification.

RESEARCH

My enrollment and studies in the Nova University Ed.D program was approved by the college prior to enrollment in the program. The areas stated in 'A' of the request are the five chapters of the dissertation. It involves a follow-up study of the graduates in the drafting program, a study of the recruitment and retention of drafting majors and the development of a curriculum, possibly in computer graphics.

To my knowledge, nothing of this nature has been accomplished by a member of the Industrial Studies Division. The benefit of my studies to the entire Industrial Studies Division and not only the Drafting & Design Department should prove the worth of the sabbatical. All of my studies have been on Sat . & Sunday at the UCLA, Calif. State Univ. Long Beach, and Calif. Poly. Univ. libraries. With concentrated study and research, who knows what the results of my effort will be?

STATESIDE TRAVEL - CALIFORNIA

Altho I have already visited most of the community colleges in the Calif. area from San Francisco to San Diego, I have not been able to be there during class sessions. I plan to return to select colleges who have outstanding programs. These were not mentioned or identified. Some of the following educational institutions will be visited and their programs studied;

American River College, Los Rios
Bakersfield College, Bakersfield
Monterey Peninsula College, Monterey
Bay-Valley Technical Institute, Santa Clara
Cerritos College, Norwalk
Rio Hondo College, Whittier
Fullerton Jr. College, Fullerton
Golden West Community College, Huntington Beach
Pierce Community College, Woodland Hills
Saddleback College, Capistrano
West Valley Occupational Center, Woodland Hills
San Diego Mesa College, San Diego

STATESIDE TRAVEL

In my travels outside of the state of California, I will visit only those colleges with sufficient enrollment and the course offerings mentioned in'B' and 'C' above; Computer Graphics, Electronic-Schematic Drafting and Elements of Mechanical Design. These three courses are advanced courses that require a higher level of instruction than normally found in most colleges, therefore the final selection will be based upon the questionnaire results. In researching the "Technical Educatic Yearbook of 1980" I find the following colleges to be of interest in meeting the criteria set forth. Additional colleges will be added when the final results are tabulated and a definite route can be planned across the United States and return.

Utah Technical College, Provo, Utah
Henry Ford College,Dearborn, Michagain
Pratt Institute of Technology, Brookland,New York
American Institute of Drafting, Philadephia, Penn.
Maryland Drafting Institute, Langley Park, Maryland
Northern Virginia Community College, Annadale, Va.
Norfolk State College, Norfolk, Va.
Fayetteville Technical Institute, Fayetteville, N.C.

HERMAN L. BUSHONG, JR.
SABBATICAL LEAVE REQUEST

Having taught in the industrial and vocational discipline for 20 years, this is the first opportunity to apply for a sabbatical leave. My plans for a sabbatical leave consist of a combination of formal and independent study, travel, development of teaching materials and attendance at professional conferences and seminars.

A- REASEARCH

Of primary importance is the assimilation, compilation and writing of materials for the Doctor of Education (Ed. D.), specialization in Vocational, Technical and Occupational Education. This covers the areas of Curriculum & Instruction, Personnel, Management Information Systems, Administration, Trends & Issues, and Applied Educational Research to be used in the final dissertation as a major applied research project. I have completed all course work requirements for the degree over the past four years, the outline and some of the writing, but a death in the family and other problems delayed completion of requirements for the degree.

B- ADDITIONAL RESEARCH

As I continue the research for the degree, I will also be compiling materials for two of my classes, Elements of Mechanical Design and Electronic Schematic Drafting, as well as a search into Computer Graphics to determine if such a course can be conducted here at Mt. SAC with our limited resources.

The Elements of Mechanical Design course needs additional research because the text used does not provide sufficient information in the areas of linkage, springs, couplings, etc. Only through the use of professional vocational journals and some technical manuals have I been able to obtain the information desired.

The Electronic Schematics Drafting course has a text that covers the material, however, neither course has an organized audio visual package. I will be compiling materials and locating visual aids for both courses as I conduct my primary research, and visit community colleges and industrial facilities around the country.

Computer Graphics is one area that I have been interested in for some time, but there has not been the time available to study, and make contacts with industry and other colleges that have the program. I definitely plan to do what I can in this vital area.

formally visit.

1- TRAVEL -CALIFORNIA

Altho I have already visited most of the community colleges in the Calif. area from San Francisco to San Diego, I have not been able to be there during class sessions. I plan to return to selected colleges who have outstanding programs. Some of the following educational institutions will be visited and their programs studied;

SCHOOL	ENROLLMENT Total	Technical
1- Allen Hancock College, Santa Maria	10,000 -	6,500
2- American River College, Los Rios	22,434 -	13,897
3- Antelope Valley College, Lancaster	6,500 -	2,860
4- Bakersfield College, Bakersfield	12,875 -	5,968
5- Bay-Valley Technical Institute, Santa Clara	300 -	260
6-Ceritos College, Norwalk	21,426 -	--
7- Chaffey College, Alta Loma	11,644 -	4,500
8- College of San Mateo, San Mateo	16,000 -	3,000
9- Fullerton Jr. College, Fullerton	23,100 -	--
10- Golden West Community College, Huntington Beach	19,000 -	12,635
11- Los Angeles City College, L. A.	20,000 -	11,000
12- Long Beach City College, L.B.	27,148 -	12,488
13- MPD Schools, San Francisco	250 -	250
14- Monterey Peninsula College, Monterey	10,000 -	3,000
15- National Technical Schools, L. A.	1,100 -	1,100
16- Palomar Community College, San Marcos	6,000 -	2,400
17- Pierce Community College, Woodland Hills	22,500 -	5,000
18- Rio Hondo College, Whittier	13,100 -	3,000
19- Saddleback College, Capistrano	19,728 -	11,176
20- San Diego Mesa College, San Diego	9,100 -	1,800
21- Santa Ana College, Santa Ana	24,397 -	9,515
22- Sierra College, Rocklin	9,000 -	4,500
Note- Mt. San Antonio College	23,000 -	14,260

2- TRAVEL - OTHER STATES

In my travels outside of the state of California, I will visit only those colleges with sufficient enrollment and the course offerings mentioned in 'B' and 'C' above; Computer-Aided Design, Electronic Schematics Drafting and Elements of Mechanical Design. These three courses are advanced courses that require a higher level of instruction than normally found in most colleges, therefore, the final selection will be based upon the questionnaire results.

In researching the "Technical Education Yearbook of 1980", I find the following colleges to be of interest in meeting the criteria set forth. Additional educational institutions will be added when the final results are tabulated and a definite route can be planned across the United States and return. Only 37 of the 153 schools as identified in the Yearbook are listed below. All institutions will be contacted.

SCHOOL	ENROLLMENT Total - Techanical
1- Aims Community College, Greely, Colo.	4,649 - 2,212
2- Community College of Denver, North Campus, Westminiser, Colo.	4,415 - 2,530
3- Hartford State Technical College, Hartford, Conn.	1,500 - 1,238
4- Brevard Community College, Cocoa, Fla.	9,804 - 4,652
5- Broward Community College, Ft. Lauderdale, Fla.	17,241 - 4,194
6- Gulf Coast Community College, Panama City, Fla.	3,500 - 1,800
7- Hillsborough Community College, Tampa, Fla.	12,000 - 4,700
8- Miami-Dade Community College, Miami, Fla.	67,650 -14,725
9- Mid-Flordia Institute, Orlando, Fla.	1,185 - 847
10- Augusta Area Technical School, Augusta, Ga.	3,638 - 1,280
11- Parkland College, Champain, Ill.	7,167 - 3,648
12- Wilbur Wright College, Chicago, Ill.	7,900 - 585
13- Indiana Vocational Technical College, Evansville, Ind.	1,128 - 1,128
14- Kirkland Community College, Cedar Rapids, Ind.	2,431 - 1,740
15- Southeastern Lousiana Univ.,Hammond, La.	7,200 - 370
16- Community College of Baltimore, Baltimore, Md.	11,500 - 400
17- Maryland Drafting Institute, Langley Park, Md.	200 - 200
18- Northeast Institute of Industrial Technology, Boston, Mass.	700 - 700
19- Henry Ford College, Dearborn, Mich.	12,000 - 6,000
20- Kirtland Community College, Rosecommon, Mich.	2,000 - 1,200
21- Lansing Community College, Lansing, Mich.	18,313 - 9,324
22- Minneapolis Area Vocational Technical Institute, Minn.	21,500 - 1,400
23- St. Cloud State Univ. College of Industry, St. Cloud Minn.	12,000 - 400
24- St. Paul Vocational Institute, St. Paul, Minn.	3,500 - 2,000
25- Mississippi Gulf Coast Jr. College, Jefferson Davis Campus, Gulfport, Miss.	3,127 - 487
26- Franklin Technical School, Joplin, Missouri	2,400 - 350
27- Pratt Institute of Technology, Brookland, N.Y.	4,200 - 4,200
28- Catwaba Valley Technical Institute, Hickory, N.C.	3,149 - 1,907
29- Fayetteville Technical Institute, Fayetteville,NC.	4,860 - 2,637
30- Northeastern Oklahoma State Univ., Tahlequah, Okla	6,000 - 300

Lenior Furniture Co., Lenior, North Carolina (furniture)
Smithfield Industries, Clarksville, Tenn. (robotics)
Transcon Incorporated, Cleveland, Ohio. (industrial robots)
Pasco Gear & Machine, Inc. Phonex, Ariz. (precision gears)
Suhner Industrial Products Corp., Rome, Ga. (flexible shafts)

D- ANTICIPATED VALUE TO MOUNT SAN ANTONIO COLLEGE

I am excited about the possibilities of such a sabbatical leave. It will enable me the opportunity to accomplish a great deal in such a short period of time. The value to the college and my students, the wealth of information, ideas, and materials, visual aids etc., is outstanding. My research should provide much depth and background of information and knowledge to vastly improve my role as a teacher, as well as, my ability in other areas as a faculty member. Visitations to other colleges and industries will provide me with a broad background few teachers have. I will be able to relate to my students information, techniques, and standards etc., used in other educational institutions and manufacturing facilities in today's society. I will have sufficient visual aids to enhance the two programs I now teach, and will have curriculum developed or information and materials available to better judge the feasibility of a computer-Aided Design program at Mt. SAC.

E- TIMELINE

A timeline cannot be definitely established at this time, however, the general outline of time will be used as a guide.

My primary effort will be concentrated on completing the major research project as specified in 'A' above. This effort will occur in the summer and fall of 1982.

I will travel east at the most suitable time possible, determined by the results of the questionnaire as indicated in 'C' above. Travel throughout California can be accomplished at any time. Once the results of the questionnair have been obtained and a definite timeline is established, I will notify the Sabbatical Leave Committee of all institutions to be visited, the dates and contact persons to meet. I will keep the committee informed as to my progress throughout the United States.

F-PRELIMINARY REVIEW

In reviewing the critique of my Sabbatical Leave Request, dated 25 Nov., I have made the following changes.

1- I have provided the specifics regarding visits to educational institutions by the criteria used in selecting these institutions and the

EXAMPLE #1 COVER LETTER AND QUESTIONNAIRE SAMPLES

The following examples contain my thoughts in designing and developing a questionnaire for the purpose of selecting the educational institutions and industries most desirable to visit. The final form may vary after some preliminary field testing before initiating the formal questionnaire.

#1-A COVER LETTER - EDUCATIONAL INSTITUTIONS

Dear Sir; Spring of 1982

I am on a sabbatical leave from Mt. San Antonio Community College, located in Walnut, California, Los Angeles County . I am interested in the possibility of a visit to your institution during the school year 1982-83. To help me in planning this visit and to insure the maximum benifits of time and effort, would you please respond to the enclosed questionnaire and return as soon as possible in the enclosed, stamped, self addressed envolope.

It is my desire to improve my own program and to enhance the quality of instruction at Mt. San Antonio College. I am interested in the following programs:

A- Computer-Aided Design
B- Electronic Schematic Drafting & Electronic Packaging
C- Elements of Mechanical Design

Your institution has been chosen because of your drafting program and the offerings in one of the three areas above. I would like to spend one OR two days visiting your facility to study your program, exchange ideas, obtain samples of your program, and information of the visual aids you use. I will also bring samples of my own work for you to make zerox copies if you desire. I will have a camera and a tape recorder to photograph and record information, etc. , benificial to my own program at Mt. SAC.

While in the area, I would like to visit one of the major industries that hire your graduates. If it is possible I would like the name, title and phone number of a contact person to make the necessary arrangements.

Upon receipt of the completed questionnaire, a schedule and agenda will be made and you will be contacted to see if it would be convienent for me to call on you.

Thank you for your help and support in this endeavor.

Sincerely,

Herman L. Bushong, Jr.
Instructor
Drafting & Design Dept.

Year_____ Author _____Publisher_____

7- Are you using a workbook? Yes_____ No_____
Title_____Edition_____ Yr_____ Author _____

Publisher_____

8- Do you have audio visual aids for the program? Yes_____ No___
What type? Film Strip or slides _____ , Audio tape_____,

Movie_____, Video Tape_____ Other_____

B- ELECTRONIC SCHEMATIC DRAFTING Yes____ No____

1- What Text are you using? Title_____Edition____
Yr_____ Author_____ Publisher_____

2- Do you use a workbook? Yes____ No_____ Title_____
Edition_____ Yr_____ Author_____Publisher_____

3- What areas of instruction do you cover? Do you have Audio Visual Aids for the program? Please use the following code; FS=Film Strip, T= Tape Recording, M= Movie, VT= Video Tape.

PROGRAM	Yes	VISUAL AIDS Code
a- Block Diagram	____	_____
b-Schematic Diagrams	____	_____
c- Cable Drawings	_____	_____
d- Printed Circuit Boards	___	_____
e- Wiring Diagrams	____	_____
f- Intergrated Circuits	____	_____
g- Flip-Flop Circuits	____	_____
h- Other_____		_____
_____		_____

C-ELEMENTS OF MECHANICAL DESIGN Yes____ No_____

1- What Text do you use? Title_____Edition___ Yr____
Author_____Publisher_____

2- Do you use a workbook? Yes_____ No_____
Title_____Edition_____ Yr_____ Author_____
Publisher_____

3- What areas of instruction do you cover? Do you have Audio Visual Aids for the program? Please use the same code as above.

PROGRAM	Yes	VISUAL AIDS Code
a- Belt Drives	_____	_____
b- Chain Drives	_____	_____
c- Gears	_____	_____
d- Couplings & Flexible Shafts	_____	_____
e- Clutches	_____	_____

#1-C COVER LETTER - INDUSTRIAL FACILITY

Spring 1982

Dear Sir;

I am on a sabbatical leave from Mt. San Antonio Community College, located in Walnut, California, Los Angeles County. I am an instructor in the Drafting & Design Department of the college and teach classes in Technical (Machine) Drafting, Electronic Schematic Drafting, and Elements of Mechanical Design. I am interested in visiting your facility to study the industrial process and techniques used in manufacturing today. I would like to see any automated systems and robotics in use, as well as, the drafting techniques & standards, computer-aided design (graphics), etc., you may be using in your engineering department.

If it is possible for me to visit your facility, please send me the name of a contact person, title and phone number, so that I may plan my trip and make an appointment for a visit.

Thank you for your courtesy and assistance,

Sincerely,

Herman L. Bushong, Jr.
Instructor
Drafting & Design Dept.

NOTE: If the facility has been recommended by one of the schools I have contacted, I will so indicate. When the visit is approved, I will request permission to take photographs, tape conversations etc. for use in the classroom. In addition I will have developed a short questionnaire which I will score during the interview for job entry knowledge and skills required of community college graduates. In addition I will have specific questions regarding the drafting standards used in that industry. This will tell me if I am teaching transfer standards for the student to use in major industries. I will also request drafting samples, literature, visual aids, etc., anything that will help me to tell students what the REAL WORLD is really like.

MT. SAN ANTONIO COLLEGE

1100 NORTH GRAND AVENUE • WALNUT, CALIFORNIA 91789

Telephone: (714) 594-5611

January 29, 1982

Mr. Herman Bushong
Industrial Studies
Campus

Dear Mr. Bushong:

The Salary and Leaves Committee has completed the review and evaluation of sabbatical leave applications for the 1982-83 school year. I am pleased to inform you that the Committee will recommend that the Board of Trustees approve your sabbatical at the February, 1982 Board Meeting. You will subsequently be informed of the Board's action.

As explained in the sabbatical leave orientation meeting and in the published materials developed by the Committee, the evaluation of sabbatical applications was based upon established criteria and thorough review by the Committee.

You are respectfully reminded that, upon granting and acceptance of the sabbatical leave, you are obligated contractually to fulfill your sabbatical plans as approved by the Committee. Any variation from the approved plan must receive prior approval from the Committee. Payment of salary and benefits is contingent upon this agreement.

Congratulations on the success of your application. I hope that your sabbatical will prove to be of mutual benefit to you and the College.

Sincerely,

Walter W. Collins, Chairperson
Salary and Leaves Committee

WWC:dcd

cc: Salary and Leaves Committee

APPENDIX- B

MT. SAN ANTONIO COLLEGE

1100 NORTH GRAND AVENUE • WALNUT, CALIFORNIA 91789

Telephone: (714) 594-5611

Dear Sir:

I will be on a sabbatical leave from Mt. San Antonio College, located in Walnut, California, Los Angeles County. I am interested in the possibility of a visit to your institution during the spring semester. To help me in planning this visit and to insure the maximum benifits of time and effort, would you give me the name and phone number of a contact person that I may phone to set up an appointment as I travel across the United States.

It is my desire to improve my own program and to enhance the quality of instruction at Mt. San Antonio College. I am interested in the following programs:

A- Computer-Aided Design CAD, and Drafting & Design

B- Electronic Schematic Drafting

C- Elements of Mechanical Design

D- Robotics

Your institution has been chosen because of your drafting program. I would like to spend some time visiting your facility to study your program, exchange ideas, obtain samples of your materials, and information of the visual aids you use. I will also bring samples of my own work, a camera and tape recorder to record information etc.

While in the area, I would like to visit one of the major industries that hire your graduates.

Would you provide me with a contact person, etc. and return it in the self addressed envelope provided.

Thank you for your support and help in this endeavor.

I will make contact by phone while enroute and set up an appointment.

Sincerely Yours,

Herman L. Bushong, Jr.

Herman L. Bushong, Jr.
Instructor, Drafting Dept.

PLEASE TEAR OFF AND RETURN IN THE ENCLOSED STAMPED ENVELOPE.

CONTACT PERSON_____

PHONE NUMBER _____ _____
Area Number

Map or instructions to get to your institution if in a large city or if difficult to find.

EXAMPLE #1 COVER LETTER AND QUESTIONNAIRE SAMPLES

The following examples contain my thoughts in designing and developing a questionnaire for the purpose of selecting the educational institutions and industries most desirable to visit. The final form may vary after some preliminary field testing before initiating the formal questionnaire.

#1-A COVER LETTER - EDUCATIONAL INSTITUTIONS

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I am on a sabbatical leave from Mt. San Antonio Community College, located in Walnut, California, Los Angeles County . I am interested in the possibility of a visit to your institution during the school year 1982-83. To help me in planning this visit and to insure the maximum benifits of time and effort, would you please respond to the enclosed questionnaire and return as soon as possible in the enclosed, stamped, self addressed envolope.

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A- Computer-Aided Design
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C- Elements of Mechanical Design

Your institution has been chosen because of your drafting program and the offerings in one of the three areas above. I would like to spend one or two days visiting your facility to study your program, exchange ideas, obtain samples of your program, and information of the visual aids you use. I will also bring samples of my own work for you to make zerox copies if you desire. I will have a camera and a tape recorder to photograph and record information, etc. , benificial to my own program at Mt. SAC.

While in the area, I would like to visit one of the major industries that hire your graduates. If it is possible I would like the name, title and phone number of a contact person to make the necessary arrangements.

Upon receipt of the completed questionnaire, a schedule and agenda will be made and you will be contacted to see if it would be convienent for me to call on you.

Thank you for your help and support in this endeavor.

Sincerely,

Herman L. Bushong, Jr.
Instructor
Drafting & Design Dept.

#1-B SAMPLE QUESTIONNAIRE - EDUCATIONAL INSTITUTIONS

These are only a few samples of the questions to be asked. The full form and content of the questionnaire is not complete at this time.

_____ _____
Educational Institution Name Address City State Zip Code

( ) _____ _____
Area Code Phone No. Name (Person completing Questionnaire)

_____ _____ _____
Title Department Phone No.

As indicated in the Cover Letter, I would like information regarding your program so that I may plan my trip across the United States visiting educationa institutions and various industries. Your help in completing the questionnaire is most appreciated.

1- Do you offer instruction in the following programs or areas?

A- COMPUTER-AIDED DESIGN (COMPUTER GRAPHICS) _____ Yes _____ No (Please Check)

1- What type of system are you using?

2- Please give the company and model, etc.

a- Central Processing Unit (CPU). General purpose minicomputer?

b-Mass Memory Unit. Disk or Tape?

c- Plotter. Pen,belt, electrostatic or photo plotter?

d- Interactive Terminals. Workstations (Storage & Raster), digitize

e- Software. Operating system, application packages, language support?

f- Other standard Peripheral Devices. Paper tape reader/punch, Line printer, etc.?

3- What was the cost of the program? _____
Year installed _____

4- What is the level of instruction? 1, 2, 3, 4, _____semester.

5- If you were to redesign the program, what changes would you make in the entire system? Please be specific and give as many details as you can on a separate sheet of paper. This is extreemly important in helping me to plan and design a program for use at Mt. San Antonio College. Your experience can help me avoid costly mistakes.

6- What text are you using? Title_____Edition_____

APPENDIX- C

INTERVIEW WITH DIRECTOR/DEAN
OCCUPATIONAL/VOCATIONAL
PROGRAMS

DEANS TITLE AGE

EDUCATIONAL BACKGROUND MS MA EdD Ph D

VOCATIONAL CREDENTIAL

VOCATIONAL ORGANIZATIONS AVA CAVA CIEA SME CCCAOE

AREA OF VOCATIONAL EXPERIENCE IN INDUSTRY

SINGLE-CAMPUS MULTI-CAMPUS DISTRICT

QUESTIONS

1- TO WHAT SINGLE PERSON ARE YOU ANSWERABLE FOR RESULTS?

2- ASSUME THAT YOU ARE WRITING YOUR OWN JOB DESCRIPTION, WHAT ARE THE PRIMARY DUTIES YOU WOULD INCLUDE? PLEASE KEEP IN MIND THAT YOU ARE DESCRIBING WHAT YOU DO AND NOT WHAT YOU WOULD LIKE TO DO.

3- DESCRIBE THE SPECIFIC TASKS OR OBJECTIVES YOU HAVE SET FOR YOURSELF THIS SCHOOL YEAR.

ARE YOU ACCOMPLISHING THEM?

4- HOW ARE YOUR DUTIES OR TASKS RELATED TO THE UNIQUE NATURE OF YOUR COLLEGE?

ARE ANY OF YOUR DUTIES RELATED TO DEVELOPING PROGRAMS UNIQUE TO YOUR COMMUNITY?

5- WHAT ARE THE CRITERIA BY WHICH YOU ARE FORMALLY EVALUATED?

ARE THESE CRITERIA RELATED TO YOUR DUTIES OR OBJECTIVES?

HOW OFTEN ARE YOU EVALUATED? BY WHOM?

6- IF YOU ARE A MULTI-CAMPUS DISTRICT, HOW DOES THIS FORM OF ORGANIZATION AFFECT YOUR RESPONSIBILITIES?

7- IS YOUR JOB DESCRIPTION AN ACCURATE REFLECTION OF YOUR JOB?

HAVE YOU HAD A HAND IN WRITING OR REWRITING THE JOB DESCRIPTION?

HAS IT BEEN REVISED OR REWRITTEN? WHEN?

8- IF YOU WERE TO INTERVIEW FOR A REPLACEMENT FOR YOURSELF, WHAT PERSONAL QUALITIES WOULD YOU BE SEEKING?

WHAT PROFESSIONAL QUALITIES?

10- WHAT WOULD HAPPEN TO YOUR COLLEGE IF YOUR POSITION WERE TO BE ELIMINATED?

11- DO YOU FEEL THAT YOU WORK UNDER PRESSURE OR IN A RELAXED ATMOSPHERE?

APPENDIX - C

A VISIT WITH THE DEAN

MAY I REQUEST A COPY OF THE FOLLOWING FOR MY RESEARCH WORK?

1- JOB DESCRIPTION OF THE DEAN

To develop a composite responsibilities assessment.

2- STATEMENT OF THE COLLEGE PHILOSOPHY, MISSION, GOALS, OR OBJECTIVES

How the job description meets the mission of the college.

3- EVALUATION FORMS USED TO EVALUATE THE DEAN

To develop a composite picture of the deans duties.

4- ORGANIZATIONAL CHART

To examine the authority of the dean.

5- OCCUPATIONAL/VOCATIONAL CLASSES OFFERED OR AREAS OF INSTRUCTION

To determine the areas of interest and community needs.

6- TOTAL COLLEGE ENROLLMENT

7- TOTAL ENROLLMENT IN OCCUPATIONAL/VOCATIONAL PROGRAM

#1-C COVER LETTER - INDUSTRIAL FACILITY

Spring 1982

Dear Sir;

I am on a sabbatical leave from Mt. San Antonio Community College, located in Walnut, California, Los Angeles County. I am an instructor in the Drafting & Design Department of the college and teach classes in Technical (Machine) Drafting, Electronic Schematic Drafting, and Elements of Mechanical Design. I am interested in visiting your facility to study the industrial process and techniques used in manufacturing today. I would like to see any automated systems and robotics in use, as well as, the drafting techniques & standards, computer-aided design (graphics), etc., you may be using in your engineering department.

If it is possible for me to visit your facility, please send me the name of a contact person, title and phone number, so that I may plan my trip and make an appointment for a visit.

Thank you for your courtesy and assistance,

Sincerely,

Herman L. Bushong, Jr.
Instructor
Drafting & Design Dept.

NOTE: If the facility has been recommended by one of the schools I have contacted, I will so indicate. When the visit is approved, I will request permission to take photographs, tape conversations etc. for use in the classroom. In addition I will have developed a short questionnaire which I will score during the interview for job entry knowledge and skills required of community college graduates. In addition I will have specific questions regarding the drafting standards used in that industry. This will tell me if I am teaching transfer standards for the student to use in major industries. I will also request drafting samples, literature, visual aids, etc., anything that will help me to tell students what the REAL WORLD is really like.

Year_____ Author _____Publisher_____

7- Are you using a workbook? Yes_____ No_____
Title_____Edition_____ Yr_____ Author _____

Publisher_____

8- Do you have audio visual aids for the program? Yes_____ No___
What type? Film Strip or slides _____ , Audio tape_____,

Movie_____, Video Tape_____ Other_____

B- ELECTRONIC SCHEMATIC DRAFTING Yes___ No___

1- What Text are you using? Title_____Edition___
Yr_____ Author_____ Publisher_____

2- Do you use a workbook? Yes___ No_____ Title_____
Edition_____ Yr_____ Author_____Publisher_____

3- What areas of instruction do you cover? Do you have Audio Visual Aids for the program? Please use the following code; FS=Film Strip, T= Tape Recording, M= Movie, VT= Video Tape.

PROGRAM	Yes	VISUAL AIDS Code
a- Block Diagram	____	_____
b-Schematic Diagrams	____	_____
c- Cable Drawings	____	_____
d- Printed Circuit Boards	___	_____
e- Wiring Diagrams	____	_____
f- Intergrated Circuits	____	_____
g- Flip-Flop Circuits	____	_____
h- Other_____		_____
_____		_____

C-ELEMENTS OF MECHANICAL DESIGN Yes____ No_____

1- What Text do you use? Title_____Edition___ Yr____
Author_____Publisher_____

2- Do you use a workbook? Yes_____ No_____
Title_____Edition_____ Yr_____ Author_____
Publisher_____

3- What areas of instruction do you cover? Do you have Audio Visual Aids for the program? Please use the same code as above.

PROGRAM	Yes	VISUAL AIDS Code
a- Belt Drives	_____	_____
b- Chain Drives	_____	_____
c- Gears	_____	_____
d- Couplings & Flexible Shafts	_____	_____
e- Clutches	_____	_____

APPENDIX - D

BUSHONG, HERMAN ERIC
QUERY 1637 1966 - FEB 1983 (BOTH

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AN EJ258088.
AU GREENAN, JAMES P.; PHELPS, L. ALLEN.
TI DELIVERING VOCATIONAL EDUCATION TO HANDICAPPED LEARNERS.
SO EXCEPTIONAL CHILDREN; V48 N5 P408-11 FEB 1982. FEB82.
LG EN..
IS CIJJUN82.
CH EC141279.
PT 080; 143.
YR 82.
MJ DISABILITIES. EDUCATIONAL-POLICY. VOCATIONAL-DIRECTORS. VOCATIONAL-EDUCATION.
MN ADMINISTRATOR-ATTITUDES. ELEMENTARY-SECONDARY-EDUCATION. SURVEYS.
AB THE STATE DIRECTORS FROM EACH OF THE 50 STATES, DISTRICT OF COLUMBIA, AND SURROUNDING TERRITORIES IDENTIFIED EIGHT PROBLEM AREAS: INTERAGENCY COOPERATION AND AGREEMENTS; FUNDING AND FISCAL POLICY; SERVICE DELIVERY AND PROGRAM ALTERNATIVES; PERSONNEL PREPARATION; STATE LEGISLATION, PLANS, AND POLICIES; FEDERAL LEGISLATION AND REGULATIONS; PROGRAM EVALUATION AND IMPROVEMENT; AND ATTITUDES. (AUTHOR).

****

AN ED211826.
AU LESKE, GARY; FREDERICKSON, STEVE.
IN MINNESOTA UNIV. MINNEAPOLIS. RESEARCH AND DEVELOPMENT CENTER FOR VOCATIONAL EDUCATION. (BBB17852).
TI NEEDS ASSESSMENT FOR VOCATIONAL EDUCATION ADMINISTRATORS: AN EVOLVING SYSTEM FOR STAFF DEVELOPMENT DECISION MAKING. USER'S MANUAL.
LG EN..
GS U.S. MINNESOTA..
IS RIEJUN82.
CH CE031131.
PR EDRS PRICE - MF01/PC03 PLUS POSTAGE.
PT 055; 160.
LV 1.
NT 67P. ; FOR RELATED DOCUMENTS SEE ED 198 246-247.
YR 81.
MJ NEEDS-ASSESSMENT. PROFESSIONAL-DEVELOPMENT. SELF-EVALUATION-INDIVIDUALS. VOCATIONAL-DIRECTORS.
MN ADMINISTRATOR-ROLE. FEEDBACK. INTERPROFESSIONAL-RELATIONSHIP. MANAGEMENT-DEVELOPMENT. PEER-EVALUATION. TEACHER-ADMINISTRATOR-RELATIONSHIP.
AB TO HELP VOCATIONAL EDUCATION ADMINISTRATORS PRODUCE A PERSONAL PLAN FOR PROFESSIONAL DEVELOPMENT, THIS MANUAL DESCRIBES HOW TO USE NEEDS ASSESSMENT INSTRUMENTS, PREPARE THE FEEDBACK, AND INTERPRET THE FEEDBACK. AN INTRODUCTION BRIEFLY REVIEWS THE PROJECT THAT DEVELOPED THE PROCESS AND DEFINES POTENTIAL USERS AND NEEDS ASSESSMENT. THE NEEDS ASSESSMENT PROCESS IS THEN DESCRIBED THAT INVOLVES USE OF THREE DIFFERENT INSTRUMENTS FOR SELF EVALUATION AND PARALLEL EVALUATION BY BOTH SUPERORDINATES OR COLLEAGUES AND SUBORDINATES. THESE AREAS ARE EXAMINED: ADMINISTRATIVE KNOWLEDGE BASE, OPERATION IN GENERAL ADMINISTRATIVE/MANAGEMENT PROCEDURES, AND FUNCTIONING IN TERMS OF ADMINISTRATIVE TASKS. INFORMATION IS PROVIDED FOR EACH MAJOR

GET COPY

APPENDIX - D

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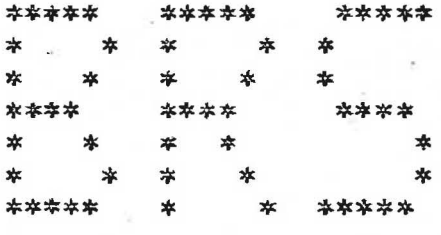
BUSONG, HERMAN
AJM
VOCATIONAL ED DIRECTORS



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APPENDIX D

NOVA UNIVERSITY

Fort Lauderdale

Flordia

Job Responsibilities of California Community College Deans of Occupational/Vocational Education

A major research project submitted in partial satisfaction of the requirements for the degree

Doctor of Education

by

Herman L. Bushong, Jr.

1983

APPENDIX D

CHAPTER I

INTRODUCTION

Purpose

Despite a leveling off of enrollments in higher education, technical education continues to attract increasing numbers of students who look to it for preparation for a variety of occupations.

If a community college is to offer an innovative, student oriented curriculum in this age of high technology, attention must be focused on the dean of occupational/vocational education, the administrator on campus who is most responsible for improvements in the quality of occupational/vocational instruction. This administrator has the responsibility of determining the variety of programs to be offered and the quality of instruction necessary to prepare students to meet these needs.

Since little research has been accomplished on the duties and responsibilities of this administrator, the purposes of this study are:

1. To develop a composite responsibilities assessment for the community college dean of occupational/vocational

education based on formal job descriptions published by California colleges.

2. To develop a composite picture of the dean's duties through the examination of the forms used by the community colleges to evaluate the dean.

3. To compare the composite evaluation criteria with the job description duties.

4. To examine the dean's position of authority by an analysis of the dean's position in his college's organizational chart.

5. To determine if the dean's duties are influenced by the unique characteristics of the college where the dean is employed.

6. To determine the perceptions of deans in regard to their basic duties and responsibilities, and to compare each dean's perceptions with the job responsibilities, evaluation criteria, and unique nature of his college.

Methodology

In order to gather information associated with these purposes the following steps will be taken.

1. A letter will be sent to presidents of all California community colleges asking for the official job description of the dean of occupational/vocational education, the form being used to evaluate the dean, an organizational chart showing the administrative structure of the college, and a

statement of college's philosophy and educational goals (Appendix _).

2. The responsibilities or duties listed in the college job descriptions will be compiled. The compilation will include each duty as a percentage of the total colleges reporting.

3. All of the duties will be grouped using the following five categories: Administration (providing educational leadership and management to the college, Communication-Liaison (communicating the college's policy and programs within the college, and to institutions, groups and communities without the college), Committee Participation (taking part in and supervising committees), Curriculum (planning and supervising the course offerings of the college), Instruction (administration of the instructional process and the instructional personnel). Each of the responsibilities will be defined in a paragraph using the language taken from the job descriptions. Responsibilities will be listed in descending order of frequency reported by the colleges.

4. Dean evaluation forms will be divided into four classifications: administrative forms, administrative check-lists for all employees, evaluation by success in achieving management objectives, and evaluation check lists unique to the dean of occupational/vocational education. A composite picture of the dean's responsibilities will be made by

evaluation criteria and the duties listed in job descriptions.

5. College organizational charts will be examined in order to analyze the dean's job in terms of line authority and individuals supervised.

6. The colleges' educational goals will be studied to determine how the goals vary from college to college. The use of goals as a means to determine unique college characteristics will be examined and how these goals affect the deans responsibilities.

7. The size of student enrollment and district organization (single campus or multi campus) will be examined to determine what influence this may have on the deans' responsibilities and his authority as reflected in job descriptions, organizational charts, evaluation forms, and self-defined objectives.

8. In order to determine the influence of other college characteristics, geographic location, racial mix of students, and the age of the college, a similar percentage comparison will be made between single and multi-campus district colleges.

9. A select number of deans will be personally interviewed in the southern california area concerning their views of their responsibilities. The selection of the deans will be determined by the location of the college, size of the college enrollment, organization of the college district, and demographic features of the community.

10. The interview will be a face to face interview of approximately one hour. Deans will be asked to respond to the following questions:

In a few sentences describe the purpose of your position.

To what single person are you answerable for results?

Assume you are writing your own job description. List the primary duties you would include. Keep in mind that you are describing what you do, not what you would like to do.

Describe the specific tasks or objectives you have set for yourself this school year.

How are your duties or tasks related to the unique nature of your college? Are any of your duties related to developing programs unique to your community?

What are the criteria by which you are formally evaluated? Are these criteria related to your duties or objectives?

If you are in a multi-campus district, how does this form of organization affect your responsibilities?

Is your job description an accurate reflection of your job? Have you had a hand in writing or rewriting it?

If you were to interview for a replacement for yourself, what personal qualities would you be seeking?

What would happen to your college if your position were to be eliminated?

See appendix _ for the complete interview form to be used.

11. Interview data will then be summarized. Each summary will emphasize how the deans' duties were influenced by the unique characteristics of the college where the dean was employed. A comparison will be made of the deans' conceptions of their functions with the colleges' conceptions as revealed in the job descriptions and evaluations. Analysis will concentrate on the deans' opinions concerning the influence of campus size and district organization.

12. A compilation will be made of management objectives which the interviewed deans had set for themselves. These objectives will be listed in descending order of frequency that they were reported.

Rationale for the Study

In June, 1978 with the passage of Proposition 13 and its drastic reduction in California property tax revenue, Rose (1980) points out that it brought an end to an era of rapid community college development in California. Community colleges have been placed in a financial limbo. As the decade of 1980 opens it is of major importance for the California community colleges to identify those

issues which will be pivotal in determining their roles, their financing and their governance.[1]

Despite a leveling off of enrollments in higher education, Prakken (1982) states that technical education continues to attract increasing numbers of students who look to it for preparation for a variety of occupations. Since the community college strives to serve the needs of the community, the role of the dean occupational/vocational education is most critical in bringing about needed educational improvement in the community college.[2]

It is the author's contention that the dean of occupational/vocational education's office is of vital importance in causing needed educational improvement in the community college. Roueche (1970) has argued that while college authorities have been generous in identifying two year colleges as superior teaching institutions, there is evidence to indicate that their instructional practices are no different than those employed by other colleges serving different types of students.[3]

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[1]Thomas A. Rose, "A Determination of Critical Issues Facing the California Community Colleges in the 1980s as Preceived by members of the California Community and Junior College Association", Unpublished doctoral dissertation, University of Southern California, 1980. P. 2.

[2]Lawrence Prakken, Forward, Technical Education Yearbook - 1982, Ann Arbor, Michigan, 1982. P. iii

[3]John P. Roueche and Barton P. Herrscher, "A Learning Oriented System of Instruction," Junior College Journal, 41, No. 2 (October, 1970), P. 27.

The Newman report (1971) indicated that community colleges were suffering in terms of the poor match between the student's style of learning and the institution's style of instruction.[4] In a 1971 survey of literature on the community college, Thornton indicated that the dean's basic responsibilities of class scheduling and instructional supervision are the key to the college's success since these duties involve decisions which "converge the forces" of instructors, students, time, buildings and equipment, and units of credit into a single educative process.[5]

Yet, little research has been accomplished on academic deans at any level of higher education. Wicke (1963) concluded that doctoral dissertations on the role of a campus academic dean, though promising on initial examination, have been nothing more than a cursory examination of what the dean was doing on a campus or two, and then to "proceed from this to reach conclusions, usually highly subjective, as to what deans ought to be doing."[6]

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[4]Frank Newman, Report on Higher Education (Washington, D.C.: U.S. Government Printing Office, 1971), P. 71.

[5]James W. Thornton, The Community Junior College (3rd ed.; New York: John Wiley and Sons, Inc., 1972), PP. 169-179.

[6]Myron Wicke, "Deans, Men in the Middle," in The Study of Academic Administration, ed by Myron Wicke (papers presented at the fifth annual institute on College Self Study at the University of California at Berkeley, July 22-26, 1963, Boulder, Colorado: Western Interstate Commission for Higher Education), P. 113.

Those concerned with such studies have noted that scientific measurement of the instructional supervision process has been almost totally lacking. In a 1969 survey of community college institutional research, Cohen and Quimby indicated a need for research on organizational and administrative climate in the junior college, concluding that in general, studies on junior college administrators (such as dean) have been confined to measurement of formal legalistic rules concerned with suggesting prescriptive administrative behavior.[7] These investigators suggested that more research was needed on the task orientation of the community college administrator, especially in his relationship to the community. After examining attitudes of 238 junior college faculty members in three colleges, Park (1971) concluded that research on perceptions and values of those junior college administrators who hire and supervise teachers are vitally needed.[8] In a 1969 review of junior college faculty evaluation schemes, Cohen and Brawer theorized that instructional supervision too often is applied inconsistently

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[7]Author M. Cohen and Edgar Quimby, "Trends in the Study of Junior Colleges, 1970," ERIC Junior College Research Review, 5, No. 1 (September, 1970), 6.

[8]Young Park, Junior College Faculty, Their Values and Perceptions, ERIC Clearinghouse for Junior College Information Monograph (Washington, D.C.: American Association of Junior Colleges, 1971), P. 52.

in the junior college, and that much of this inconsistency is due to the lack of research on the junior college instructional supervision.[9]

Literature on the role of the community college dean revealed a mere handful of studies on the dean's rule, and most of these indicated a common dissatisfaction with the educational programs for which the dean was responsible. However, there appeared to be some optimistic predictions regarding improvements in instructional supervision in the near future.

In many cases Wenrick (1974) states that the role of the principal occupational education administrator has been compromised needlessly in the interest of retaining the outmoded junior college organizational pattern for administration and governance.[10]

Looking into the future Barlow (1976) stresses the importance of the principal occuational/vocational administrator as a leader. One who is essentially devoted to providing the environment necessary so that the creative, imaginative and dedicated teacher can develop under the most desirable

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[9]Arthur M. Cohen and Florence B. Brawer, Measuring Faculty Performance, ERIC Clearinghouse for Junior College Information Monograph (Washington, D.C.: American Association of Junior Colleges, 1969), P. 70.

[10]Ralph C. Wenrich and William J. Wenrich, Leadership in Administration of Vocational and Technical Education. Columbus, Ohio: 1974, P. 70.

conditions.[11]

It is the hope that the findings of this study will contribute information on the dean which will lead to improved administration in occupational/vocational education.

Limitations of the Study

The present investigation of the community college dean of occupational/vocational education's duties as measured by job descriptions and checked against evaluation criteria, district goals, organizational charts and interviews has several limitations:

1. The exclusion of all colleges outside of California for the survey and the limitation of interviewing to Southern California may omit other patterns of the deans' responsibilities.

2. The study excludes all but the colleges' and the deans' perceptions of their roles. How the dean does spend his time might be perceived differently by those superior to him (president, dean of instruction), those responsible to him (division deans, department chairmen) or those parallel with him (other deans).

3. The study does not take into account the amount of time spent by deans on various duties; it simply deals with what the duties are.

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[11]Melvin Barlow, 200 Years of Vocational Education, Arlington, Va.: American Vocational Association, 1976. P. 543.

CHAPTER II

REVIEW OF THE LITERATURE

A review of the professional literature and appropriate research reports was undertaken as a preliminary phase of the study. This investigation revealed a lack of information related to the qualifications, responsibilities and professional competencies associated with occupational/vocational education administrators in California. An analysis of this information served as a basis for determining the need for further research.

In order to provide the tools of analysis and insights necessary to analyze the dean of occupational/vocational education job descriptions, this chapter will present: (1) a review of the literature on job descriptions, organcharts, and evaluation; and (2) a summary of studies on the dean of occupational/vocational education job responsibilities.

One could conceivably argue that the dean's duties are determined by his desire to perform in a certain role. Role performance, according to Biddle and Thomas, is determined by social norms, demands and rules, role performance of others in their respective positions, and by the individual's particular capability and personality.[1]

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[1]Bruce J. Biddle and Edwin J. Thomas, Role Theory Concepts and Research (New York: John Wiley and Sons, 1966), P. 7

Job descriptions are directly related to the philosophy of the institution and to its organizational chart. A compilation of all job descriptions within the institution will provide a composite picture of the mission of the institution. The purpose of job descriptions was to eliminate unnecessary activities of workers and prevent duplication of effort. In the absence of a job description, a role performance analysis was made.

Definition of Terms

A job description is an organized and formalized statement of duties and responsibilities for a particular position or can be termed a written record of the functions of a particular position.

A job analysis is the process of getting the facts about jobs by observing and talking to workers in order to describe in detail the work involved, the conditions under which it is to be performed, and the qualifications necessary for the worker who must perform it.

Job specifications are specific qualifications and training required of individuals who might hold a job, such as certification, experience, personality characteristics for good supervision.[2]

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[2] Job Descriptions, How to Write Them, How to Use Them (Arlington, Va.: Administrative Leadership Service, 1966), PP. 2-3.

The review of literature on job descriptions is presented in five sections. (1) Indicate the value of job descriptions in education, (2) define what a good job description is and show how job descriptions are used and misused, (3) indicate the use of organizational charts as a vital aid to job descriptions, (4) examine the use of administrative job descriptions in public education and colleges, and (5) indicate the use of evaluation in managerial systems approach in colleges.

Value of Job Descriptions in Education

According to an article published by the Administrative Leadership Service's 1966 national survey of public school job documents, a job description should tell exactly what an individual is to do, how he is to do it, why he should do it, and how well the job is to be done. Too often, the Administrative Leadership Service claimed, public school administrators have disdained job descriptions as undignified for professionals and too filled with the threat of evaluation, despite their extensive use by industry and government. The advantages job descriptions offer to school districts are: they encourage better utilization of staff members, they bring about greater teamwork, and they give a sense of personal security to staff members, i.e., used with an organizational chart, the job description enables the employee to know the part he plays in the organization. A properly framed school job description should group and categorize

duties and responsibilities and describe desired levels of competence.[3]

Activities of a school administrator (such as the community college dean of occupational/vocational education should start with the functions of the administrator to carry out the school board's policies. An administrator's functions could be divided into the following categories: (1) relations with board and staff members, (2) supervision of personnel, (3) instruction, (4) pupil personnel, (5) business and finance, and (6) school and community relations. The ideal number of categories is five to eight; more than eight categories makes an administrator job listing too unwieldy. The complexity of the education job is also a vital consideration. Even the title of the job should immediately give a clue to its administrative function.[4]

Writing and Using Job Descriptions

The Administrative Leadership Service stressed that a job analysis and the subsequent description writing should be done as objectively as possible. If a person is new to a job, he should not write the job description himself. The document should deal with the position, not the person, since the job should conform to organizational needs. It is true, however, that how well an individual functions in a

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[3]Ibid., P. 2.

[4]Ibid., PP. 13-16.

position actually depends a great deal on the person himself.[5]

A variety of opinions are held on the question of when a job description should be rewritten and who should participate in the writing. Evans in a 1964 study of 217 companies found 43.6 percent of companies wanting job delineations spelled out when the job itself changes, 14.9 percent believed the revision should occur at regular intervals no matter what is happening, 14.5 percent said rewriting happens whenever the job holder asks for a review of his duties, and 10.6 percent said the rewriting must occur whenever the job changes hands from one employee to another.[6]

Regardless of who writes the job description, McMurray (1966) believed that the document should reveal the following: (1) to what extent the job to be filled is rigidly structured, routinized and regimented as contrasted with a pioneering, varied, nonroutine type of activity, (2) how closely supervised is the work, (3) what kind or type of associates does the job holder work with and what are the duties of these associates (in the case of the dean of occupational/vocational education, other deans), and (4)

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[5]Ibid., P. 16.

[6]Gordon H. Evens, Managerial Job Descriptions in Manufacturing, AMA Research Study No. 65 (New York: American Management Association, Inc., 1964), P. 69.

is the job holder under pressure or does he work in a relaxed atmosphere.

In drawing up a proper job description the questions to be answered are: (1) what are the duties of the job, (2) what steps are to be taken to perform these duties, (3) what equipment is used, (4) what are the working conditions under which the specific job is performed, (5) the relations of the job to others, (6) what is the responsibility of the operation, (7) what is the amount of authority to be delegated, and (8) who gives the job holder his instructions?[7]

The ideal job description, as conceived by McMurray, gives the proper balance between being too detailed and too general. It should indicate the degree of self-reliance which the job requires. Specifications should deal with the relationships with the immediate supervisor (in the case of the dean occupational/vocational education the working relationships with the dean of instruction or the college president). The unique characteristics of the employing organization should be made clear.[8]

After a survey of seventy-five chemical process firms in 1966, Berenson and Ruhnke suggested that a good job description should be compiled in such a way that employees

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[7]Robert N. McMurray, Trusted Techniques of Personnel Selection (Chicago, London: The Dartness Corp., 1966), P. 210.

[8]Ibid., P. 13.

feel the position, not just themselves, is being studied. The compilation should result in a duty delineation of never less than two pages, otherwise important details would be omitted. Nor should it be more than three pages because the description would then be too detailed for effective use. They cautioned that most of the job descriptions they had seen in their study neglected to indicate the relative amounts of time devoted to the various functions.[9]

The following uses can be made of effective job descriptions: (1) to establish a rational basis for the salary schedule, (2) to clarify relationships between jobs, thus avoiding overlaps and gaps in responsibility, (3) to help employees on all levels acquire greater understanding of their present jobs by analyzing their duties, (4) to help revise the organization structure on any level, (5) to reassign and to fix functions and responsibilities in the entire organization, (6) to evaluate job performance by comparison between what the employee does, and what the job description says he should do, (7) to introduce new employees to their positions, (8) to assist in hiring and placing employees in the jobs for which they are best suited, (9) to set forth lines of promotion within all departments and at all levels, (10) to forecast the training needs for

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[9]Conrad Berenson and Henry O. Ruhnke, "Job Descriptions: Guidelines for Personnel Management," Personnel Journal, 45, No. 1 (January, 1966), 14-15.

a particular function, (11) to maintain continuity of all operations in a changing work environment, (12) to provide data as to proper channels of communication, (13) to be useful in the development of job specifications which list the personnel requirements for each position, (14) to serve as a basis for manpower planning, (15) to improve the work flow, and (16) to review critically the existing practices in the organization.[10]

Personnel managers, Berenson and Ruhnke contended, could get greater value from job descriptions by taking into account a few warnings: (1) good job descriptions take time to write (a middle management position such as dean of occupational/vocational education would take up to one year to rewrite carefully), (2) job descriptions must be kept up to date, (3) job description writing should be taken seriously, (4) all departmental personnel should have easy access to the file of job descriptions, (5) quantitative or measurable responsibilities should be listed in the descriptions, (6) more than one source or person should be used to gather the necessary data to write the description, (7) the uses to which the job description will be put must be kept in mind when it is being devised (for example, if the description will be used to clarify relationships between

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[10]Conrad Berenson and Henry O. Ruhnke, Job Descriptions: How to Write Them and Use Them (Swarthmore, Pa.: Personnel Journal, 1969), PP. 12-19.

the dean and other line and/or staff administrators, then the job analyst must examine all the existing relationships and indicate in the description clearly what they are, i.e., how the dean is to work with the president, other deans, and department chairmen in cases of shared responsibility), (8) the description should be introduced at the proper time, (9) the analyst must secure the confidence of the employees, (10) job descriptions must be comprehensible, free of technical jargon and phrases that might have meaning only to a few individuals.

The authors concluded that an organization's official duty listings should not be too detailed or interpreted too rigidly. If too narrowly interpreted, such documents can paralyze an organization or reduce its efficiency. Job descriptions should just be considered as guides to action.[11]

The underutilization of position descriptions by most organizations concerned Gehm (1970) as he contended that companies believed there was a correlation between their successes and the degree to which they ignored job descriptions.[12] Companies with such attitudes could advance several arguments against the use of the descriptions: (1) they limit the job holder to the tasks included in the description, (2) they require too much work to prepare, (3) they are quickly

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[11]Berenson and Ruhnke, Job Descriptions: How to Write and Use Them, PP. 20-29.

[12]John W. Gehm, "Job Descriptions--A New Handle on an Old Tool?" Personnel Journal, 19, No. 12 (December, 1970), 983.

outdated and require revision, (4) people normally know what they are supposed to do, (5) people will only do the minimum required of them--that listed in the description, and (6) the jobs of management are not describable but are unique to the position and the manager filling it.[13]

Such arguments, Gehm claimed, were not valid. Without job descriptions, companies would experience confusion, misapplied effort and failure of the employee to assume responsibility. Furthermore, the lack of position clarifications would mean an employing organization would have no basis on which to evaluate performance and to grant awards accurately or fairly.[14]

The work flow approach of describing managerial work received the attention of Chapple and Sayles (1961). This approach is based on the use of time measurments. It demands precise specifications of what each person does, when, where and with whom, how long and how often. A job description written with this approach would specify in quantitative measurement the duration of the action and interaction required to carry out management activities.[15] Such a listing would be written to show managers where to avoid

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[13]Ibid., P. 984.

[14]Ibid., P. 985.

[15]Eliot D. Chapple and Leonard R. Sayles, The Measure of Management Designing Organizations for Human Effectiveness (New York: The Macmillan Co., 1961), P. 44.

breakdowns and inefficiencies. So written, anyone could step into a position and know what he would receive in terms of duty assignments, working material and products, what he should do with what he receives, and where the material and products should go. As long as the work flow is moving smoothly, such a description is adequate, Chapple and Sayles contended: but for higher levels of management (such as dean of occupational/vocational education) the description would be inadequate for it fails to deal with the decision making, goal planning function of management.[16] They explained to the administrator concerned with the problems of developing an organization, management is a constant process of tinkering with people, with the jobs and with the structure of authority to create the teamwork necessary for improved performance.[17] Therefore, in their view, a duty-responsibility type description is the most adequate; yet it fails to deal with the problems of contact and communication within an organization. They explained that a job description rarely indicates a behavior required of the man who is to fill a particular job. Descriptions indicate responsibilities and authority and perhaps the necessary experience, but seldom the actual interpersonal requirements. Such terms as "coordinate with," "has functional responsibility for,"

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[16] Ibid., PP. 49-52.

[17] Ibid., P. 48.

and "little operational meaning," are used too frequently.[18]

Yet Chapple and Sayles felt a job description can be established in terms of number and type of contacts required of the individual to carry out the inherent relationships. The contacts of each individual on the position can be measured and his behavior with different people described. A job description can be prepared from this information to tell how an executive is to act, with whom, and for how long. A properly written description, accompanied by a carefully prepared organizational chart, makes it easier to determine whether an organizational problem arises from a personality clash or from poorly defined responsibility.[19]

Up to this point it would appear that if the dean's office can be termed management, the job description should deal with his position in his particular college and should delineate his authority relationships with associate deans and other department chairmen. It should be specific enough to make clear the duties he is to carry out but general enough to allow him to perform his duties without the description acting as a straight jacket. Responsibilities of the dean should be categorized by the type of decision made. A proper job analysis should serve to match a candidate for the dean's position to the institution hiring him.

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[18]Ibid., P. 102.

[19]Ibid., P. 112.

Rakich (1972) found that the chief function of a personnel system was obtaining, maintaining and retraining the human resources of the organization. The qualifications or ability to perform effectively can only be determined if the content and requirements of the dean as presented in the job description are known. It is necessary for promotion policies to measure performance against a given standard.[20]

Chandler and Petty (1975) also stressed that the job description should deal with the uniqueness of particular situations. The job descriptions then of the dean of occupational/vocational education should vary with the uniqueness of the college and the community the dean serves.[21]

A systems approach was developed by Fawcett (1964) when he referred to job descriptions as essential tools in selection of personnel, in evaluation of performance, in planning of the work of the organization, in determining salary structures, in promoting personnel and in many other aspects of the personnel process. The purpose of a school district, he wrote, should be to develop descriptions that fit goals of the district to the curriculum of students.

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[20]Johnathan S. Rakich, "Job Descriptions, Key Element in the Personnel Subsystem," Personnel Journal, 51, No. 1 (January, 1972), PP. 43-45.

[21]B. J. Chandler and Paul V. Petty, Personnel Management in School Administration (New York: World Book Co., 1965, PP. 24-30.

Employees should know the skills and value systems required of them.[22]

Gibson and Hunt (1965) called for a position statement which included the rights and duties attached to the position, desired standards of performance in the position and relationships with other positions. They felt that the difference in specificity of position analysis depends upon the differential specificity of task content in the positions. As teaching and particularly teaching supervisory positions is professional, the person who takes professional responsibility seriously will not want the position analysis to be too prescriptive.

Organizational Charts

A person new to a managerial post would find it difficult to understand his place in the organization without a careful study of the employer's organizational chart. From a glance at the chart it is easy to see the position's relation to the managerial positions throughout the company. The chart makes it possible to omit such detail in the written description. It clarifies vertical relationships, and answers questions of delegation of authority not clear from the job descriptions. Although there is considerable

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[22]Claude W. Fawcett, School Personnel Administration (New York: The Macmillan Co., 1964).

precedent for showing the senior executive at the top with subordinate levels below in pyramid fashion, there is no fixed rule for setting up organizational charts. When an employer's structure is delineated, comparable units are often placed on the same line, with the size and weight of the boxes and printing suggesting relative status.[23]

In other words, an organization chart is simply a presentation technique. Famularo (1971) theorized that when one sees an organization chart, his understanding of the company becomes clearer; when one creates a chart, he also gains a clearer understanding of the company. Uses of a chart can be for a historical record of organization change, an informational device for orienting new employees, a workplan for considering business expansion, and an information piece for the public. The weakness of organization charts is that they show only the formal relationship between positions, not the informal relationships.[24]

As an organization increases in size, organizational charts become even more necessary. As more people are employed, more division or decentralization of responsibilities is necessary. This development brings about a delegation of

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[23]Joseph J. Famularo, Organizational Planning Manual (New York: American Management Association, 1971), P. 6.

[24]Ibid., PP. 21-23.

authority for the making of decisions and the establishing of decision making policy to successive echelons of executives and supervisors. Because such decentralization gives added authority to more individuals, it emphasizes the need for clearer definitions of functions, responsibilities, authority, relationships and accountability of each position. The organizational chart plus a carefully worded job description supplies this informational need. Accompanying managerial job descriptions should help the manager to organize and approve the organizational structure, should explain and clarify who is responsible for what within the organization, should help personnel managers in recruitment, and should serve as guide for performance appraisal. The managerial description should explain what the job holder may delegate, and for what he is ultimately personally responsible. Charts and job descriptions must be updated. A job description or chart will be practically useless or even misleading if it merely gives a picture of what the position used to be.[25]

To be most effective the updated descriptions and charts should be accompanied by a policy or philosophy statement of the company. When carefully developed and intelligently administered, the statement forms a base for management by principle, by operational control, and by

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[25]Ibid., PP. 143-149.

expediency. It is a guide to individual managerial action, a broad permit for the manager to exercise judgment. Such a statement gives management a sense of continuity. It supports company expansion through more effective communication, and it promotes teamwork, productivity, and the pulling together of all decision makers.[26]

Charts can at best give an accurate picture at a given point in time. They are limited in that they are only two-dimensional representations of a company structure; they never accurately reflect degrees of decentralization or delegated authority. They do not always properly indicate all channels of communication or the relative status of the positions depicted.[27]

Dean of occupational/vocational education job descriptions are more meaningful when accompanied by a college's organization charts, especially if the line and staff relationships between the dean, other deans, and faculty members are clearly defined. Researchers on the dean's place in a college would also be wise to include a comparison over a period of time.

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[26]Ibid., P. 231.

[27]Harold Stieglitz and C. Donald Wilkerson, Corporate Organizational Structures, Studies in Personnel Policy No. 210 (New York: National Industrial Conference Board, 1968), P. 3.

Administrative Job Descriptions in Education

As was noted earlier, the use of job descriptions in education has been limited, but some writers have explored the use of position analysis in education as a tool to bring about staff quality improvement. For instance, Mehoney (1968) believed the techniques in management analysis and description were extremely applicable to public school administrators. As it had been with industry, he felt job description analysis had first been used extensively with lower line positions (teachers) rather than administrators. This reluctance was due to the fact that it was a relatively new personnel technique, the feeling that duties of administrators were intangible, and the feeling that it was too complicated to list and measure the responsibilities of a position that dealt with the managerial skills of planning, directing, controlling, appraising and supervising. An administrative job description, according to Mehoney, should: (1) describe the function of the administrative position in the school system, (2) identify the responsibility, authority and accountability of a position, (3) indicate the division, assignment and relationship of control positions, (4) aid in selecting, promoting, transferring and training of administrative personnel, and (5) provide definitive systematic and factual data for determining the relative

worth of the positions.[28]

Mehoney suggested public school administrative positions could be measured on seven axes or scales from a low of 1 to a high of 7 as a descriptive device: (1) responsibility for planning (from routine decisions to long run goals), (2) knowledge (from strictly one's own job to the whole school system), (3) judgment (freedom from decisions made within the confines of most policies and subject to supervisory reversal to the making of final decisions affecting the whole school community), (4) managerial responsibility (from no supervisory responsibility to the managing of diverse departments and the determining of quantity and quality of work within each department), (5) number of persons supervised (from one to five to over two thousand), (6) cost responsibility, (7) amount of contacts with others, and (8) creativity and complexity of the work.[29]

Properly written administrative job descriptions should clearly define functions and relationships so that they hold up when tested by organization oriented decisions, according to Knezevich (1969). Top echelon administrators (such as junior college presidents) should be given duties

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[28]Leo G. Mehoney, "Position Analysis of Administration Personnel in Public School System" (paper presented at the annual meeting of the American Educational Research Association, Chicago, February 7-10, 1968), P. 3.

[29]Ibid., PP. 10-12.

concerned with defining and redefining educational missions and have very few responsibilities involved with operational activities. Second echélon administrators (such as deans of instruction) should be given duties which focus on executing operational activities.[30]

Once an administrator is hired he is often left to his own devices, sometimes not understanding his responsibilities or facing an inadequate out-of-date job description. A 1965 study of the Baldwin, New York school district revealed a plan whereby district goals, job analysis and responsibility, and evaluation were geared together for the district's administrators. As a result the district has installed a system where every administrator (from assistant principal up to superintendent) engages in a yearly job assessment which forces him to examine his own job, and to determine what his objectives are and the steps to reach them in the next twelve months. This approach, according to the Superintendent, made it possible for him to evaluate the work of the members of the administrative staff, both in terms of their understanding of the position and their performance. Furthermore, this approach was particularly necessary because

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[30]Stephen J. Knezevich, Technology and the School Executive, Applying the Systems Approach on Administrative Technology (Washington, D.C.: American Association of School Administrators, 1969), P. 106.

as the district grew areas of responsibility and lines of authority had a tendency to become crossed and fuzzy.

Under the plan each year every administrator is given a form which is headed by a list of district goals or objectives (a list which they, the administrators, have had a hand in forming). Included in the form are the following questions and requests for information: To what single person are you answerable for results? List all persons to whom you regularly send information. If you were to advertise for a replacement for yourself, what qualities would the advertisement specify? In one or two sentences state the overall purpose of your position. Why does the position exist? Show by task your position. Indicate the nature of each duty--supervision, execution, administration, policy making or planning. Indicate your decision making authority. By what means are each of your duties evaluated? List the people directly involved in the performance of each duty. What percentage of your time is devoted to each duty?[31]

If the superintendent saw that his concept of a position and the concept of the position held by subordinates differed, he either changed their approach or his own. Any duty not related to bringing about specific objectives was questioned. The chief advantages of this program were seen as: (1) the forcing of each administrator to evaluate

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[31]"How to Keep Tabs on Your Administrators," School Management, 9, No. 4 (April, 1965), 95-97.

himself, (2) the opening up of the channels of district communication, and (3) the providing of orientation for new administrators.[32]

Responsibilities of College Administrators

Although little research has been accomplished on the use of job descriptions for college administrators, some writers have analyzed the types of decisions college educational leaders make in carrying out their responsibilities. For example, Peterson (1971) believed that a distinction could be made between policy decisions which concern the college's goal priorities (program strategies and mechanisms for obtaining resources), managerial decisions which concern the allocation of resources among programs (the coordination of efforts for goal achievement and the mediation of conflicts), and operating decisions which concern the way in which program activities are carried out. Policy decisions typically represent high echelon determinations and operating decisions represent determinations at a lower level. Middle management individuals such as the dean of occupational/vocational education would appear to have duties which fall in all three decision categories--policy, managerial, and operating.[33]

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[32]Ibid., PP. 136-137.

[33]Marvin W. Peterson, "Decentralization, A Strategic Approach," Journal of Higher Education, 42, No. 6 (June, 1971), 529.

Such an analysis, Peterson pointed out, implied a definite line-of-authority system where an individual like the dean is in a vertical reporting linkage between the president or vice president and department chairmen. A person in such a position may be a coordinator; he seldom has final authority and often reports to someone with higher authority. Again, while an organizational chart and official responsibility analysis may indicate such a function for the dean, a group of strong professors and a weak dean may result in a situation where in reality the teachers may have more to say about evaluation and promotion than the dean.[34]

Koontz has contended that to be effective the college administrator must have the right to command. A job description for a key managerial type post such as dean must clearly note the authority the dean has. This authority must be couched in terms of responsibility since the word "authority" horrifies teachers. A dean may delegate these duties to others (such as associate deans) but the ultimate responsibility for success or failure in carrying out these duties must remain with him.[35].

Selznick (1961) wrote that a college administrator devotes most of his time to running the organization

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[34]Ibid., P. 532.

[35]Harold D. Koontz, "A Management Consultant Views Junior College Administration," Journal of Secondary Education, 36, No. 1 (January, 1961), 59.

efficiently, making routine decisions, directing meetings and working on the educational budget. But policy making and administration can meet, and what seems to be routine may affect the future of the organization. For example, one of the major responsibilities of a dean of occupational/ vocational education is the recruitment of teachers. If the goals of a college are clear, then the dean simply hires those who ascribe to the goals and objectives. It is a question of matching individuals whose values approximate those of the institution. In-service training, typically a responsibility of the dean, is crucial toward continuing to transmit these institutional goals. If goals are vague or changing, then the dean is determining educational policy by the type of person he is hiring. Selznick believed that the community college with its variety of student population was faced with a much more ambiguous goal determining situation than other colleges. But regardless of the clarity of goals, hiring of personnel which on the surface may seem to be of a routine operational nature, clearly affects the whole future of the college.[36]

A managerial description study was made by Langdale (1973) in which personnel interviewers were furnished with the exact information about a position to be filled (such as that provided by a detailed job description)

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[36]Phillip A. Selznich, "A Sociologist Views Junior College Administration," Journal of Secondary Education, 36, No. 1 (January 1, 1961), 35-36.

showed a much higher degree of inter-rater reliability on overall assessment of candidates, .87. When less specific information about a position was provided, they were in considerably more disagreement about the fitness of a candidate for a position.[37]

Implications of Literature for Study of Deans

Clearly, little research has been conducted on the use of job descriptions for community college supervisory posts and specifically on the position of dean of occupational/vocational education. The Administrative Leadership Service and writers such as Mehoney and Knezevich have indicated that the education profession has generally ignored job descriptions despite their obvious benefit to industry and government. Educational administration could make use of job descriptions which clearly delineate an employee's duties and through organizational charts and other relevant documents designate his authority position in the school's or college's structure.

Various authorities have claimed that an employee's position can be analyzed from the standpoint of the type of decisions that he makes in order to carry out his work.

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[37]John R. Langsdale and Joseph Weitz, "Estimating the Influence of Job Information in Interviewer Agreement," Journal of Applied Psychology, 57, No. 1 (February, 1973), 23-27.

It must be recognized that duties and responsibilities of the dean listed in the job descriptions will differ from document to document in terms of specificities, clarity and detail. If these duties are to be clear and accurate they should be geared toward the college's goals and the dean should be evaluated according to his success in carrying out these responsibilities. Job descriptions and organizational charts must be examined not only from a standpoint of freedom to make decisions to carry out duties but also from the standpoint of authority to delegate the tasks necessary to carry them out.

Categorizing, analyzing, and classifying the deans' duties may be accomplished by several different approaches as suggested by the literature. Some of these approaches are: (1) to develop a simple listing under a few functions such as curriculum, instruction, administration-liaison, communication, and committee participation, (2) to use such classifications as, planning, communicating, analyzing, deciding, organizing and leading, (3) to use types of decisions, i.e., policy decisions which concern the college's goal priorities, managerial allocation of resources among programs, and day-to-day decisions, and (4) to examine the dean from the viewpoint of tangible versus intangible duties, formal lines of authority versus informal lines of authority. Informal relationships would be revealed in the interviews or in evaluation forms which tend to emphasize

personal rather than performance criteria for the dean.

If there is a correlation between the dean's responsibilities, the college's goals, the evaluation forms and the organizational charts, the dean of instruction interviews should reveal a concept of their assigned work which is substantially identical with that indicated in their job descriptions. As has been noted, very little research has been accomplished on analyzing community college jobs and even less on the use of descriptions in community college administrative positions. However, several writers have attempted to define the dean's place in the college organization.

The College Dean as a Link Between Administration and Faculty

The dean can be viewed as the line officer most responsible for supervision of occupational/vocational instruction and curriculum on the individual campus. Although generally referred to as the dean of occupational/vocational education, he is sometimes termed as the vocational or technical dean. The vocational dean has been defined as that vocational supervisor directly responsible to the dean of instruction and the president of the college.

The Dean as Leader of the Faculty

Investigators have defined the dean as leader of a team. "Chairman of the Faculty" was the title Latta and Hartung found assigned to one dean in their survey, a title

which they believe was particularly appropriate for the community college dean.[38] This administrator, as seen by Gould (1968) would eliminate normal administrative chores and turn his full attention to the task of wielding college philosophy, objectives and personnel into an organism responsive to the "highest calling in which man is capable."[39]

This role of educational support to the junior college teacher should be one of primary emphasis for the junior college dean, according to investigators. For instance, Garrison contended that not only must the dean support the teacher, but he must also make clear to every faculty member the purposes toward which the college is striving.[40] Gould claimed that in order to supply true support for the faculty the dean needed: (1) to gain the confidence and respect of teachers, (2) to learn the nature of his job and character of its formal and informal organization, (3) to learn how

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[38]Michael Latta and Bruce A. Hartung, "The Junior College Dean, the Man and the Job," Junior College Journal, 41, No. 1 (August-September, 1970), P. 22.

[39]John W. Gould, "The Academic Deanship: A Summary and Perspective," in The Academic Deanship in American Colleges and Universities, ed. by Arthur J. Dibden (Carbondale: Peffer and Simon, Inc., 1968), P. 61.

[40]Roger H. Garrison, Effective Administration for Superior Teaching (Washington, D.C.: American Junior College Association, 1962), P. 519.

to change the status quo without upsetting useful elements therein, (4) to be objective, fairminded and college-wide in point of view, and (5) to divorce himself from the deadly paperwork, trivia, and routine.[41]

Criteria for an Effective Community College Dean

Many educators have attempted to define a dean of instruction by listing the qualities necessary for an effective dean. For example, a California community college faculty which had a major role in selecting the new dean of instruction developed the following criteria:

1. Teaching and administrative experience at the community college level with a significant leadership role.

2. Ability as an articulate spokesman in the field of higher education.

3. Commitment to the comprehensive community college concept.

4. Ability to interact with a wide range of students, faculty members and people in the community.

5. A sensitivity to the needs and feelings of others, including the ability to listen.

6. Ability to entertain new ideas and to get others to do likewise.

7. A doer, a person who is able to get the job done and not reluctant to actively participate.

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41 Gould, op. cit., p. 60.

8. A person with the courage of his own convictions and who can make difficult decisions when required and give the rationale in an effective manner.[42]

Add to this the high priority for the vocational dean to have the knowledge and experience in the vocational and technical areas necessary for curriculum development. As Perfumo (1981) found, high technology requires a higher level of training than any industry in the history of our country. This training requires not only basic education skills, but specific technical skills necessary to develop competence in employment.[43]

Most writers agreed that junior college instructional leaders must want responsibilities in three areas in order to be effective: instruction, curriculum and personnel administration. In order to determine whether the dean is effective in providing leadership in these areas Schultz suggested that a visiting accrediting team should seek answers to the following questions:

Instruction. Are the faculty qualified for their assigned duties? What provisions have been made for faculty professional growth? Is the faculty committed to the

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[42]"Qualification for the Dean of Instruction," Bakersfield Colleges Faculty Bulletin, Bakersfield, California, April, 1972.

[43]Paulette J. Perfumo. "The Impact of Diverse Economic, Educational and Political Constituencies on Vocational Educational Programs in California". Unpublished doctoral dissertation, University of California, Los Angeles. 1981. P. 1.

institution's purpose? Is balance and variety represented in the backgrounds of the faculty? How is the faculty organized for instructional purposes? Are faculty organized for instructional purposes? Are faculty loads conducive to qualify instruction? What means are employed to promote instructional improvements?

Curriculum. Do programs offered reflect that stated purpose of the institution? Does the curriculum reflect the admissions policy of the institution? Is there a clearly defined program of liberal arts? Is curriculum tightly organized? Are courses well organized? Is innovation encouraged?

Personnel Administration. What provisions are there for faculty involvement in policy formulation? Is there a written statement on academic freedom? Is there good faculty morale?[44]

In most of the existing literature the role of the junior college dean is primarily thought of as that of a staff officer working and coordinating faculty groups. Richardson, Blocker, and Bender (1972) felt that the twin developments of faculty militancy and student unrest in the 1960's formed a redefinition of community college administration, especially that involved in middle management

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[44]J. O. Carson and Raymond E. Schultz, "A Comparative Analysis of the Junior College Dean's Leadership Behavior," Journal of Experimental Education, 32, No. 4 (Summer, 1964), P. 320.

positions such as dean of instruction. In other words, the major impact of the transition from an authoritarian to participative structure of governance is experienced by community college deans as supervision and evaluation is diffused to department chairmen and faculty themselves.[45]

The same authors preferred to define the new community college dean as the "instructional services administrator" whose basic duties would involve the establishment of educational goals of the institution and leadership in the management of resources to implement these goals. The dean should have responsibilities for evaluation but should stimulate faculty and students to work together in the development of evaluation procedures that generate required information and maintain accountability.[46]

Such shared responsibility, according to Tillery (1969), means whole new styles of operation for the dean. "Increasingly," he explained, "we are seeing a flattening of the junior college administrational pyramid."[47] Schultz also observed that most deans were dissatisfied with their efforts toward instructional improvement and hypothesized that this failure was due to the fact that they did not

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[45]Richard G. Richardson, Clyde F. Blocker and Louis M. Bender, Governance of the 2 Year College (Englewood Cliffs, N.J.: Prentice Hall Inc., 1972), PP. 156-157.

[46]Ibid., P. 158.

involve the faculty in a significant way in the instructional improvement planning.[48]

Line and Staff Functions

Some writers believed that two individuals were needed in the broad area of junior college instructional supervision, a line officer and a staff officer. After surveying supervision of instruction in thirty-four large junior colleges in the nation, Quint (1965) concluded that relations of instructional development between the president, dean and department heads were not always clear and these positions too often ended up in tiers of line relationships; however, he noted "the persons responsible for the supervision of instruction will recognize the value of faculty participation in formulating board policy and administrative roles and organization." He stressed the importance of upward as well as downward communication in community college instructional supervision. Supervision was only justified through evidence of efficient learning by students as evaluated by administrators, faculty, students, lay persons, experts and accreditation committees.

Quint further suggested that one college official should have the basic responsibility for the administration of curriculum through department heads and the instructional

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[48]Schultz, op. cit., P. 320.

staff. Another individual should be strictly a staff officer, a coordinator of instruction. He should work with faculty groups in the improvement of instruction and curriculum innovation and have no evaluative powers.[49]

In looking at the community college of the future, Cohen viewed an instructional administrator as simply a coordinator of services, one who allocates resources and serves as an effective liaison with the community and insures that both internal and external communication lines are kept free. Final evaluation of the success of educational programs would be made by joint faculty teams.[50]

Writers generally concur that most community colleges will continue to have one chief instructional supervisor who will still have both line and staff functions. In a 1970 survey Kelley and Wilbur reported that community college instructors resented too much supervision, but felt that too little supervision indicated that the dean was neglecting his job and passing the buck to the faculty.[51]

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[49]Lewis Quint, "A Proposed Program of Supervision of Instruction in a Public Junior College: (unpublished doctoral dissertation, University of Pacific, 1965), PP. 7-10.

[50]Arthur M. Cohen, Dateline '79, Heretical Concepts for the Community College (Beverly Hills: Glencoe Press, 1969), PP. 38-39.

[51]Win D. Kelley and Leslie Wilbur, Teaching in the Community Junior Colleges (New York: Appleton-Century-Crofts, 1970), P. 391.

In a survey of seven hundred community college instructors on forty-two campuses Garrison discovered similar results; the faculty believed that "the dean's job was to create conditions where they could best teach, not to ask them to do his actual supervisory job. Faculty perceptions differed from the dean's perceptions: the faculty felt teaching loads were too great, the dean believed lightened loads meant less faculty work or more moonlighting.[52] Park's 1971 survey indicated that teacher misunderstanding of college policies could be corrected if faculty played a more active part in establishing curriculum policy; however, most stated that final personnel decisions should remain with instructional supervisors.[53]

Summary

Clearly the studies cited made almost no use of job descriptions and other official documents. Most investigation of the dean's duties are listed in terms of what ideally he should do in the opinion of the particular researcher. The categorizing and classifying of the dean's duties can only be accomplished after a careful analysis of official job descriptions and documents. Once this is accomplished,

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[52]Roger H. Garrison, Junior College Faculty, Issues and Problems (Washington, D.C.: American Association of Junior Colleges, 1970), PP. 8-10.

[53]Young Park. Junior College Faculty, Their Values and Perceptions. Los Angeles: ERIC Clearinghouse for Junior College Information, American Association of Junior Colleges, 1971. (Monograph No. 12.) P. 30.

trends should develop to better determine and identify the duties of the dean of occupational/vocational education in California community colleges.

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APPENDIX E

COMMUNITY COLLEGE VISITATIONS IN CALIFORNIA

COMMUNITY COLLEGE

1. Allan Hancock College - Santa Maria
2. American River College - Sacramento
3. Antelope Valley College - Lancaster
4. Bakersfield College - Bakersfield
5. Cerritos College - Norwalk
6. Chaffey College - Alta Loma
7. Citrus College - Azusa
8. Cosumnes River College - Sacramento
9. Evergreen Valley College - San Jose
10. Fresno City College - Fresno
11. Fullerton Jr. College - Fullerton
12. Golden West College - Huntington Beach
13. Laney College - Oakland
14. Long Beach City College - Long Beach
15. Los Angeles City College - Los Angeles
16. Los Angeles Pierce College - Woodland Hills
17. Los Angeles Trade - Technical College - Los Angeles
18. Merced College - Merced
19. Mission College - Santa Clara
20. Monterey Peninsula College - Monterey
21. Orange Coast College - Costa Mesa
22. Oxnard College - Oxnard
23. Pasadena City College - Pasadena
24. Rio Hondo College - Whittier
25. Riverside City College - Riverside
26. Sacramento City College - Sacramento

APPENDIX E

COMMUNITY COLLEGE VISITATIONS IN CALIFORNIA

COMMUNITY COLLEGE, PAGE TWO

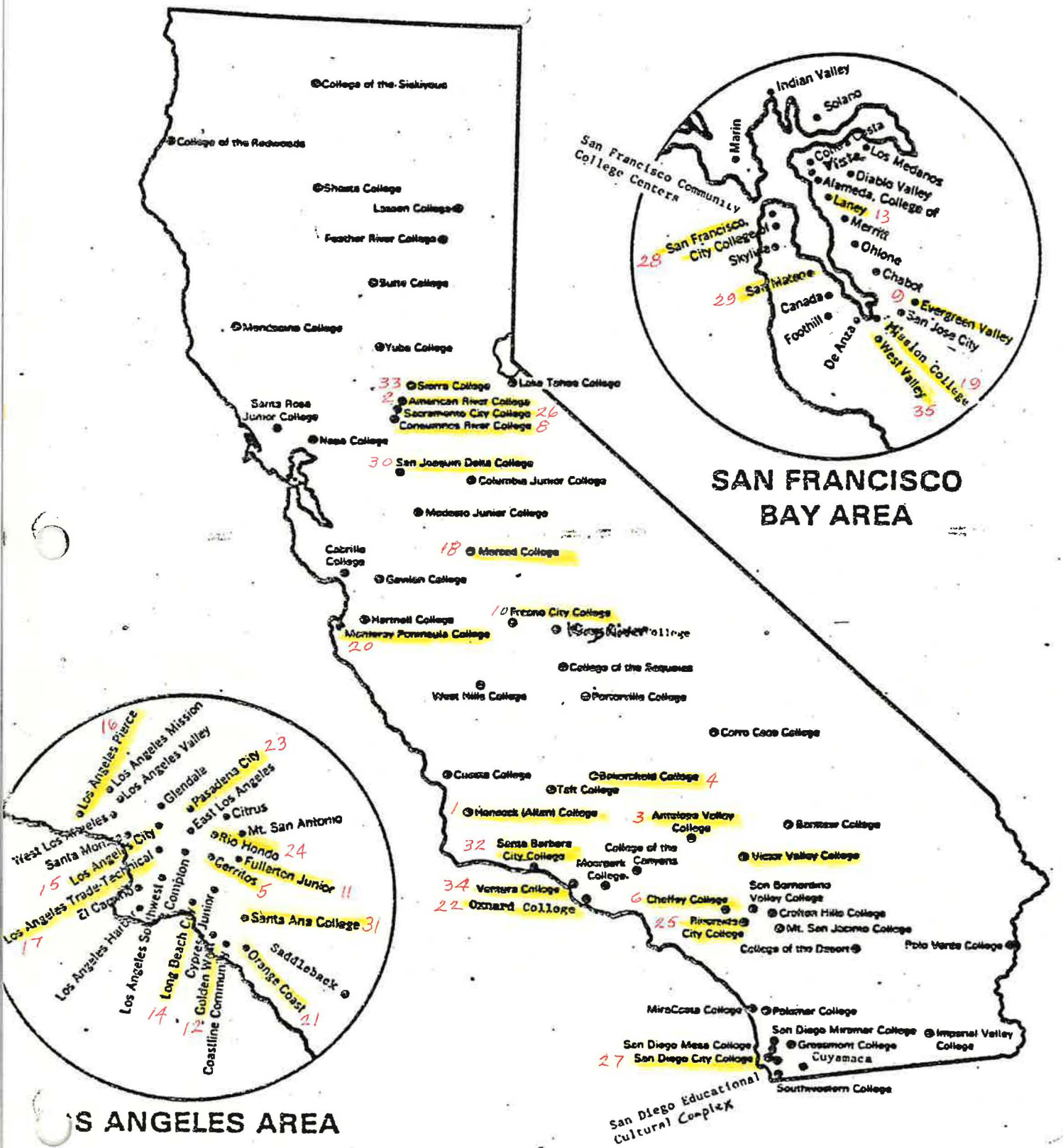
27. San Diego City College - San Diego
28. City College of San Francisco - San Francisco
29. College of San Mateo - San Mateo
30. San Joaquin Delta College - Stockton
31. Santa Ana College - Santa Ana
32. Santa Barbara City College - Santa Barbara
33. Sierra College - Rocklin
34. Ventura College - Ventura
35. West Valley College - Saratoga

APPENDIX -F

MAP OF CALIFORNIA ROUTES TAKEN

Keyed to Appendix - E

CALIFORNIA COMMUNITY COLLEGE CAMPUSES



APPENDIX G

UNIVERSITIES AND PRIVATE SCHOOLS VISITATIONS

UNIVERSITIES

1. San Francisco State University - San Francisco
2. Stanford University - Palo Alto
3. University of California - Berkeley
4. California Polytechnic State University - Pomona
5. University of California - Los Angeles
6. California State University - Fullerton
7. University of Southern California - Los Angeles

PRIVATE SCHOOLS

1. Bay View Technical Institute - Santa Clara
2. Lick Wimerding High School - San Francisco

APPENDIX H

COMMUNITY COLLEGE VISITATIONS OUTSIDE OF CALIFORNIA

1. Phonex College - Phoenix, Arizona
2. Pima Community College - Tucson, Arizona
3. El Paso County Community College - El Paso, Texas
4. San Antonio Jr. College - San Antonio, Texas
5. Community College of the Air Force - San Antonio, Texas - Lockland A.F.B.
6. Houston Community College - Houston, Texas
7. Oscar Rose Jr. College - Midwest City, Oklahoma
8. Tulsa Jr. College, Norwest Campus - Tulsa, Oklahoma
9. Mississippi-Gulf Coast Jr. College, Davis Campus - Gulfport, Mississippi
10. Mississippi-Gulf Coast Jr. College, Perkinston Campus - Perkinston, Miss.
11. Mississippi-Gulf Coast Jr. College - Keesler Center - Biloxi, Mississippi.
12. Gulf Coast Community College - Panama City, Florida
13. Hillsborough Community College - Tampa, Florida
14. St. Petersburg Jr. College - St. Petersburg, Florida
15. Miami-Dade Community College - Miami, Florida
16. Broward Community College - Ft. Lauderdale, Florida
17. Brevard Community College, Melbourne Campus - Melbourne, Florida
18. Brevard Community College, Cocoa Campus - Cocoa Beach, Florida
19. Brevard Community College, Titusville Campus - Titus, Florida
20. Mid-Florida Technical Institute - Orlando, Florida
21. Valdosta Area Vocational-Technical School - Valdosta, Georgia
22. Augusta Area Technical School - Augusta, Georgia
23. Fayetteville Technical Institute - Fayetteville, Georgia
24. Catwaba Valley Technical Institute - Hickory, North Carolina

APPENDIX H

COMMUNITY COLLEGE VISITATIONS OUTSIDE OF CALIFORNIA

PAGE TWO

25. Western Piedmont Community College - Morganton, North Carolina
26. North Carolina School for the Deaf - Morganton, North Carolina
27. Southwest Technical School - Sylvia, North Carolina
28. Walters State Community College - Morristonn, Tennessee
29. Norfolk State College - Norfolk, Virginia
30. Northern Virginia Community College - Annandale, Virginia
31. Prince Georges Community College - Lagro, Indiana
32. Montgomery College, Rockville Campus - Rockville, Maryland
33. Reading Area Community College - Reading, Pennsylvania
34. Westmoreland Community College - Youngwood, Pennsylvania
35. Henry Ford Community College - Dearborn, Michigan
36. Malcomb Community College - Warren, Michigan
37. St. Paul Vocational Institute - St. Paul, Minnesota
38. Minneapolis Technical Institute - Minneapolis, Minnesota
39. St. Cloud Area Vocational Institute - St. Cloud, Minnesota

APPENDIX - I

MAP OF UNITED STATES ROUTES TAKEN

Keyed to Appendix - H

APPENDIX J

UNIVERSITIES AND PRIVATE SCHOOL VISITATIONS

UNIVERSITIES

1. Nova University - Ft. Lauderdale, Florida
2. University of So. Florida - Tampa, Florida
3. Florida International University - Miami, Florida
4. Texas A & M University - College Station, Texas
5. Southern Methodist University - Dallas, Texas
6. Rice University - Houston, Texas
7. Texas Medical Center - Houston, Texas
8. Baylor School of Medicine - Houston, Texas
9. Northeastern Oklahoma State University - Tahlequah, Oklahoma
10. Arizona State University - Tucson, Arizona
11. Fayetteville State University - Fayetteville, North Carolina
12. Maryland University - College Park, Maryland
13. George Washington University - Washington, D. C.
14. University of Pittsburgh - Pittsburgh, Pennsylvania
15. University of Virginia - Charlottesville, Virginia
16. Tokyo Kogyo University - Tokyo, Japan

PRIVATE SCHOOLS

1. Phoenix Institute of Technology - Phoenix, Arizona
2. Maryland Drafting Institute - Langely Park, Maryland

APPENDIX- K

VISITS WITH COLLEGE DRAFTING TEACHERS

SCHOOL

TEACHER AGE

EDUCATION BS BA MS MA EdD Ph D

CREDENTIALS

VOCATIONAL ORGANIZATIONS AVA CIEA SME

AREA OF VOCATIONAL EXPERIENCE IN INDUSTRY

1- CLASSES TAUGHT

STUDENTS/CLASS NUMBER CLASSES

2- COMPUTER-AIDED DESIGN

NUMBER WORK STATIONS

SYSTEM

TEXT:

LABWORKBOOK:

VISUAL AIDS:

3- ELCTRIC DRAFTING

TEXT:

WORK BOOK:

VISUAL AIDS:

4- MECHANICAL DESIGN

BELTS COUPLINGS ETC.

TEXT:

VISUAL AIDS

5- GENERAL DRAFTING

APPENDIX -L

COMMUNITY COLLEGE CURRICULUM

COLLEGE	DEGREE	CERTIFICATE	CURRICULUM	PROGRAM
Anchorage C.C Alaska	3	10,11,12,13	B1, B2, A1, A2, A4	A,C,M,S
ElPaso C.C. Texas	3	None	B1,B2,A1,A2,A4,A6	A,M,C,S
Houston C.C. Texas	3	None	B1,B2,A1, A2, A3, A4, A5, A6.	A,M,C,S,P
Oscar Rose Jr.C. Okla.	2	11	B1,	M
Tulsa Jr. C. Okla.	2	11	B1, A5	M
Gulf Coast Jr,C. Miss.	3	None	B1,B2,A1,A2,A3,A5, A7.	A,M
Hillsborough C.C. Fla.	2	None	B1,B2,A1,A2,A3.	A,M
Gulf Coast C.C. Fla.	1	11	B1,B2, A1,A2,A3	A,M
Broward C.C. Fla.	2	None	B1,B2	A,C
Miami-Dade C.C. Fla.	2	10,11,12,13 14	B1,B2,A1,A2,A3, A4, A10	A,C,M,S.E.P
Brevard C.C. Fla.	2	None	B1, A1, A3	M
Western Piedmont C.C., N.C.	3	None	B1,B2,A1,A2,A3,A8	M
Southwest Tech. C. N.C.	3	None	B1,A1, A2, A3, A6	A,M
Catawaba Valley N.C.	3	None	B1,B2, A1, A2, A3, A6, A8	A,M,F
Walter State C.C. Tenn.	2	None	B1,B2,A1	A
Norfolk State U. Va.	2	None	B1,B2,A1,A2	A
Northern Va. Va.	3	None	B1,B2,A1,A2	A,M
Prince George C.C. Md.	1	10,11	B1,B2,A1,A2	A,M
Westmoreland C.C. Pa.	3	None	B1,B2,A1	M

APPENDIX -L

COMMUNITY COLLEGE CURRICULUM

COLLEGE	DEGREE	CERTIFICATE	CURRICULUM	PROGRAM
Henry Ford C.C. Mich.	2	10, 11	B1,B2,A1,A2,A4, A9	A,M
Macomb C.C. Mich.	3	10,11,12, 13,14	B1,B2,A1,A2,A3,A3, A4,A5,A6,A9	A,M,C,S,E
St.Paul Tech. Voc. Inst.	3	None	B1,B2,A1,A2,A3,A9	A,M

APPENDIX -L

COMMUNITY COLLEGE CURRICULUM

Key To Notations

Degrees Conferred

1- A.A. Associate of Arts Degree

2- A.S. Associate of Science Degree

3- A.A.S. Associate of Applied Science Degree

Basic Core Curriculum

B1 - Basic drafting skills, both technical and machine drafting.

B2 - Basic architecture, residential plans, light construction.

Advanced Curriculum

A1 - Advanced drafting skills, second semester technical and machine drafting.

A2 - Advanced architectural drawing, second semester architecture residential and commerical plans.

A3 - Electrical and/or Electronic drafting, commerical wiring, schematic drawing, wiring diagrams, printed circuit wiring.

A4 - Civil drafting, tract maps.

A5 - Piping design drawing, petrochemical drafting.

A6 - Structural drawing.

A7 - Marine drafting, shipbuilding.

A8 - Furniture design drafting.

A9 - Tool and die design drafting

A10 - Cartography, mapping

APPENDIX - L

COMMUNITY COLLEGE CURRICULUM

Key to Notations

Programs Offered

A - Architecture Technology , Architectural engineering.

C - Civil Engineering Technology.

E - Electrical/ Electronic Drafting Technology.

F - Furniture Design Technology

M - Mechanical Drafting Technology, Drafting and Design Technology.

P - Process Piping Design Technology.

S - Structural Design Technology.

APPENDIX - M

TRAVEL ITINERARY

College Visitations in California

	COMMUNITY COLLEGE
March 21.....	1. Allan Hancock College - Santa Maria
March 14.....	2. American River College - Sacramento
March 8.....	3. Antelope Valley College - Lancaster
March 9.....	4. Bakersfield College - Bakersfield
October 7.....	5. Cerritos College - Norwalk
October 6.....	6. Chaffey College - Alta Loma
October 6.....	7. Citrus College - Azusa
March 14.....	8. Cosumnes River College - Sacramento
March 17.....	9. Evergreen Valley College - San Jose
March 8.....	10. Fresno City College - Fresno
September 26....	11. Fullerton Jr. College - Fullerton
October 4.....	12. Golden West College - Huntington Beach
March 16.....	13. Laney College - Oakland
October 20.....	14. Long Beach City College - Long Beach
October 20.....	15. Los Angeles City College - Los Angeles
October 16.....	16. Los Angeles Pierce College - Woodland Hills
October 26.....	17. Los Angeles Trade - Technical College - Los Angeles
March 9.....	18. Merced College - Merced
March 17.....	19. Mission College - Santa Clara
March 20.....	20. Monterey Peninsula College - Monterey

APPENDIX - M

TRAVEL ITINERARY

College Visitations in California

COMMUNITY COLLEGE

October 4.....	21. Orange Coast College - Costa Mesa
March 22.....	22. Oxnard College - Oxnard
October 17.....	23. Pasadena City College - Pasadena
October 10.....	24. Rio Hondo College - Whittier
September 21....	25. Riverside City College - Riverside
March 15.....	26. Sacramento City College - Sacramento
September 20....	27. San Diego City College - San Diego
March 16.....	28. City College of San Francisco - San Francisco
March 17.....	29. College of San Mateo - San Mateo
March 9.....	30. San Joaquin Delta College - Stockton
October 4.....	31. Santa Ana College - Santa Ana
March 22.....	32. Santa Barbara City College - Santa Barbara
March 15.....	33. Sierra College - Rocklin
March 22.....	34. Ventura College - Ventura
March 17.....	35. West Valley College - Saratoga

APPENDIX - M

TRAVEL ITINERARY

Universities and Private School Visitations in California

UNIVERSITIES

March 16..... 1. San Francisco State University - San Francisco

March 17..... 2. Stanford University - Palo Alto

March 16..... 3. University of California - Berkeley

September 8..... 4. California Polytechnic State University - Pomona

September 19.... 5. University of California - Los Angeles

September 14.... 6. California State University - Fullerton

September 12.... 7. University of Southern California - Los Angeles

Nos. 4 to 7 repeated visits.

PRIVATE SCHOOLS

March 17..... 1. Bay View Technical Institute - Santa Clara

March 16..... 2. Lick Wimerding High School - San Francisco

APPENDIX -M

TRAVEL ITINERARY

Community College Visitations Outside of California

		COMMUNITY COLLEGE
April 14.....	1.	Phonex College - Phoenix, Arizona
April 15.....	2.	Pima Community College - Tucson, Arizona
April 15.....	3.	El Paso County Community College - El Paso, Texas
April 18.....	4.	San Antonio Jr. College - San Antonio, Texas
April 19.....	5.	Community College of the Air Force - San Antonio, Texas
April 20.....	6.	Houston Community College - Houston, Texas
April 22.....	7.	Oscar Rose Jr. College - Midwest City, Oklahoma
Nov.24 & Apr.26..	8.	Tulsa Jr. College, Norwest Campus - Tulsa, Oklahoma
April 28.....	9.	Mississippi-Gulf Coast Jr. College, Davis Campus - Gulfport, Mississippi
April 28.....	10.	Mississippi-Gulf Coast Jr. College, Perkinston Campus - Perkinston, Miss.
April 29.....	11.	Mississippi-Gulf Coast Jr. College - Keesler Center - Biloxi, Mississippi.
May 2.....	12.	Gulf Coast Community College - Panama City, Florida
May 4.....	13.	Hillsborough Community College - Tampa, Florida
May 4.....	14.	St. Petersburg Jr. College - St. Petersburg, Florida
May 6.....	15.	Miami-Dade Community College - Miami, Florida
May 9.....	16.	Broward Community College - Ft. Lauderdale, Florida

APPENDIX - M

TRAVEL ITINERARY

COMMUNITY COLLEGE VISITATIONS OUTSIDE OF CALIFORNIA

	Community College
May 11.....	17. Brevard Community College, Melbourne Campus - Melbourne, Florida
May 12.....	18. Brevard Community College, Cocoa Campus - Cocoa Beach, Florida
May 13.....	19. Brevard Community College, Titusville Campus - Titus, Florida
May 16.....	20. Mid-Florida Technical Institute - Orlando, Florida
May 18.....	21. Valdosta Area Vocational-Technical School - Valdosta, Georgia
May 20.....	22. Augusta Area Technical School - Augusta, Georgia
May 23.....	23. Fayetteville Technical Institute - Fayetteville, Georgia
May 24.....	24. Catwaba Valley Technical Institute - Hickory, North Carolina
May 26.....	25. Western Piedmont Community College - Morganton, North Carolina
May 26.....	26. North Carolina School for the Deaf - Morganton, North Carolina
May 27.....	27. Southwest Technical School - Sylvia, North Carolina
May 27.....	28. Walters State Community College - Morristonn, Tennessee
May 30.....	29. Norfolk State College - Norfolk, Virginia
May 31.....	30. Northern Virginia Community College - Annandale, Virginia
June 1.....	31. Prince Georges Community College - Lagro, Indiana
June 2.....	32. Montgomery College, Rockville Campus - Rockville, Maryland
June 3.....	33. Reading Area Community College - Reading, Pennsylvania
June 6.....	34. Westmoreland Community College - Youngwood, Pennsylvania
June 8.....	35. Henry Ford Community College - Dearborn, Michigan
June 8.....	36. Malcomb Community College - Warren, Michigan
June 10.....	37. St. Paul Vocational Institute - St. Paul, Minnesota
June 13.....	38. Minneapolis Technical Institute - Minneapolis, Minnesota
June 13.....	39. St. Cloud Area Vocational Institute - St. Cloud, Minnesota
April 5.....	40. Anchorage Community College - Anchorage, Alaska

APPENDIX - M

TRAVEL ITINERARY

Universities and Private School Visitations Outside California

UNIVERSITIES

June 9.....	1.	Nova University - Ft. Lauderdale, Florida
May 4.....	2.	University of So. Florida - Tampa, Florida
June 6.....	3.	Florida International University - Miami, Florida
April 21...	4.	Texas A & M University - College Station, Texas
April 21...	5.	Southern Methodist University - Dallas, Texas
April 20...	6.	Rice University - Houston, Texas
April 20...	7.	Texas Medical Center - Houston, Texas
April 20...	8.	Baylor School of Medicine - Houston, Texas
April 26...	9.	Northeastern Oklahoma State University - Tahlequah, Oklahoma
April 15...	10.	Arizona State University - Tucson, Arizona
May 23.....	11.	Fayetteville State University - Fayetteville, North Carolina
June 1.....	12.	Maryland University - College Park, Maryland
June 2.....	13.	George Washington University - Washington, D. C.
June 6.....	14.	University of Pittsburgh - Pittsburgh, Pennsylvania
May 30.....	15.	University of Virginia - Charlottesville, Virginia
April 11...	16.	Tokyo Kogyo University - Tokyo, Japan

PRIVATE SCHOOLS

April 14...	1.	Phoenix Institute of Technology - Phoenix, Arizona
June 2.....	2.	Maryland Drafting Institute - Langely Park, Maryland

APPENDIX - M

TRAVEL ITINERARY

Trip to Japan

March 29.....Depart California

April 3.....Depart Washington

April 5.....Depart Anchorage,Alaska

April 6.....Depart Kodena, Okinawa (Time change lost one day)

April 6.....Arrive Yokota, Japan

April 12.....Arrive in California

Seminars and Conferences

October 20-22.....California Association of Vocational Administrators (CAVA) - Ontario, Ca.

December 7-11.....Society of Mechanical Engineers (SME)- Los Angeles

Janurary 11-15....American Vocation Association (AVA)- Anaheim

March 9-10.....State Department of Education, Industrial Education Dept. AIDS Seminar - Bakersfield

March 11-13.....California Industrial Education Association, (CEIA) - Bakersfield

◆65 Electr[illegible] Drafting—Packaging (2) [w]

Two hours lecture.
One hour laboratory.
Prerequisite: Electronics Drafting - Schematics 60 or a knowledge of schematic drawings.

An advanced drafting course designed to give students a functional background in the field of electronics packaging and miniaturization. The content of this course will be a series of graded informational and working drawings as applied to the packaging of electronic components. Emphasis is placed on professional techniques required by industry.

◆66A, 66B, 66C Advanced Architectural Drafting (3-3-3) [w]

Two hours lecture.
Four hours laboratory.
Prerequisite: 66A — Architectural Drafting 55A & 55B or equivalent educational or industrial experience.
66B — Advanced Architectural Drafting 66A.
66C — Advanced Architectural Drafting 66A or 66B.

A study of architectural nomenclature as applied to the layout and design of commercial and industrial buildings. Projects will consist of preliminary layouts, floor plans, elevations, construction details, structural sections and connections, framing details, and perspective renderings and sketches. A portfolio of all course projects is required. This portfolio will contain the complete construction drawings featuring three (3) types of main materials: brick masonry, concrete block, and tilt-up construction. This sequence of courses is equivalent to Advanced Architectural Drafting 56A-56B.

70 Technical Descriptive Geometry (2) [w]

One hour lecture.
Three hours laboratory.
Prerequisite: Technical Drawing 21A or equivalent.

This is a basic course in descriptive geometry which applies the principles of orthographic projection to point, line, plane, auxiliary views, intersection, and development problems encountered in various fields of drafting and design.

74 Civil Engineering Drafting (2) [w]

One hour lecture.
Three hours laboratory.
Prerequisite: Technical Drawing 21A or equivalent.

A study of methods used for layout and drafting of civil engineering projects. Projects will consist of subdivision layout, tract layout, interpretation of surveyor's data, study of contours, drafting of sewers, gutters, surface drainage, using and interpreting civil engineer's calculations.

75 Smoley's Tables (3) [w]

Three hours lecture.
Prerequisite: Technical Mathematics 70A-70B or equivalent.

This course provides an introduction to industrial practices in problem solving for architectural, civil, piping, sheetmetal, structural draftsmen and designers by use of Smoley's Tables.

76A-76B Structural Drafting (2-2) [w]

One hour lecture.
Three hours laboratory.
Prerequisite: Introduction to Technical Drawing 20 or Technical Drawing 21A or equivalent.

A study of methods used for layout and drafting of structural forms. Projects will consist of detailing, drawing commercial and industrial structures, and using and interpreting structural engineering calculations as applied to drawings.

82 Specifications and Building Codes (3) CSUC [v]
Semester Fall and Spring

Three hours lecture.
Prerequisite: Architectural Drafting 55A or equivalent experience.

A study of the form and content of specifications used in architecture and code requirements pertaining to construction and basic knowledge and understanding of building codes.

◆90 Introduction to Drafting and Sketching (1) CSUC [v]

One hour lecture.
Two hours laboratory.

This course includes freehand sketching and the following subjects: lettering; use of scales; projection; multi-views; oblique, isometric, and perspective sketching; sectional views; auxiliary views; symbols and conventions; revolution.

◆91 Environmental Design Process Technology (2) [w]

One hour lecture.
Three hours laboratory.

Introduction to theory and principles of applied environmental design. Communication process for development of design criteria applicable to disciplines of architecture, urban design, urban planning, and civil engineering. Recommended for Architectural and Civil Engineering Technology majors. A project portfolio is required for this course.

95, 96, 97, 98 Work Experience in Drafting (1-2-3-4) [w]
(May be taken for Pass/No Pass only.)
(May be taken four times for credit)

Prerequisite: Compliance with Work Experience regulations as designated in Section IV of this bulletin.

This course is designed to combine actual job experience in drafting and design with related classroom instruction. This work experience may be during a regular semester or during a summer session on the Alternate Semester Plan. Ninety clock hours of supervised work is required for each one unit of credit.

(714) 594-5611
EXT. 4809

MT. SAN ANTONIO
COMMUNITY COLLEGE DISTRICT
1100 NORTH GRAND AVENUE • WALNUT, CALIFORNIA 91789

HERMAN L. BUSHONG, JR.
INSTRUCTOR, DRAFTING AND DESIGN

20550 SETON HILL DR.
WALNUT, CA 91789
(714) 595-1197

◆50 Airbr[illegible] Techniques (3) [w]

Two hours lecture.
Four hours laboratory.
Prerequisite: Knowledge of basic drafting. Student must obtain airbrush of acceptable type.

This course is designed to give a working knowledge of the operation and maintenance of the airbrush. Use of light and shadow in retouching and rendering. Practical application in defining gray scale from pure white to solid black. Illustrated lectures and practical applications in retouching and rendering basic and semi-complex shapes.

51A-51B Technical Drafting (8-8) [w]

Five hours lecture.
Ten hours laboratory.
Prerequisite: Introduction to Technical Drawing 20 or Technical Drawing 21A; and Technical Drawing 21B (or equivalent educational or industrial experience); and Machine Tool Processes 90-91 (or equivalent), may be taken concurrently.

A study of industrial drafting including mechanical drafting review, intersections and developments, descriptive geometry, detail and assembly working drawings, government and industrial design specifications and standards, dimensioning, surface finish, tolerance and draft room procedures. Specialized areas of drafting may be selected during advanced training.

53 Elements of Mechanical Design (2) CSUC [v]

One hour lecture.
Three hours laboratory.
Prerequisite: Technical Drawing 21A or equivalent.

A study of design and drafting procedures relating to the basic elements of mechanisms. Includes studies of related terminology, power transmission, bearings, and mechanical devices. Related problems include design layouts, details, and assembly drawings. A portfolio of completed drawings is a project requirement for this course.

54 Architectural Materials (3) [w]

Three hours lecture.

Introduction to properties of materials used in construction. Includes: masonry, concrete, wood, steel and other metals, plaster, plastics, ceramics, and protective coverings.

55A-55B Architectural Drafting (3-3) Year CSUC [v]

Two hours lecture.
Four hours laboratory.
Prerequisite: One year of mechanical drafting in high school or one semester in college. 55A is prerequisite to 55B.

A study of architectural nomenclature as applied to the layout and design of frame buildings. Projects will consist of foundation details, floor plans, framing details, elevations, plot plans, and perspective renderings or sketches. A portfolio of completed drawings is a project requirement of this course.

56A-56B Advanced Architectural Drafting (5-5) CSUC [v]

Three hours lecture.
Six hours laboratory.
Prerequisite: Architectural Drafting 55A-55B or equivalent industrial experience. Advanced Architectural Drafting 56A is prerequisite to 56B.

A study of architectural nomenclature as applied to the layout and design of commercial and industrial buildings. Projects will consist of preliminary layouts, floorplans, elevations, construction details, structural connections, framing details, building of models, and perspective renderings and sketches. A portfolio of completed drawings is a project requirement fo[illegible] course.

◆58 Blueprint Reading and Shop Mathematics (3) [w]

Three hours lecture.

A study of standard drafting room practices as applied to industrial drawings with emphasis on orthographic and auxiliary projection as well as isometric sketching. Group discussions on shop drawings will include projections, the meaning and interpretation of shop symbols, and the application of simple calculations for unknown dimensions.

◆59A-59B Drafting Techniques (2-2) [w]

Two hours lecture.
One hour laboratory.
Prerequisite: Drafting Techniques 59A is prerequisite to 59B.

A course in drafting room practices conforming to military standards and military specifications as required by aero-space industry. Includes the use of drafting instruments; interpretation and application of symbols and tolerances; basic fundamentals of orthographic projection including auxiliary, section and revolution views; working drawings for detail parts, assemblies and schematics.

60 Electronics Drafting-Schematics (2) Semester Fall and Spring [w]

One hour lecture.
Three hours laboratory.
Prerequisite: Technical Drawing 21A; or equivalent educational or industrial experience.

An advanced drafting course planned particularly for those who have had basic drafting techniques, consisting of a series of graded projects on working drawings as applied to electronic and electro-mechanical phases of engineering. Stress is made on professional techniques which are required by industry with emphasis on special symbols, circuitry, printed circuitry, miniaturization, servo-mechanism, instrumentation, etc.

◆61A-61B Applied Mechanical Drawing (1-1) [w]

Three hours laboratory.
Prerequisite: Applied Mechanical Drawing 61A is prerequisite to 61B.

Orthographic projection, lettering, drafting instrument techniques, auxiliary views, and principles of revolution. Drafting room techniques and procedures as practiced in typical aircraft engineering department, including engineering change control, military and commercial standards, and application of military specifications.

◆62A-62B Introduction to Tool Design (4-4) (w)

Three hours lecture.
Three hours laboratory.
Prerequisite: Mechanical Drafting, a knowledge of algebra, geometry and trigonometry. 62A is a prerequisite to 62B.

A study of the fundmental practices of assembly tool design in relation to basic typical tools such as drill jigs, assembly jigs, installation fixtures, tooling templates, and tooling masters. Each laboratory session will be devoted to actual design practice and each lecture will cover the related processes and technical information necessary to design tools.

63A-63B Technical Illustration (2-2) CSUC [v]

One hour lecture.
Three hours laboratory.
Prerequisite: Technical Drawing 21A; or equivalent educational or industrial experience. Technical Illustration 63A is prerequisite to 63B.

This course consists of laboratory and lectures on modern industrial technical illustration. Topics included will be isometric, dimetric, oblique, and perspective drawing. Emphasis on production illustration as it pertains to manufacturing, engineering, interior sketches, and architectural renderings. Techniques in the use of ink, charcoal, pencil, watercolor, and airbrush are included as well as reproduction and visu[illegible]ids. A portfolio of completed drawings is a project requirement of this course.

CIVIL AND STRUCTURAL DRAFTING CERTIFICATE

equired Courses: (units)
Technical Drawing 21B — (2)
Architectural Drafting 55A — (3)
Architectural Drafting 55B — (3)
Smoley's Tables 75 — (3)
Structural Drafting 76A-76B — (2-2)
Technical Descriptive Geometry 70 — (2)
Civil Engineering Drafting 74 — (2)

estricted Electives: (Three courses required)
Architectural Materials 54 — (3)
Construction Estimating 71 — (3)
Specification Writing 72 — (3)
Uniform Building Codes 73 — (3)
Machine Calculations 53 — (2)
Technical Illustration 63A — (2)
Technical Illustration 63B — (2)
Industrial Physics 65 — (3)
Technical Mathematics 70B — (3)

ELECTRO-MECHANICAL DRAFTING AND DESIGN CERTIFICATE

equired Courses: (13 units)
Technical Drawing 21B — (2)
Elements of Mechanical Design 53 — (2)
Survey of Electronics 90 — (3)
Electronics Drafting-Schematics 60 — (2)
Electronics Packaging-Design 65 — (2)
Technical Descriptive Geometry 70 — (2)

estricted Electives: (Three courses required)
Industrial Materials and Processes 50 — (3)
Techniques of Report Writing 119 — (3)
Introduction to Physics 1 — (4)
Basic Metallurgy 51 — (3)
Mechanical Design Through Shortcuts 60A — (3)
Mechanical Design Through Shortcuts 60B — (3)
Mechanical Design Through Shortcuts 60C — (3)
Mechanical Design Through Shortcuts 60D — (3)
Machine Tool Processes 90-90L — (1-1), or
Basic Machinist and Review 60A — (3), or
Basic Machinist and Review 60B — (3)
Machine Tool Processes 91-91L — (1-1), or
Basic Machinist and Review 60B — (3), or
Basic Machinist and Review 60A — (3)
Machine Calculations 53 — (2)
Technical Illustration 63A — (2)
Technical Illustration 63B — (2)
Technical Mathematics 70B — (3)

MECHANICAL DRAFTING AND DESIGN CERTIFICATE

quired Courses: (12 units)
Technical Drawing 21B — (2)
Elements of Mechanical Design 53 — (2)

Machine Tool Processes 90-90L — (1-1), or
Basic Machinist and Review 60A — (3), or
Basic Machinist and Review 60B — (3)
Drafting Techniques 59A — (2)
Drafting Techniques 59B — (2)
Technical Descriptive Geometry 70 — (2)

Restricted Electives: (Three courses required)
Survey of Electronics 90 — (3)
Industrial Materials and Processes 50 — (3)
Tool Design 62A — (4)
Tool Design 62B — (4)
Machine Tool Processes 91-91L — (1-1), or
Basic Machinist and Review 60B — (3), or
Basic Machinist and Review 60A — (3)
Techniques of Report Writing 119 — (3)
Electronics Packaging-Design 65 — (2)
Introduction to Physics 1 — (4), or Industrial Physics 65 — (3)
Basic Metallurgy 51 — (3)
Machine Calculations 53 — (2)
Mechanical Design Through Shortcuts 60A — (3)
Mechanical Design Through Shortcuts 60B — (3)
Mechanical Design Through Shortcuts 60C — (3)
Mechanical Design Through Shortcuts 60D — (3)
Technical Illustration 63A — (2)
Technical Illustration 63B — (2)
Technical Mathematics 70B — (3)

Drafting Course Descriptions

DRAFTING AND DESIGN

20 Introduction to Technical Drawing (3) CSUC [v]

Two hours lecture.
Four hours laboratory.

Develops basic drafting skills and the principles involved in technical drawing. Includes lettering, sketching, geometric construction, multiview projection, sectioning, primary auxiliary views, and secondary auxiliary views.

21A Technical Drawing (2) Semester CSUC [v]

One hour lecture.
Three hours laboratory.
Prerequisite: One or two years of recent high school drafting or related industrial experience. (Students without previous experience should take Introduction to Technical Drawing 20.)

This course provides basic drafting techniques for industrial technicians and technical drafting and design majors. It includes instrument drawing, geometric construction, sketching, multi-view sectioning, and auxiliary projection.

21B Technical Drawing (3) Semester CSUC [v]

Two hours lecture.
Four hours laboratory.
Prerequisite: Technical Drawing 21A or Introduction to Technical Drawing 20 or equivalent recent training or industrial experience.
Corequisite: None required. Machinist course and/or Technical Mathematics recommended.

The course is a study of size description as applied to working drawings for shop use. Also all requirements for complete sets of drawings, dimensioning, tolerancing, use of fasteners (screws, pins, etc.) are involved. Types of pictorial drawings are studied.

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DRAFTING TECHNOLOGY

ARCHITECTURAL DRAFTING TECHNOLOGY

This program of study is designed for those students who desire to work in professional architectural drafting and allied fields of construction. Successful completion of the curriculum qualifies the graduate for employment with an architect, a building designer, a building contractor, a civil or structural engineer, or, in City, County, or State Construction and/or Planning Departments.

Required Courses:

Architectural Drafting 55A-55B; Advanced Architectural Drafting 56A-56B; Architectural Materials 54; Construction Estimating 71; Technical Descriptive Geometry 70; and Technical Mathematics 70B; (*See note); Specifications and Building Codes 82 (Total Units 30).

*Students who have had math through applied trigonometry are exempt from taking Technical Mathematics 70B.

Recommended Electives:

Civil (Engineering) Drafting 74; Smoley's Tables 75; Technical Illustration 63A-63B; Structural Drafting 76A-76B; Elements of Mechanical Design 53; Surveying AE 5; Industrial Physics 65, and Introduction to Labor-Management Problems 50.

Optional Electives:

Chemistry 53; Machine Calculations 53; Introduction to Business 20; and Physics 1 (in lieu of Industrial Physics 65).

INDUSTRIAL DRAFTING TECHNOLOGY

This curriculum is recommended for students who wish to become professional draftsmen, or technicians in fields related to engineering work. The course of study provides a fundamental knowledge of manufacturing processes as related to design problems and the techniques required by industry for making detail and assembly working drawings. Drafting experience may be gained in the following: aerospace, civil, electronics, structural steel, technical illustration, tool design, piping, and sheet metal layout.

Required Courses:

Technical Drawing 21A-21B*; Technical Drafting 51A-51B; Technical Mathematics 70A-70B; Machine Tool Processes 90-90L; Machine Tool Processes 91-91L; Elements of Mechanical Design 53; and Technical Descriptive Geometry 70. (Total Units 37)

*Technical Drawing 20 may be substituted for Technical Drawing 21A.

Recommended Electives:

Structural Drafting 76A-76B; Civil (Engineering) Drafting 74; Smoley's Tables 75; Technical Illustration 63A-63B; Survey of Electronics 90; Electronic Drafting (Schematics) 60; Industrial Physics 65; Chemistry 53; Surveying AE55; Introduction to Engineering 48; Introduction to Business 20; Machine Calculations 53; Introduction to Labor-Management Problems 50; *Industrial Materials and Processes 50; and *Basic Metallurgy 51.

*Indicates courses offered in the Continuing Education only.

Certificate Programs In Drafting

Students entering these programs are expected to be proficient in applied algebra and trigonometry. Those students who are deficient in these subjects are advised to take the course Technical Mathematics 70A-70B. Technical Drawing 21A or equivalent and Introduction to Drafting and Sketching 90 or equivalent are prerequisites to these certificate programs.

ARCHITECTURAL DRAFTING CERTIFICATE

Required Courses: (20 or 21 units)

Architectural Drafting 55A — (3)
Architectural Drafting 55B — (3)
Advanced Architectural Drafting 56A — (5)*
Advanced Architectural Drafting 56B — (5)*
Technical Descriptive Geometry 70 — (2)
Architectural Materials 54 — (3)

Restricted Electives: (Three courses required)

Construction Estimating 71 — (3)
Specification Writing 72 — (3)
Uniform Building Codes 73 — (3)
Machine Calculations 53 — (2)
Technical Drawing 21B — (2)
Technical Illustration 63A — (2)
Technical Illustration 63B — (2)
Smoley's Tables 75 — (3)
Structural Drafting 76A-76B — (2)
Civil Engineering Drafting 74 — (2)
Technical Mathematics 70B — (3)

*Advanced Architectural Drafting 66A, 66B, and 66C — (3 units each, offered in Continuing Education only) are equivalent to Advanced Architectural Drafting 56A and 56B.

APPENDIX -O

MATERIALS COLLECTED

Course Outlines

1- Industrial Drafting Technology, Henry Ford C.C.,Michigan

2- Drafting and Design Technology, Mississippi Gulf Coast Jr.C., Miss.

3- Architectural and Engineering Drafting Degree, Anchorage C.C., Alaska

4- Architectural Interiors, City College of San Francisco, Calif.

5- Electronic Drafting, Bay-Valley Technical School, Santa Clara, Calif.

6- Architectural Construction Technology, Henry Ford C.C., Michigan

7- Engineering Drafting Certificate Program, Allan Handcock College, Ca.

8- Drafting Technology/Tool and Design Program, Malcomb C.C., Michigan

9- Integrating CAD/CAM in Drafting/Design Associate Degree Program, Malcomb C.C., Michigan

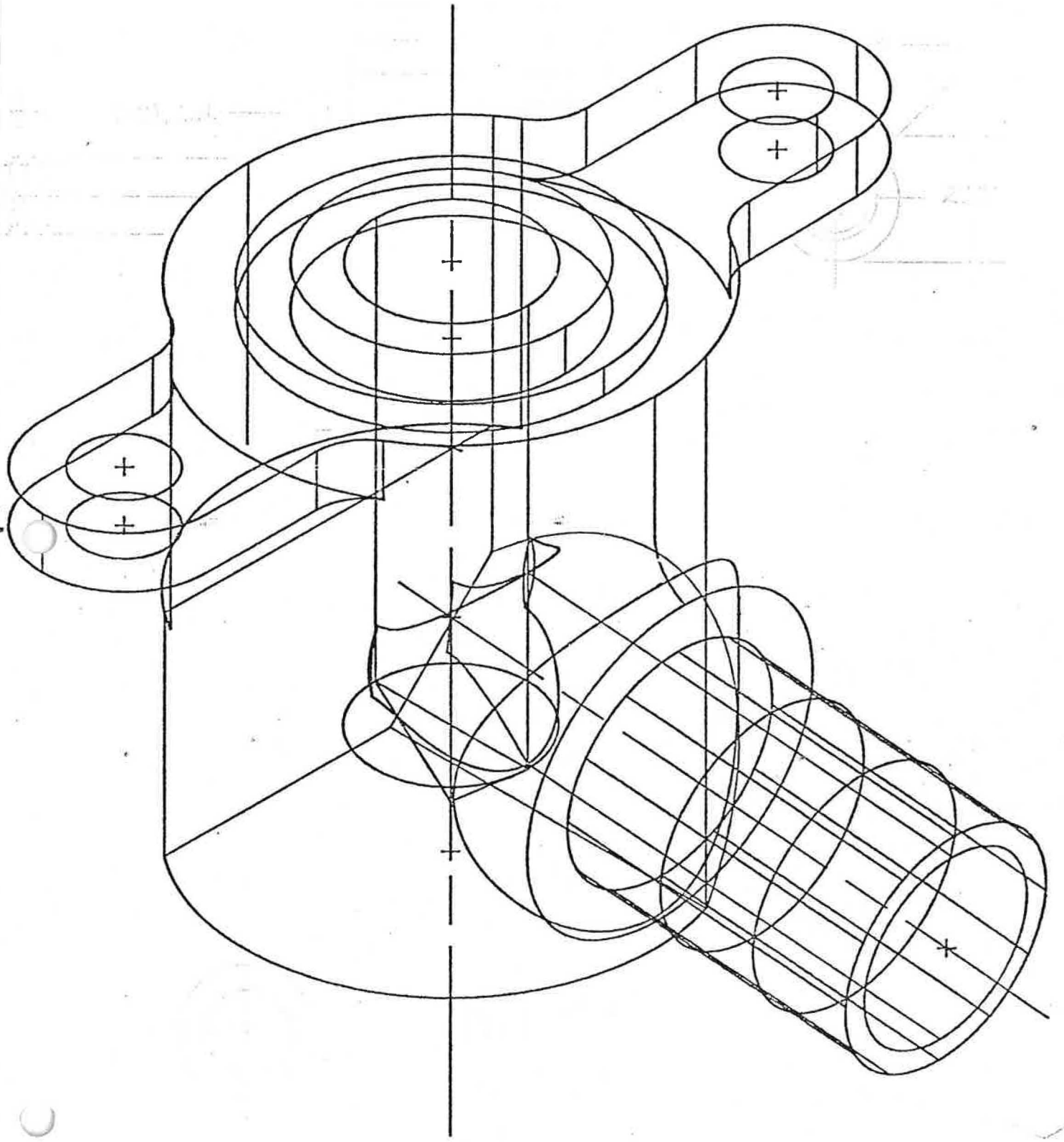
10-Architectural Technology, Miami-Dade C.C., Flordia

11- Electrical- Electronic Technology, Henry Ford C.C., Michigan

12- The Visiting Engineer Program, Engineer Design Graphics Dept., Texas A&M University, Texas

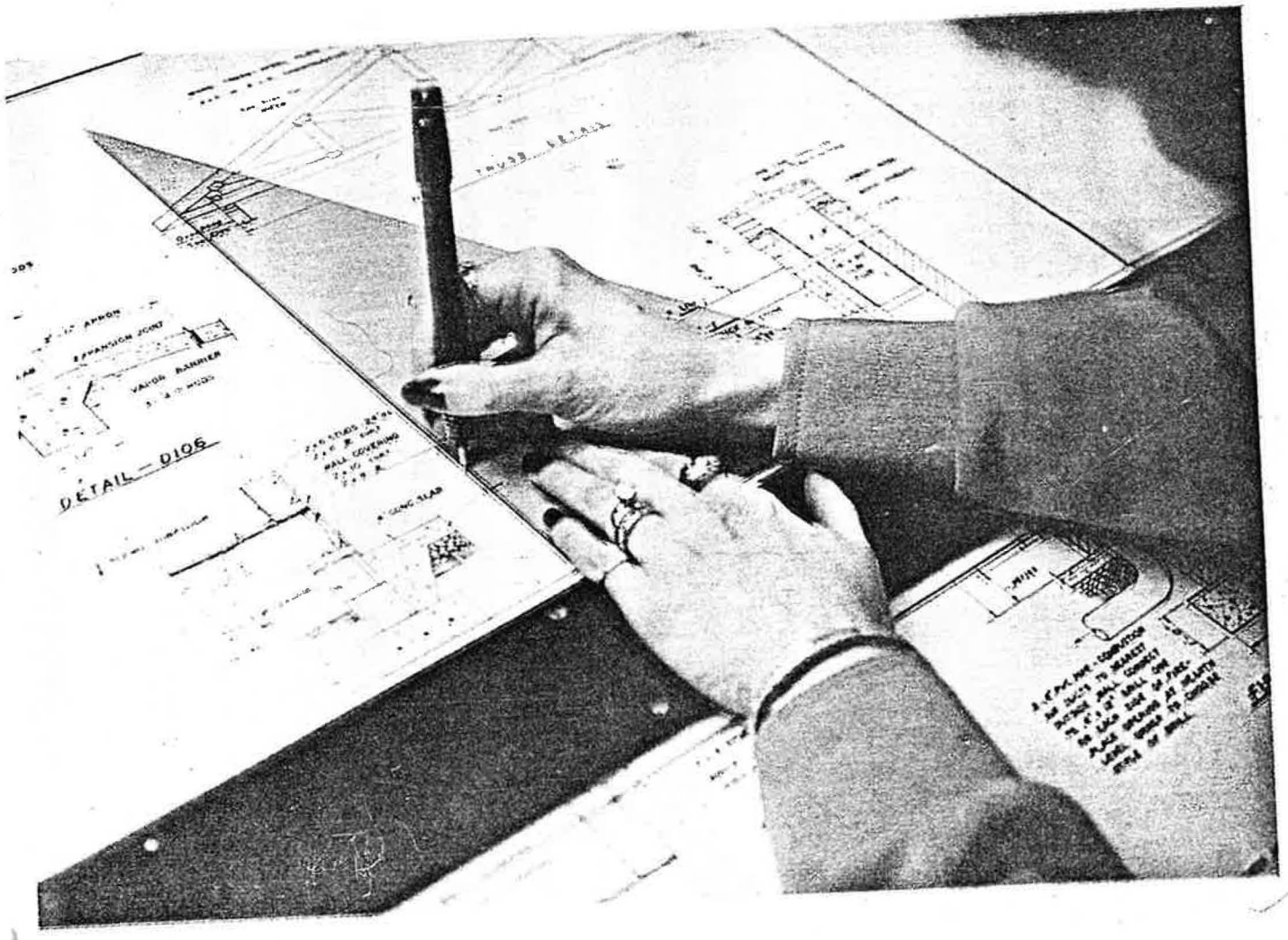
Industrial Drafting Technology

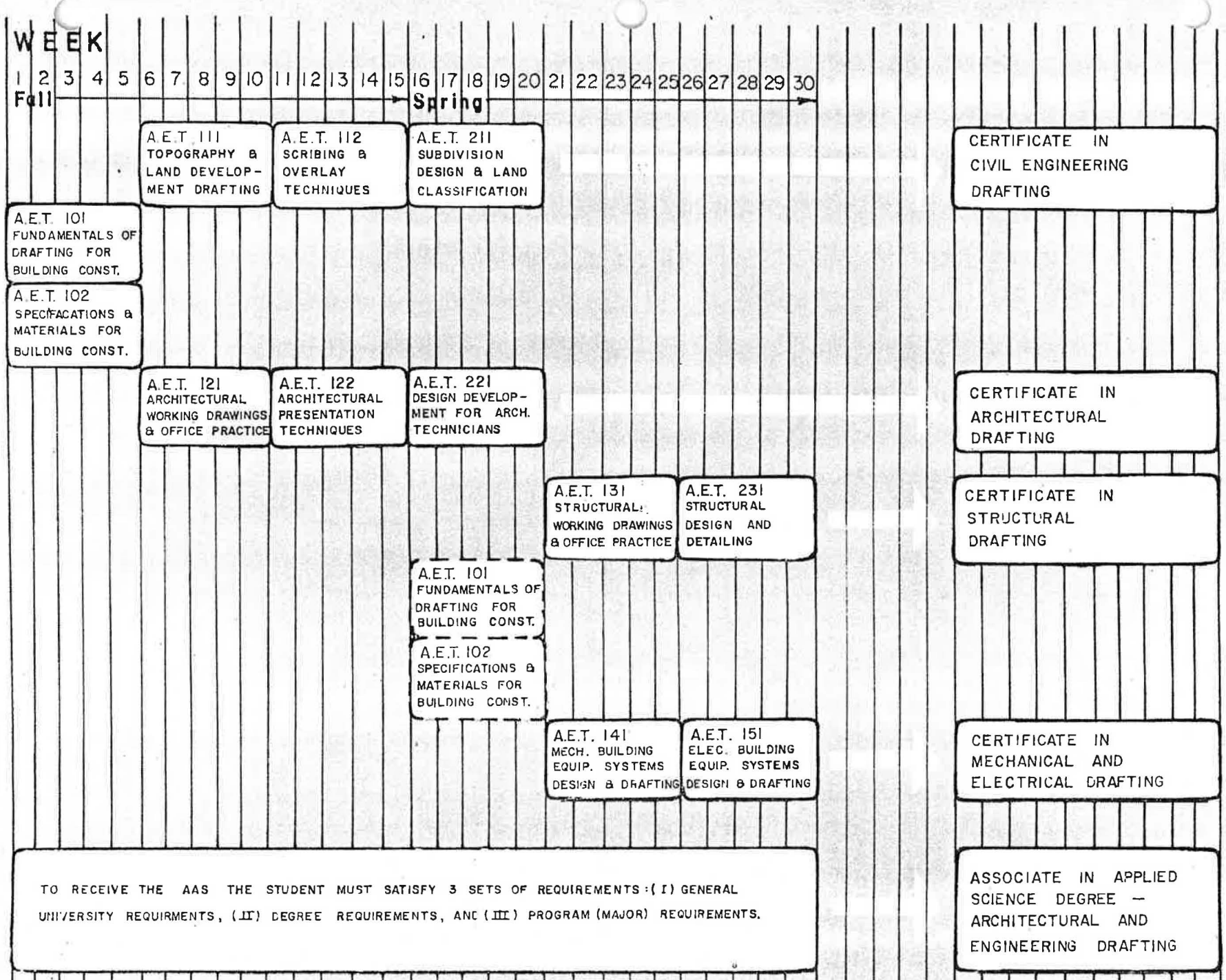
Henry Ford Community College



MISSISSIPPI
GULF COAST JUNIOR COLLEGE

Drafting and Design Technology





ARCHITECTURAL AND ENGINEERING DRAFTING DEGREE AND CERTIFICATION REQUIREMENTS

CITY COLLEGE OF SAN FRANCISCO

ARCHITECTURAL INTERIORS

THE CAREER FOR YOU?

Those who satisfactorily complete the two-year course of study are qualified for employment in interior design offices, furniture design, sales (wholesale and retail), display and exhibit design, fabric design, etc.

EMPLOYMENT OPPORTUNITIES

Opportunities are numerous, since San Francisco is the leading center for design in the Western United States. CCSF works closely with professional groups and organizations related to interior design, furniture and fabric design and sales.

PERSONAL QUALIFICATION

- Maturity
- Resourcefulness
- Ability to work well with others
- Creative awareness

HIGH SCHOOL PREREQUISITES

General high school subjects with emphasis on all art courses, especially freehand drawing and sketching and typing.

WHO MAY ENROLL

Any interested student.

LENGTH OF TRAINING

Two years

COSTS

No tuition fees for legal residents of San Francisco. Students must purchase their textbooks and the necessary drawing equipment and supplies for their courses. This cost is approximately $75.00 per semester.

COURSE OF STUDY

GENERAL EDUCATION

Social Science
Humanities
Natural Science
Physical Education
Health Education
Learning Skills

SPECIALIZED INSTRUCTION IN THE FOLLOWING

Architectural design
Creative drawing
Architectural drafting
Perspective and Shades and Shadows
Basic Design
Art History
Materials of Construction
Graphic Design
Basic Textiles
Professional Practice/Interior Design
Architectural Rendering and Delineation

CERTIFICATION

Associate in Science Degree

(Continued on Page 2)

ELECTRONIC DRAFTING

WARNING

A Diploma or Certificate of Completion can be issued ONLY upon submitting a minimum of the attached drawings and passing the Electronics Drafting and Theory Test.

All 3rd Term students will be required to read and follow the instructions and attend all lecture. Drafting lectures will include P.C.B. Design, Layouts, Tape Ups and artwork, Component Layouts, Fab Drawings, and Drafting Standrds according to Ansi Standards, Design, Taping, and General Drafting in the Field Today.

WEEK	TEXT	PAGE	PROJECT
1	Electronics Workbook	36 38	PCB-1 PCB-2
2	Electronics Workbook	41 44	PCB-3 PCB-4
3	Electronics Workbook	48	PCB-5
4	Electronics Workbook	51	PCB-6
5	Electronics Workbook	55 57	EMD-1 EMD-2
6	Electronics Workbook	59 60 63	EMD-3 EMD-4 WD-2
7	Electronics Workbook	66	P-1
8	Electronics Workbook	72 73 74 75	IC-1 IC-2 IC-3 IC-4
9	Electronics Workbook		
10	Electronics Workbook		
11-13	SPECIAL HANDOUT		

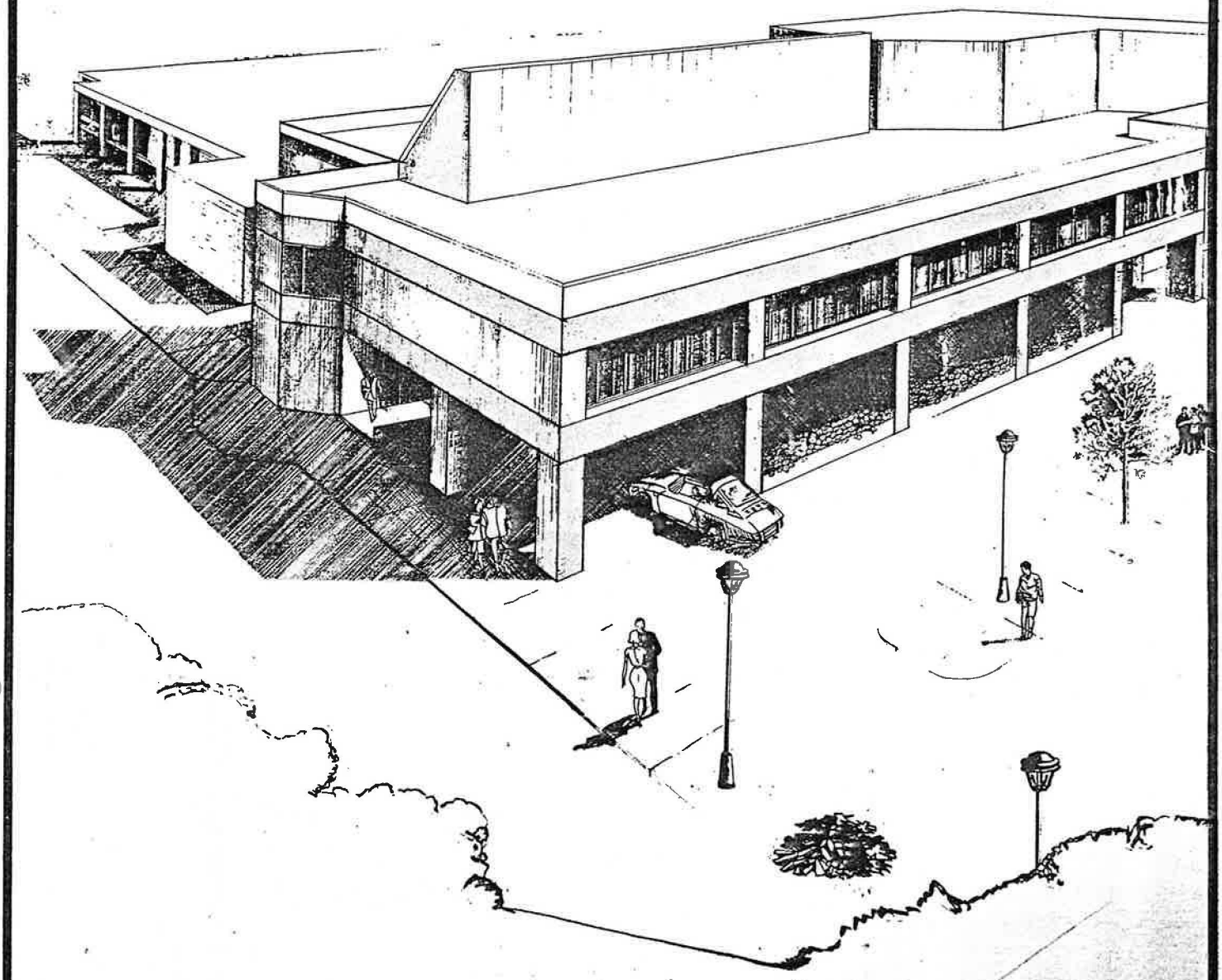
bay-valley tech

2550 SCOTT BOULEVARD
SANTA CLARA, CALIFORNIA 95050

(408) 727-1060

Architectural Construction Technology

Henry Ford Community College



ALLAN HANCOCK COLLEGE

Associate in Science Degrees

ENGINEERING

REMINDER: All courses used in the major must be taken for letter grade.

ENGINEERING

A minimum of 24 units constitutes the major.

COURSE NUMBER	TITLE	UNITS
Chem 150	General Chemistry	5
Enrg 141	Engineering Design Graphics	4
or		
Engr 146	Engineering Drawing	2
Engr 152	Statics	3
Engr 161	Materials Science	3
Math 152	Calculus with Analytic Geometry	4
Physics 151	Engineering Physics	4
Physics 152	Engineering Physics	4
or		
Physics 153	Engineering Physics	4

ENGINEERING TECHNOLOGY

A minimum or 25 units from the list below constitutes the major.

COURSE NUMBER	TITLE	UNITS
Chem 150	General Chemistry	5
Engr 141	Engineering Design Graphics	4
or		
Engr 146	Engineering Drawing	2
Engr 152	Statics	3
Engr 161	Materials Science	3
Math 152	Calculus with Analytic Geometry	4
Physics 140	General Physics	3
Physics 141	General Physics Laboratory	1
Physics 142	General Physics	3
Physics 143	General Physics Laboratory	1

CIVIL ENGINEERING TECHNOLOGY

A minimum of 30 units from the list below constitutes the major.

COURSE NUMBER	TITLE	UNITS
Arch 131	Materials of Construction	3
DT 111	Technical Drawing	3
DT 112	Technical Drawing	3
Engr 100	Orientation and Problem Solving	2
Engr 152	Statics	3
Engr 161	Materials Science	3
Engr 162	Materials Science Laboratory	1
Engr 121	Surveying	2
Engr 122	Surveying Laboratory	1
Engr 123	Surveying	2
Engr 124	Surveying Laboratory	1
Geol 150	Physical Geology	4
Math 131	Trigonometry	3
Math 111	Algebra 2	3
Math 151	Calculus with Analytic Geometry	4
Physics 140	General Physics	3
Physics 141	General Physics Laboratory	1
Physics 142	General Physics	3
Physics 143	General Physics Laboratory	1

ENGINEERING DRAFTING (CERTIFICATE)

(SEE SEPARATE SHEET FOR INSTRUCTIONS FOR APPLYING FOR CERTIFICATE)

COURSE NUMBER	TITLE	UNITS
DT 311	Mechanical Drawing	3
Engr 146	Engr. Graphics	2
Engr 121 & 122	Surveying	3
Arch 131	Materials of Construction 1	3
DT 389	Special Problems	2
DT 330	Print Reading and Interpretation	2

DRAFTING TECHNOLOGY/TOOL AND DIE DESIGN PROGRAM

INDIVIDUAL TRAINING PLAN

NAME _____

SCHOOL _____ CLASS CODE _____

		Method of Delivery	Points Possible	Points Earned
*I.	INTRODUCTION - REVIEW OF COMPETENCIES (10 pts.)			
	The student will demonstrate ability to apply knowledge and perform skills used in Tool & Die Design.			
	1. ANSI	C	2	
	2. MIL Spec	C	1	
	3. Technical Math	C	4	
	4. Machinery's Handbook	C	2	
	5. Industrial Organizations	C	1	
*II.	TECHNICAL MATHEMATICS - REVIEW AND TEST FOR COMPETENCY (4 pts.)	C/L	4	
	The student will demonstrate competence in:			
	1. Geometry			
	2. Trigenometry			
	3. Tolerance Calculation			
*III.	WORKING DRAWINGS AND CONVENTIONS (247 pts.)			
	The student will communicate all the information necessary for the construction of a product through a set of working drawings:			
	1. Complete Set Of Working Drawings:	c/L	40	

	Sketch	Layout	Detail	Bill of Material
	10	10	10	10

2. Design & Draw:	Sketch	Layout	Detail	Bill of Material			
Jigs	5	5	10	10	_____	30	_____
Fixtures	10	10	16	10	_____	46	_____
Inspection Tools	10	10	16	10	_____	46	_____
Gauges	5	5	10	10	_____	30	_____
3. Build Model/Prototype Jigs and Fixtures:							
Fabricate Jig					_____	10	_____
Fabricate Fixture					_____	10	_____
Inspect Jig & Fixture					_____	5	_____
4. Design and Build Mock-Up Dies							
Design Mock-Up Die					_____	10	_____
Fabricate Parts					_____	10	_____
Assemble Parts					_____	10	_____

INTEGRATING CAD/CAM IN DRAFTING/DESIGN ASSOCIATE DEGREE PROGRAMS

Abstract

Macomb Community College has integrated CAD into two of its Drafting/Design Programs: The Auto Body Design Program and the Fixture & Die Design Program. Four other programs are being revised to include CAD: Architectural, Special Machine, Technical Illustration and Materials Handling. This integration is achieved by having a separated CAD course as a companion to each Drafting/Design course, i.e. 10 such courses and programs are given as well as the outlining of future plans that include interaction with MCC's Numerical Control and Robotics Programs.

Authors

Jack W. Thompson
Professor, Engineering Design Technology
Macomb Community College
Warren, Michigan

and

Norm Abell, Ed.D.
Associate Dean, Technology
Macomb Community College
Warren, Michigan

MIAMI-DADE COMMUNITY COLLEGE

ARCHITECTURAL TECHNOLOGY (53)
ASSOCIATE IN SCIENCE

THIS CURRICULUM OFFERS COURSES THAT ENABLE THE STUDENT TO TRANSLATE THE DESIGN AND SYSTEMS OF THE ARCHITECT INTO GRAPHIC AND WRITTEN FORM AND ASSISTS THE PROFESSIONAL IN RENDERING ARCHITECTURAL SERVICES. THE ATTAINMENT OF THESE SKILLS QUALIFIES THE STUDENT FOR SEVERAL SPECIALTIES, SUCH AS, ARCHITECTURAL DRAFTING, COST ESTIMATING, MATERIAL SELECTING, SPECIFICATION WRITING, AND PREPARING PRESENTATION DRAWING AND MODELS. THE GRADUATE OF THIS PROGRAM MAY ALSO TRANSFER TO FLORICA INTERNATIONAL UNIVERSITY AS A JUNIOR IN ARCHITECTURAL TECHNOLOGY OR CONSTRUCTION MANAGEMENT. (MANY OTHER UNIVERSITIES ALSO ACCEPT GRADUATES AT THE JUNIOR LEVEL.)

	COURSE	COURSE TITLE	CREDITS	PRE/CO-REQUISITES
	MAJOR COURSE REQUIREMENTS- 54 CREDITS REQUIRED			
	(SELECT THE FOLLOWING COURSES)			
+	ARC 1126	ARCH DRAWING 1	4	PRRQ BCN1251 OR 1 YR HIGH SCHOOL ARCH DRAFTING
+	ARC 1115	ARCH COMMUN 1	4	
	ARC 2780	HIST ARCHITECTURE 1	3	
	ARC 2781	HIST ARCHITECTURE 2	3	
+	ARC 2461	ARCH MAT CONST 1	4	PRRQ ARC1126 OR BCN1251
+	ARC 1471	ARCH DRAWING 2	4	PRRQ BCN1251 OR ARC1126
	ARC 1131	ARCH COMMUN 2	4	PRRQ ARC1115
+	ARC 2462	ARCH MAT CONST 2	3	PRRQ ARC2461
+	BCN 2760	BLDG CODE REGULATION	3	
+	ARC 2681	ENVIRONMENTAL TECH	3	
+	ARC 2472	ARCH DRAWING 3	4	PRRQ ARC1471
	BCN 1750	BLDG CONST FINANCE	3	
	BCN 1610	BLDG CONST EST FUND	3	
	O R			
	BCN 1721	BLDG CONST PLAN COST	3	
	BCN 1740	BLDG CONST LAW	3	
	MTB 1321	TECH MATHEMATICS 1	3	
	MTB 1322	TECH MATHEMATICS 2	3	PRRQ MTB1321 W/'C'
	COMMUNICATIONS- 3 CREDITS REQUIRED			
	(SELECT THE FOLLOWING COURSE)			
	ENC 1131	COMMUNICATIONS	3	
	HUMANITIES- 3 CREDITS REQUIRED			
	(SELECT THE FOLLOWING COURSE)			
	HUM 1020	HUMANITIES	3	
	SOCIAL ENVIRONMENT- 3 CREDITS REQUIRED			
	(SELECT THE FOLLOWING COURSE)			
	SSI 1120	SOCIAL ENVIRONMENT	3	
	NATURAL ENVIRONMENT- 3 CREDITS REQUIRED			
	(SELECT THE FOLLOWING COURSE)			
	PSC 1515	ENERGY/NAT ENVIRON	3	
	INDIVIDUAL/HEALTH ANALYSIS- 2 CREDITS REQUIRED			
	(SELECT FROM THE FOLLOWING COURSES)			
	DEP 1106	INDIV IN TRANSITION	3	
	O R			
	HLP 1010	HLTH ANALYSIS/IMPROV	2	

MINIMUM TOTAL CREDITS REQUIRED FOR ASSOCIATE IN SCIENCE DEGREE IS 68.

CCAA APPROVED/REVISED 9/81

STUDENTS SHOULD CHECK THEIR INDIVICUALIZED AGIS REPORT TO DETERMINE THE SPECIFIC GRADUATION POLICIES IN EFFECT FOR THEIR PROGRAM OF STUDY FOR THE YEAR AND TERM THEY ENTERED MIAMI-DADE. THIS OUTLINE INCLUDES ONLY ACTIVE COURSES AND CURRENT GRADUATION REQUIREMENTS.

STUDENTS WHO INTEND TO TRANSFER TO A FLORIDA STATE UNIVERSITY MUST TAKE THE COLLEGE LEVEL ACADEMIC SKILLS TEST (CLAST) IN ORDER TO BE ELIGIBLE TO ENROLL IN THE UPPER DIVISION BEGINNING JANUARY, 1983.

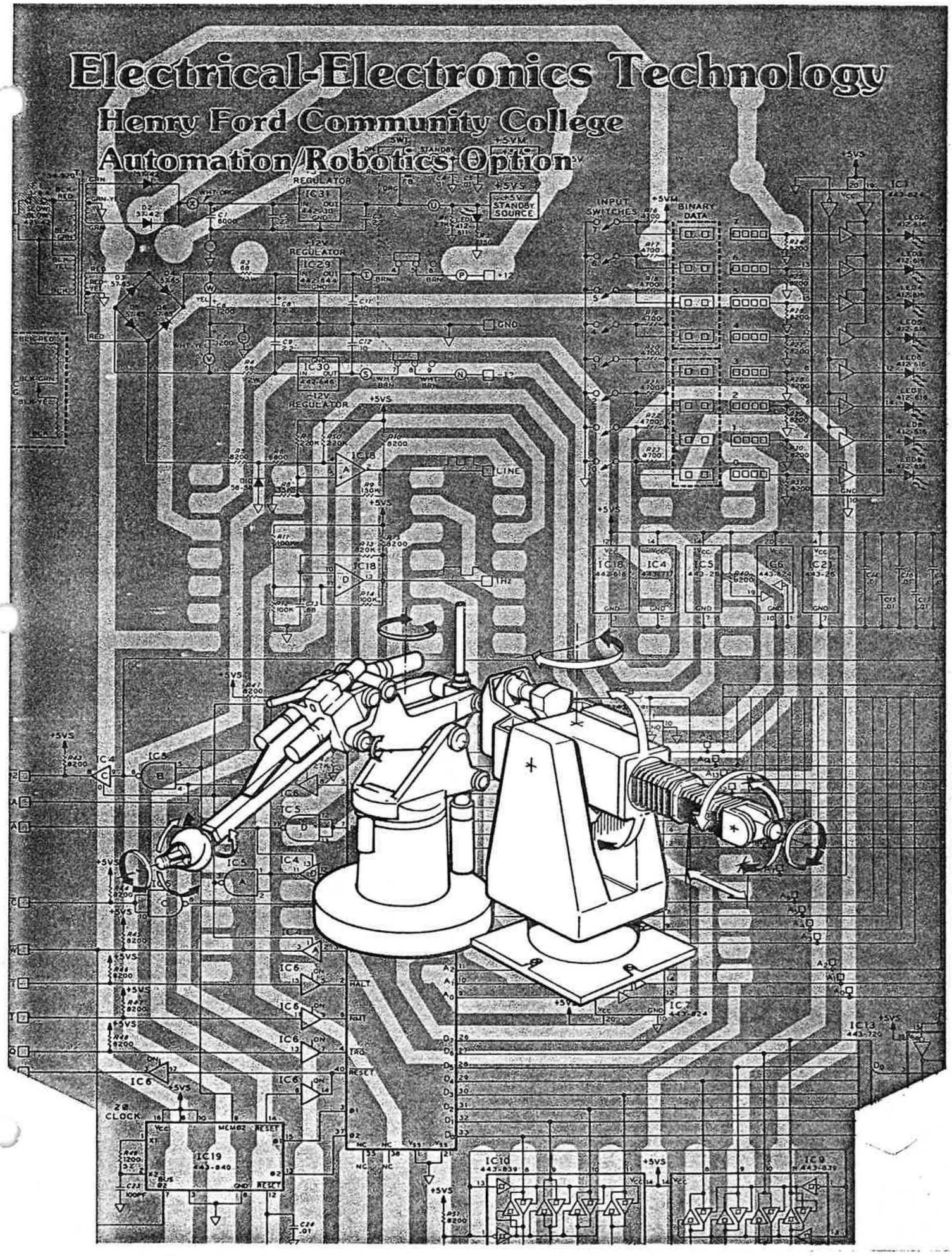
+ PLANNED CERTIFICATE PROGRAM IN ARCHITECTURAL DRAFTING (AR) - TOTAL CREDITS REQUIRED IS 29.

DATE PRINTED MAY 19, 1982

Electrical-Electronics Technology

Henry Ford Community College

Automation/Robotics Option



THE VISITING ENGINEER PROGRAM

engineering design graphics department

texas a&m university

APPENDIX - O

MATERIALS COLLECTED

Student Hand-Outs

1- Tolerancing, Orange Coast C.C, Calif.

2- Architectural Check-List for Floor Plans, Gulf Coast C.C., Miss.

3- Exploded Assembly, College of San Mateo, Calif.

4- Dimensioning, Evergreen Valley College, Calif.

5- Engineering Order, Evergreen Valley college, Calif.

6- Piping Ststems, Drafting & Design, Sierra College, Calif.

7- Architectural Technology- Residental Competency Based Tasks, Mid-Flordia Technical Institute, Fla.

8- Drafting & Design Time Card, Valdosa Area Vocational Technical Inst., Georgia

9- Title Block, Long Beach C.C., Calif

10- Decimal Equivalents & Tap Drill Sizes, Santa Ana College, Calif.

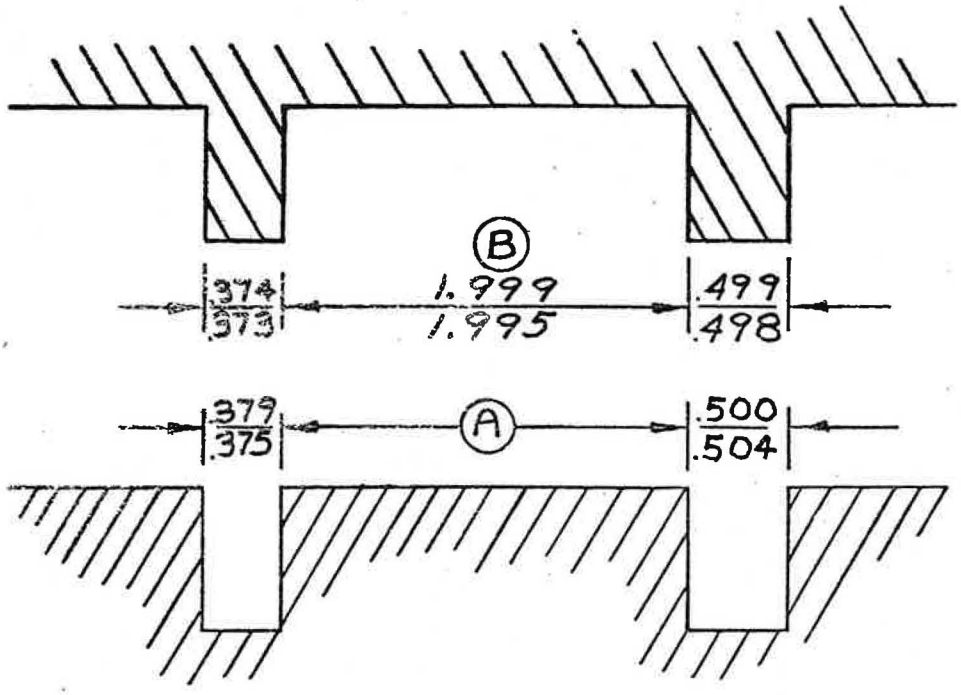
11- Furniture Design, Catawaba Valley Technical School, North Carolina

12- Designing for Impact & Fatique, St. Paul Vocational Institute, Minn.

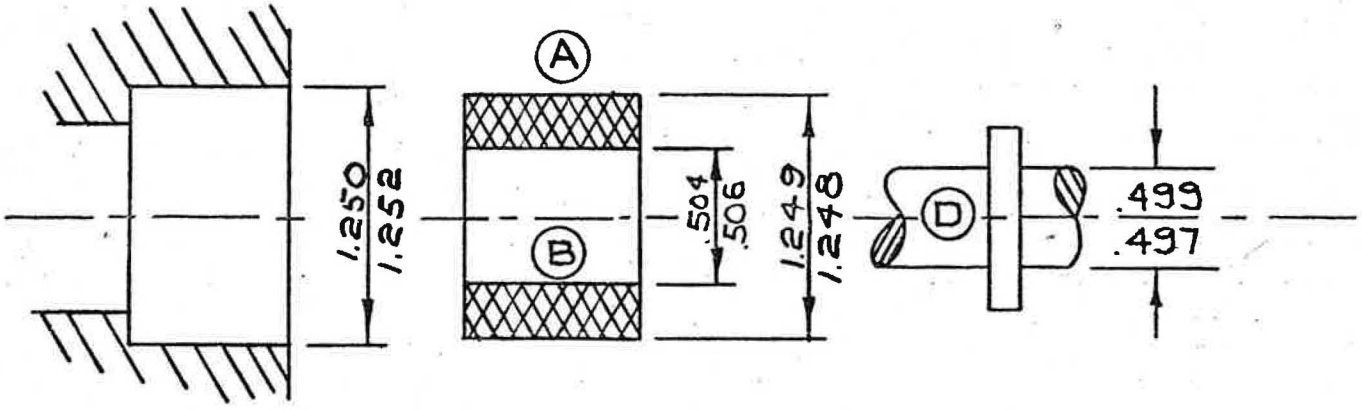
13- Schematic Layout, Phonex College, Arizona

14- Light and Shade, El Paso C.C., Texas

15- Title, Section and Detail Symbols, Prince George C.C., Maryland



"B" WAS ARBITRARILY DIMENSIONED. WITH THESE DIMENSION AT "B", CAN A DIMENSION BE GIVEN AT "A" & THE PARTS ASSEMBLED? IF NOT & RETAINING 1.999 AT "B", GIVE THE DIMENSIONS AT BOTH "A" & "B".



WHAT MUST BE THE CONCENTRICITY CALLOUT T.I.R. BETWEEN CYLINDRICAL SURFACE 'A' & 'B' SO THAT SHAFT 'D' WILL HAVE ZERO CLEARANCE OF 'B'.

ORANGE COAST COLLEGE

NAME

SECTION

CHECK LIST FOR FLOOR PLAN

_____ 1. Outline of outside walls & nominal thickness.

_____ 2. Outline of partition walls & nominal thickness.

_____ 3. Outline of patio.

_____ 4. Indicate roof out line (long, broken line).

_____ 5. Indicate window openings.

_____ 6. Indicate door opening with swings.

_____ 7. Indicate porches & stoops.

_____ 8. Outline fireplace & chimneys with flues indicated.

_____ 9. Indicate stairs with number & sizes of treads and risers, Show directional arrow.

_____ 10. Indicate stairwell with hand rail.

_____ 11. Indicate kitchen with sink, cabinets & major appliances.

_____ 12. Indicate baths with showing vanities, storage areas and plumbing fixtures, medicine cabinets & mirrors.

_____ 13. Indicate laundry with washer, dryer & work areas called out.

_____ 14. Indicate closet poles and shelves.

_____ 15. Indicate all other built in features.

_____ 16. Write in room names with approximate room sizes.

_____ 17. Indicate steps from grade and garage into house.

_____ 18. Indicate other items; such as furnace, air handler, water pump, compressor, ventilating fans, etc.

_____ 19. Indicate soil pipes & hose bibs.

_____ 20. Call out window & door symbols.

_____ 21. Indicate & call out extent or change in flooring material in each room.

_____ 22. Dimensioning:

A. Dimension from ℄ window to nearest wall.
B. Dimension from ℄ of interior wall to ℄ of interior wall & ℄ of interior wall to face of sheathing on exterior wall.
C. Dimension over all.

_____ 23. Indicate arches and cased openings - broken line.

_____ 24. Indicate girder on I beam with proper symbol and call out size.

_____ 25. Indicate type & size of heating units in each room if not part of a central heating system.

_____ 26. Indicate garage drain.

_____ 27. Use arrows to indicate entrances.

_____ 28. Indicate where sections and details have been taken with proper symbol.

_____ 29. Use correct symbol hatching for materials.

_____ 30. Indicate scale.

COLLEGE OF SAN MATEO
TECHNOLOGY DIVISION
DRAFTING 202

TOPIC: EXPLODED ASSEMBLY

OBJECTIVE: To show all parts of the arbor press clearly and to indicate how they fit together.

MATERIALS REQUIRED: One 22 x 34 work tracing sheet for planning and one sheet of 20 x 30 illustration board.

INSTRUCTIONS:

1. Block out an exploded mechanical axonometric sketch on tracing sheet at full scale of the proposed assembly based on the suggestion given in the class lecture. Scale dimensions from that shown on the handout.

2. Plan the arrangement and location of the views carefully on the layout sheet with an eye to correcting any irregularities when transferring to illustration board.

3. Rub the back surface of the tracing with a soft pencil lead. Place the tracing sheet on the illustration board.

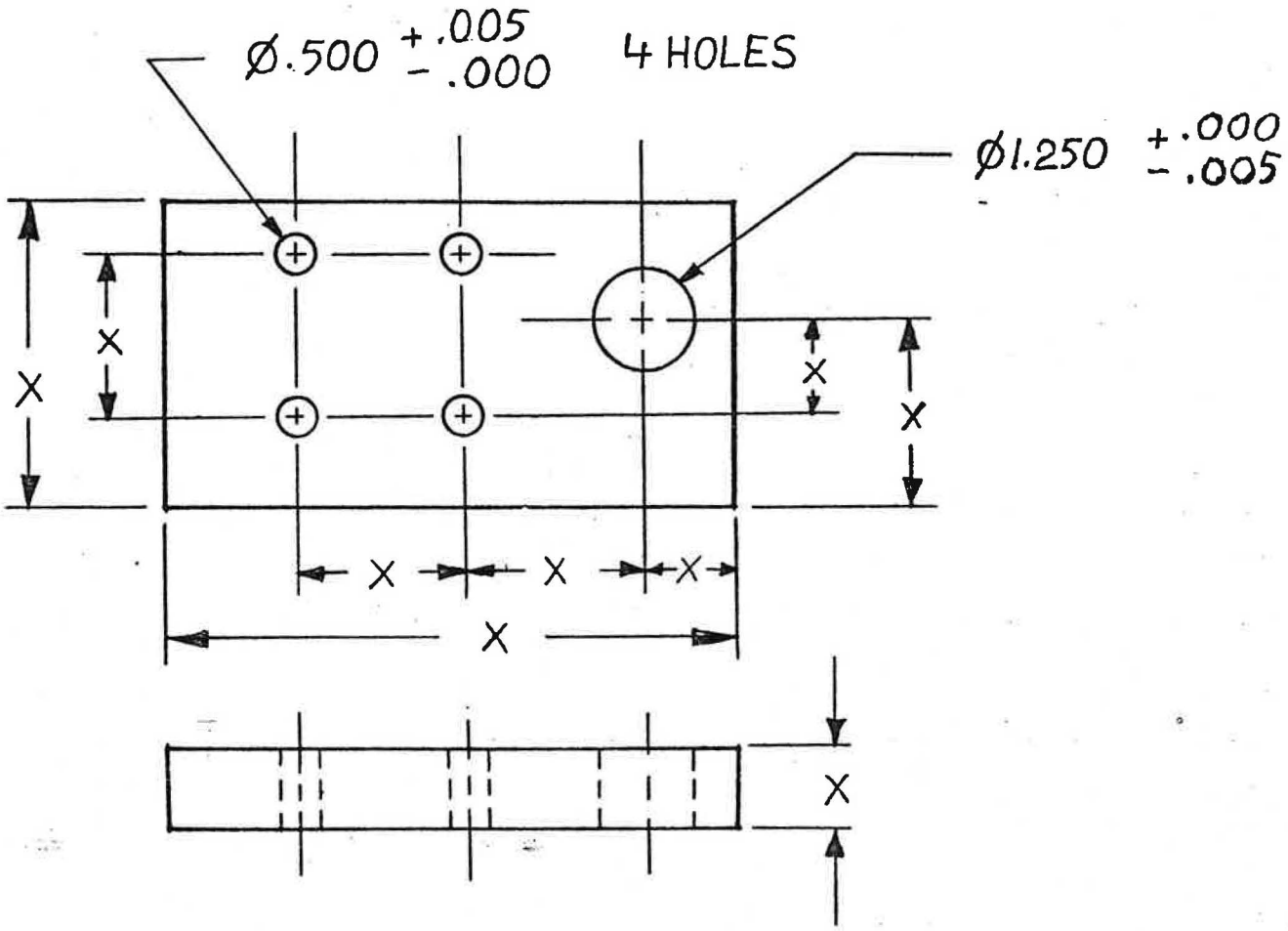
4. Draw all parts accurately on the illustration board at full scale in axonometric instruments. You may use ellipse templates or construct large ellipses by the 4-center method. Lay out a border for a 20 x 30 sheet allowing a 1" margin. Show a parts list and a title block.

5. Choose any of the following rendering methods:

   a. Ink, single line shading
   b. Pencil, multi-line shading
   c. Ink, multi-line shading
   d. Pencil, smudge shading
   e. Stippled ink shading

   and experiment with the chosen techniques on the work layout

6. Extra credit may be given for students who, <u>after completing all the above</u>, make another rendering employing a different rendering method than their first.



GIVEN THE FRONT AND TOP VIEWS OF AN OBJECT.

1. IDENTIFY THE BOTTOM SURFACE OF THE OBJECT AS DATUM "A".
2. IDENTIFY THE Ø1.250 HOLE AS DATUM "B".
3. THIS OBJECT IS TO BE FASTENED TO ANOTHER OBJECT. THE OTHER OBJECT HAS FOUR HOLES OF THE SAME SIZE AND POSITION. FOUR .500 BOLTS WILL BE USED TO FASTEN THE OBJECTS TOGETHER.

   APPLY A POSITION TOLERANCE TO THE DRAWING ABOVE THAT WILL ASSURE THAT THE PARTS WILL MATE. APPLY THE POSITION TOLERANCE AT MMC AND IN REFERENCE TO DATUM "A" AND "B" WHEN "B" IS 1.250.
4. PROPERLY IDENTIFY THE NECESSARY DIMENSIONS AS BASIC.

"ESSAY."

ON THE BACK,EXPLAIN YOUR UNDERSTANDING OF "DATUM". INCLUDE/ EXPLAIN WHAT A DATUM IS, DOES,REPRESENTS. EXPLAIN DATUM POINTS, LINES AND TARGETS. WHAT THEY ARE,WHEN ARE THE NECESSARY. DO NOT TELL ME WHAT A DATUM SYMBOL LOOKS LIKE ETC.

NAME _____

ENGINEERING ORDER

EVERGREEN VALLEY COLLEGE
3095 Yerba Buena Road • San Jose, California 95135

DRAWING TITLE		E.O.	SHT OF
DRAWING NO.	NEXT ASSEMBLY NO.	CHG. LTR.	DATE ISSUED

ORIGINATOR	DRAFTER	REASON
CHECKER	APPROVAL	

INSTRUCTIONS, DESCRIPTION OF CHANGE

DEPARTMENT OF ENGINEERING, DESIGN, & TECHNICAL DRAWING
Sierra College Rocklin, California

DT-20 PIPING SYSTEMS DRAFTING AND DESIGN:

WEEK	DUE DATE	READING/ASSIGNMENTS:
1		Ch. 1-Piping and Insulation...Probs: 2,8,14,22,30,32,36
2		Ch. 2-Welding...Probs: 1,3,5,10,12
3		Ch. 3-Fittings and Flanges...Probs: 1, 3, 5
4		Ch. 4-Valves...Probs: 2 & 5
5		Ch. 5-Piping Drafting...Probs: 3 & 5
6		Ch. 6-System Flow Diagrams & Instrumentation...Prob: 5
7		Ch. 7-Isometrics...Prob: 14
8		Ch. 8-Pipe Supports...Prob:3
9		MID-TERM Ch. 9-Pipe Fabrication...Prob:3
10		Ch. 10-Layout & Design of Piping Systems...Prob: 8
11		Ch. 11-Petrochemical Piping...Prob:1
12		Ch. 12-Conventional Power Piping...Prob: 4a, 4b, 4c, 4d, 4e
13		Ch. 13-Nuclear Power Piping...Prob: 2
14		Ch. 14-Solar Power Piping...Prob: 4 any Figure of your choice
15		Ch. 15-Model Building...Completion of class project of piping model.
16		Appendix A/B
17		REVIEW
18		FINAL EXAMINATION

TEXT: PIPING SYSTEMS DRAFTING AND DESIGN by Lamit
REFERENCE TEXTS: ENGINEERING DRAWING AND DESIGN by Jensen, TECHNICAL DRAWING by Giesecke, Mitchell, Spencer, & Hill.

SPECIAL INSTRUCTIONS:

- Building of model is shared by class members and is worth 150 points each.
- Lettering sheets (obtained at Book Store) are filled out on both sides, vertical and slant, pencil and ink (India Ink), and are turned in weekly...one should allow only 15 minutes per day for lettering practice and do one's best on each sheet per week.
- Time-cards are to be kept daily and printed neatly and totaled weekly. One should have no less than six-hours lab time per week.
- All templates, instruments, books, etc., should be signed out for on clip board. AND returned promptly for others to you. NOTHING IS TAKEN OUT OF THE CLASS ROOM AREA.

GRADING POLICY IS AS FOLLOWS AND ON OTHER SIDE:

Exams=10%, Assign.=30%, Lecture/Labs=30%, Lettering/Model=30%

Possible Points=1000 (Quizes=100, Assign.=320, Lecture=160, Labs=100, Lettering=160, Model=150, Time-card=10)

A=90%, B=80%, C=70%, D=60%, E=(INCOMPLETE) Illness ONLY, F=Below 60% possible points.

Orange Co. Curriculum

INDUSTRIAL EDUCATION

COMPETENCY BASED TASK

MID-FLORIDA TECHNICAL INSTITUTE

Program: Drafting Occupations

TASK LISTING

COURSE: ARCHITECTURE TECHNOLOGY
-RESIDENTIAL-

DUTY	TASK		GROUP 1	GROUP 2	GROUP 3
A		ARCHITECTURAL HOUSE STYLES			
	01	Factors influencing the style of a house			X
	02	Old World residential styles			X
	03	Today's residential styles (Traditional & Contemporary)			X
B		ARCHITECTURAL ROOF STYLES			
	01	Types of roof styles			X
C		RESIDENTIAL SITE SELECTION			
	01	Social & legal aspects			X
	02	Orientation			X
D		ROUGH COST ESTIMATING			
	01	Method			X
	02	Influencing cost factor			X
E		RESIDENTIAL PLANNING			
	01	Working with the client			X
	02	The floor plan			X
	03	Selection of materials & appliances			X
F		ENERGY EFFICIENCY CODES & SOURCES			
	01	F.H.A. Codes			X
	02	State of Florida's Codes			X
	03	Using alternate energy sources			X
G		WORKING DRAWINGS & DETAIL			
	01	Architectural Drawings			X
	02	Mechanical Drawings			X
	03	Electrical Drawings			X
H		PRESENTATION DRAWINGS & RENDERING TECHNIQUES			
	01	Types of perspectives			X
	02	Timesaving perspective drawing techniques			X
	03	Renderings			

ITEM NO.	QTY. REQ'D	MATERIAL DESCRIPTION

LONG BEACH CITY COLLEGE

DWN BY	DATE	DRAWING TITLE
CKD		
APPVD		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
DECIMALS .X ± .1
.XX ± .03
.XXX ± .010
ANGLES ± 1/2°

ASSGN. NO. —	PAGE NO. — PROB. NO.
COURSE NO.	SCALE
SEAT NO.	SHEET OF

DRAFTING & DESIGN

NAME _____

DATE _____ NO. _____

VALDOSTA AREA VOCATIONAL TECHNICAL SCHOOL

BEGIN HERE

CONT. HERE

SANTA ANA COLLEGE MACHINE SHOP

INSTRUCTION IN MACHINING TOOL OPERATIONS SINCE 1948

667-3020 *DAY & NIGHT CLASSES* **17th at Bristol**

DECIMAL EQUIVALENTS
OF NUMBER, LETTER & FRACTIONAL SIZES

DRILL SIZE No.	DECIMAL
80	.0135
79	.0145
1/64	**.0156**
78	.0160
77	.0180
76	.0200
75	.0210
74	.0225
73	.0240
72	.0250
71	.0260
70	.0280
69	.0292
68	.0310
1/32	**.0313**
67	.0320
66	.0330
65	.0350
64	.0360
63	.0370
62	.0380
61	.0390
60	.0400
59	.0410
58	.0420
57	.0430
56	.0465
3/64	**.0469**
55	.0520
54	.0550
53	.0595
1/16	**.0625**
52	.0635
51	.0670
50	.0700
49	.0730
48	.0760
5/64	**.0781**
47	.0785
46	.0810
45	.0820
44	.0860
43	.0890
42	.0935
3/32	**.0937**
41	.0960
40	.0980
39	.0995
38	.1015
37	.1040
36	.1065
7/64	**.1093**
35	.1100
34	.1110
33	.1130
32	.1160
31	.1200
1/8	**.1250**
30	.1285

DRILL SIZE No.	DECIMAL
29	.1360
28	.1405
9/64	**.1406**
27	.1440
26	.1470
25	.1495
24	.1520
23	.1540
5/32	**.1562**
22	.1570
21	.1590
20	.1610
19	.1660
18	.1695
11/64	**.1719**
17	.1730
16	.1770
15	.1800
14	.1820
13	.1850
3/16	**.1875**
12	.1890
11	.1910
10	.1935
9	.1960
8	.1990
7	.2010
13/64	**.2031**
6	.2040
5	.2055
4	.2090
3	.2130
7/32	**.2187**
2	.2210
1	.2280
A	.2340
15/64	**.2344**
B	.2380
C	.2420
D	.2460
E 1/4	**.2500**
F	.2570
G	.2610
17/64	**.2656**
H	.2660
I	.2720
J	.2770
K	.2811
9/32	**.2812**
L	.2900
M	.2950
19/64	**.2968**
N	.3020
5/16	**.3125**
O	.3160
P	.3230

DRILL SIZE No.	DECIMAL
21/64	**.3281**
Q	.3320
R	.3390
11/32	**.3437**
S	.3480
T	.3580
23/64	**.3594**
U	.3680
3/8	**.3750**
V	.3770
W	.3860
25/64	**.3906**
X	.3970
Y	.4040
13/32	**.4062**
Z	.4130
27/64	.4219
7/16	**.4375**
29/64	.4531
15/32	**.4687**
31/64	.4843
1/2	**.5000**
33/64	.5156
17/32	.5313
35/64	.5469
9/16	**.5625**
37/64	.5781
19/32	.5937
39/64	.6094
5/8	**.6250**
41/64	.6406
21/32	.6562
43/64	.6719
11/16	**.6875**
45/64	.7031
23/32	.7187
47/64	.7344
3/4	**.7500**
49/64	.7656
25/32	.7812
51/64	.7969
13/16	**.8125**
53/64	.8281
27/32	.8437
55/64	.8594
7/8	**.8750**
57/64	.8906
29/32	.9062
59/64	.9219
15/16	**.9375**
61/64	.9531
31/32	.9687
63/64	.9844
1	**1.000**

TAP DRILL SIZES
BASED ON APPROXIMATELY 75% FULL DEPTH THREAD

THREAD	DRILL
#0—80	3/64
#1—64	No. 53
#1—72	1/16
#2—56	No. 51
#2—64	No. 50
#3—48	5/64
#3—56	No. 45
#4—40	No. 43
#4—48	No. 42
#5—40	No. 38
#5—44	No. 37
#6—32	7/64
#6—40	No. 33
#8—32	No. 29
#8—36	No. 28
#10—24	No. 25
#10—32	No. 20
#12—24	No. 16
#12—28	No. 15
1/4—20	No. 7
1/4—28	No. 3
5/16—18	F
5/16—24	I
3/8—16	5/16
3/8—24	Q
7/16—14	U
7/16—20	W
1/2—13	27/64
1/2—20	29/64
9/16—12	31/64
9/16—18	33/64
5/8—11	17/32
5/8—18	37/64
3/4—10	21/32
3/4—16	11/16
7/8—9	49/64
7/8—14	13/16
1—8	7/8
1—14	15/16
1-1/8—7	63/64
1-1/8—12	1-3/64
1-1/4—7	1-7/64
1-1/4—12	1-11/64
1-1/2—6	1-11/32
1-1/2—12	1-27/64

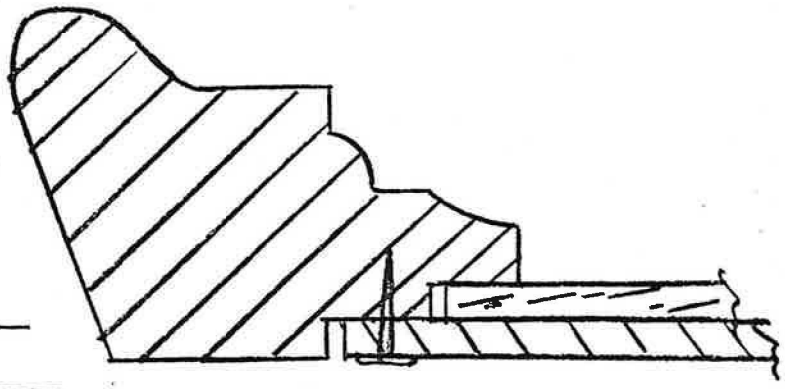
TAPER PIPE Thread	Drill
1/8—27	11/32
1/4—18	7/16
3/8—18	37/64
1/2—14	45/64
3/4—14	59/64
1—11½	1—9/64
1¼—11½	1-1/12
1½—11½	1-47/64
2—11½	2-3/16
2½—8	2-5/8
3—8	3-1/4
3½—8	3-3/4
4—8	4-1/4
4½—8	4-3/4
5—8	5-9/32
6—8	6-11/32

METRIC Thread	Drill
1.6—.35	No. 55
1.8—.35	No. 53
2.0—.4	No. 51
2.2—.45	No. 49
2.5—.45	No. 44
3—.5	No. 38
3.5—.6	No. 31
4—.7	No. 29
4.5—.75	No. 24
5—.8	11/64
6—1	No. 7
7—1	C
8—1.25	I
8—1	9/32
10—1.5	R
10—1.25	S
12—1.75	Z
12—1.25	7/16
14—2	31/64
14—1.5	1/2
16—2	9/16
16—1.5	37/64
18—2.5	5/8
18—1.5	21/32
20—2.5	45/64
20—1.5	47/64
22—2.5	25/32
22—1.5	13/16
24—3	27/32
24—2	7/8
27—3	61/64
27—2	1"

USING THE SECTION VIEW AT RIGHT, DETAIL A MIRROR FRAME THAT MEASURES 28" X 36"

SIZE OF GLASS _____

SIZE OF BACK PANEL _____



FROM THE TOP VIEW OF THE END PANEL SHOWN AT RIGHT, DESIGN A DUST FRAME THAT WILL FIT THE UNIT. INCLUDE ONE BACK PARTING, ONE FRONT PARTING RAIL, TWO DUST END RAILS, ONE DUST BOTTOM.

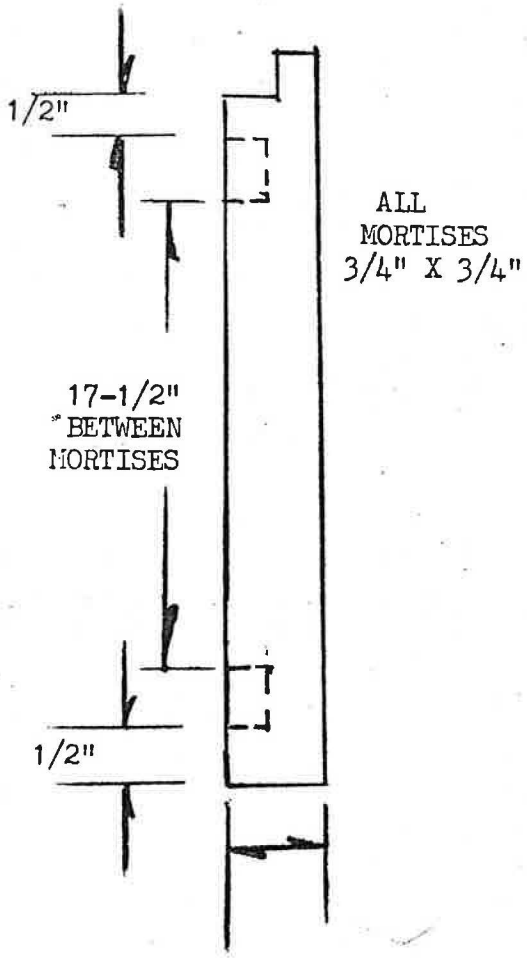
NOTE: ALL MORTISES 3/4" X 3/4" X 5/8" DEEP

ALL TENONS 1/2" LONG

ALL 1/4" TENONS FOR GROOVES TO BE CENTERED IN 3/4" STOCK.

ALL GROOVES FOR 1/4" TENONS TO BE 9/16" DEEP.

SHOW ALL NECESSARY CLEARANCES.



DESIGNING FOR IMPACT & FATIGUE LOADS

THE DESIRED:

1 THE MEMBER MUST BE LARGE ENOUGH SO THAT THE STRESSES WILL BE HELD BELOW THE CRITICAL VALUES FOR FAILURE.

2 THE MEMBER MUST BE FLEXIBLE ENOUGH SO THAT IT WILL YIELD SUFFICIENTLY UNDER THE IMPACT, CAUSING THE STRESSES TO BE LOW.

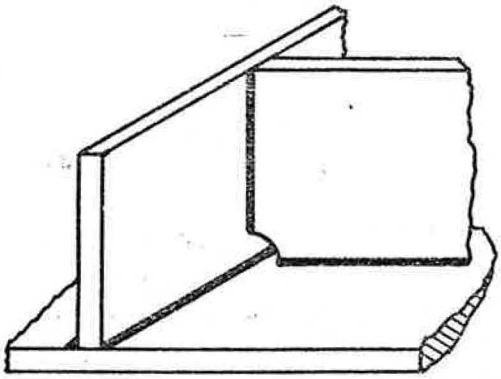
DESIGN THE MEMBER IN ORDER TO PRODUCE JOINTS:

1 WITH A MINIMUM OF STRESS CONCENTRATION

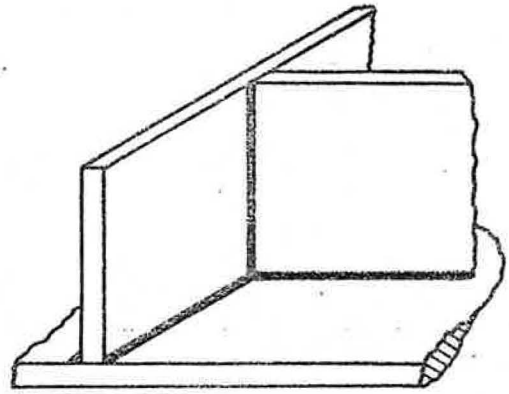
2 WHICH AREN'T RIGID OR STIFF WHERE IMPACT FORCES MUST BE ABSORBED.

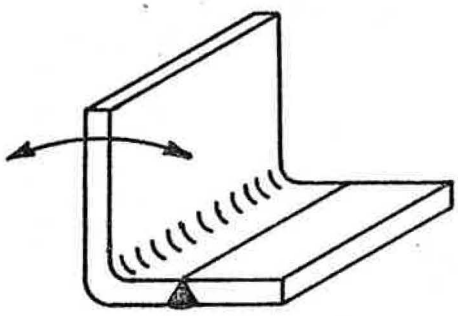
TYPICAL JOINTS

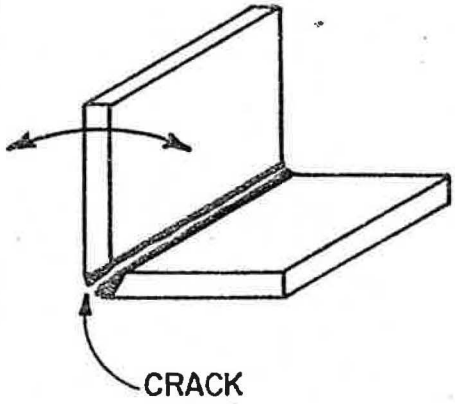
RECOMMENDED



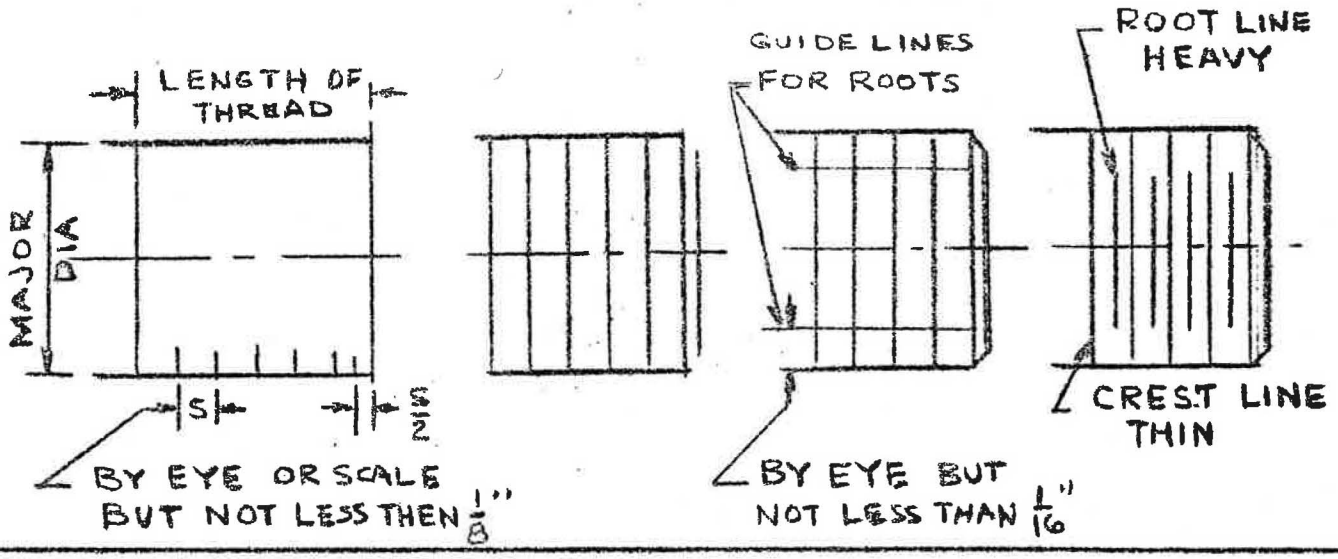
TRY TO AVOID

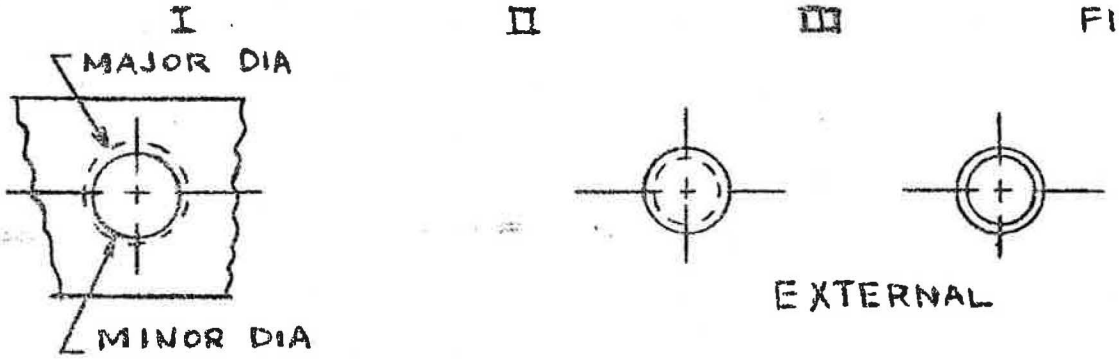


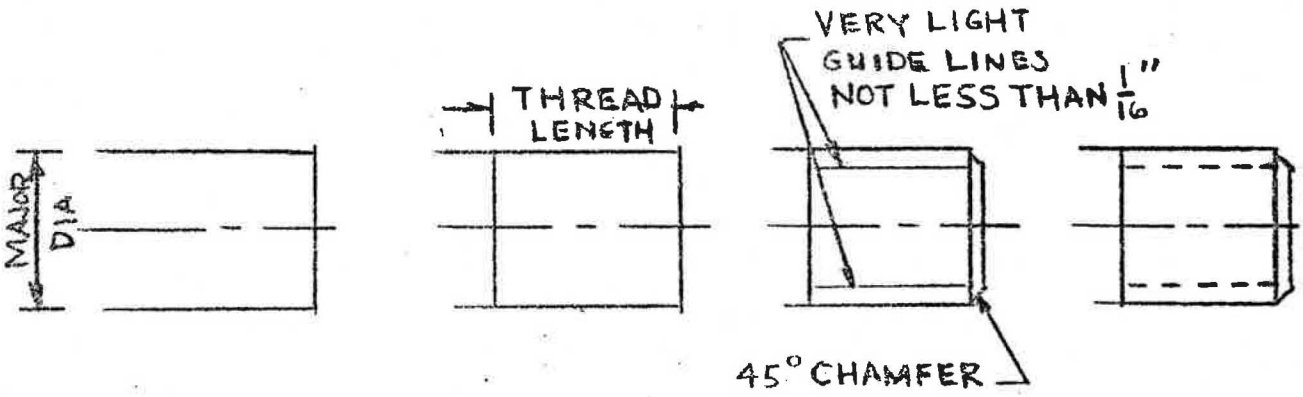




SCHEMATIC LAYOUT







SIMPLIFIED LAYOUT

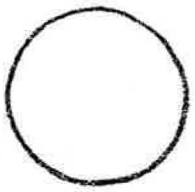
LIGHT AND SHADE

Principles of Light and Shade on Form — Rendering Light and Shade — Optical Illusions — Practical Uses

It may surprise you to discover that in the first two lessons of your Course you have already covered most of the important principles of drawing! Many untrained beginners spend months—even years—on drawing practice, yet with little success, because they are not familiar with basic drawing principles. They do not know, as you do, the importance of careful observation. They do not even know *how* to observe. They must learn through trial and error such principles as proportions, foreshortening, and the following of contours, that you are already familiar with. You are already seeing with the artist's eye. Your task now is to put to use the things you have learned, and to develop your artistic abilities through practice.

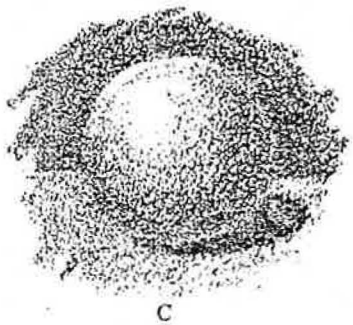
In this lesson, you are going to study another very important aspect of drawing, the treatment of light and shade. We think you are going to find this subject particularly interesting. For one thing, you have been seeing the effects of light on the forms around you all your life. Even so, you may not have given much thought to their causes, or may imagine that this is a very complicated subject. On the contrary, light and shade principles are quite simple. Since you are already so familiar with the effects of light, it will be an easy matter to understand what causes these effects. Moreover, by making proper use of light and shade, you can easily create very "finished" looking pictures. You'll be delighted to see how, with a few simple tones, you can suggest such different things as bulk and weight, depth and distance, smoothness and roughness, in your pictures.

In a drawing it is possible to represent many things quite convincingly with simple outlines. But lines alone can never suggest the richness of detail, the solidness of forms, the variety of textures you can actually see in nature. A good example of this is the drawing of the ball at A in Illus. 1. This circular line doesn't give you any idea of the solid roundness of the ball. Moreover, there is really no such line around the actual form. Even if we add a little shading to the line drawing, as at B, we don't succeed in expressing the true roundness of the ball. But now look at C. Here you can almost pick the ball off the printed page, its roundness is so convincing! Here it is truthfully rendered in its light and shade values. Its surroundings or background are given their proper relative values. As in nature the ball is represented entirely by different degrees of light and shade; there is no line around the form.



A

B

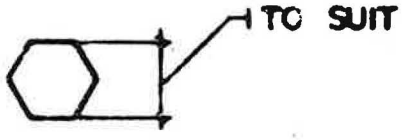


C

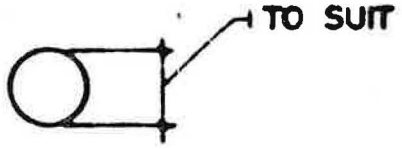
Illus. 1

Light and shade, then, can be an aid to the powerful expression of form in drawing. As you learn to handle light and shade, you'll learn how to suggest the solidness of objects, how to make them appear to stand out from their surroundings, how to show their relationships to other objects in the picture. This can lead to all sorts of other important accomplishments: How to portray sunlight and moonlight, how to suggest a scene by lamplight or by firelight, how to show the difference between polished metal and soft cloth in a sunlit room. All these are "tools" that you, as an artist, will be using in the creation of your pictures.

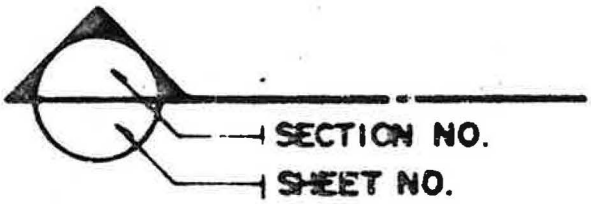
TITLE, SECTION & DETAIL SYMBOLS



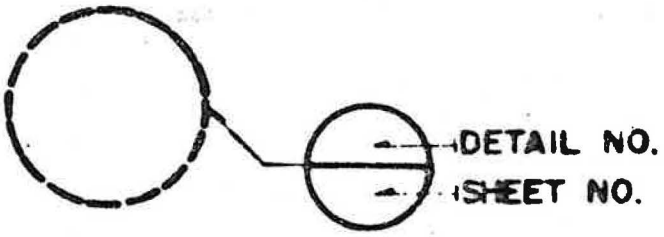
WINDOW CALL OUT



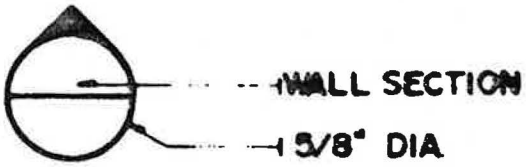
DOOR CALL OUT



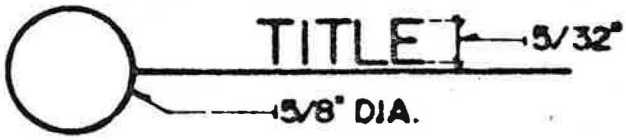
SECTION CALL OUT



DETAIL CALL OUT



WALL SECTION CALL OUT



DETAIL TITLE
OR SECTION TITLE

TITLE

APPENDIX - O

MATERIALS COLLECTED

Brochures

1- Engineering Drafting/Civil Engineering Technology, Northern Virginia C.C., Virginia

2- How about a Career in Drafting Technology, Gulf Coast C.C., Miss.

3- The Applied Technology Apprenticeship & Training Programs, Macomb C.C., Michigan

4- Technical Drafting, Rio Hondo College, Calif.

5- Engineering Design Graphics, Texas A & M University, Texas

6- Computer Aided Design, Laney College, Calif.

7- Technical Illustration/Drafting& Design Technology, Mid-Flordia Technical Institute, Fla.

Engineering Drafting

NORTHERN VIRGINIA COMMUNITY COLLEGE

Civil Engineering Technology

NORTHERN VIRGINIA COMMUNITY COLLEGE

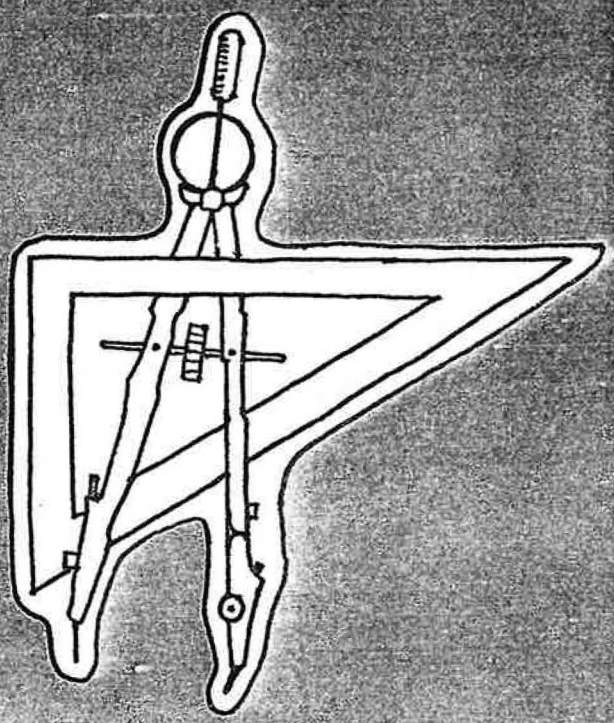
How About a Career in

Drafting Technology

offered by

Gulf Coast Community College

DRAFTING AND DESIGN TECHNOLOGY



VALDOSTA TECH VT

THE APPLIED TECHNOLOGY APPRENTICESHIP & TRAINING PROGRAMS

JOB TRAINING

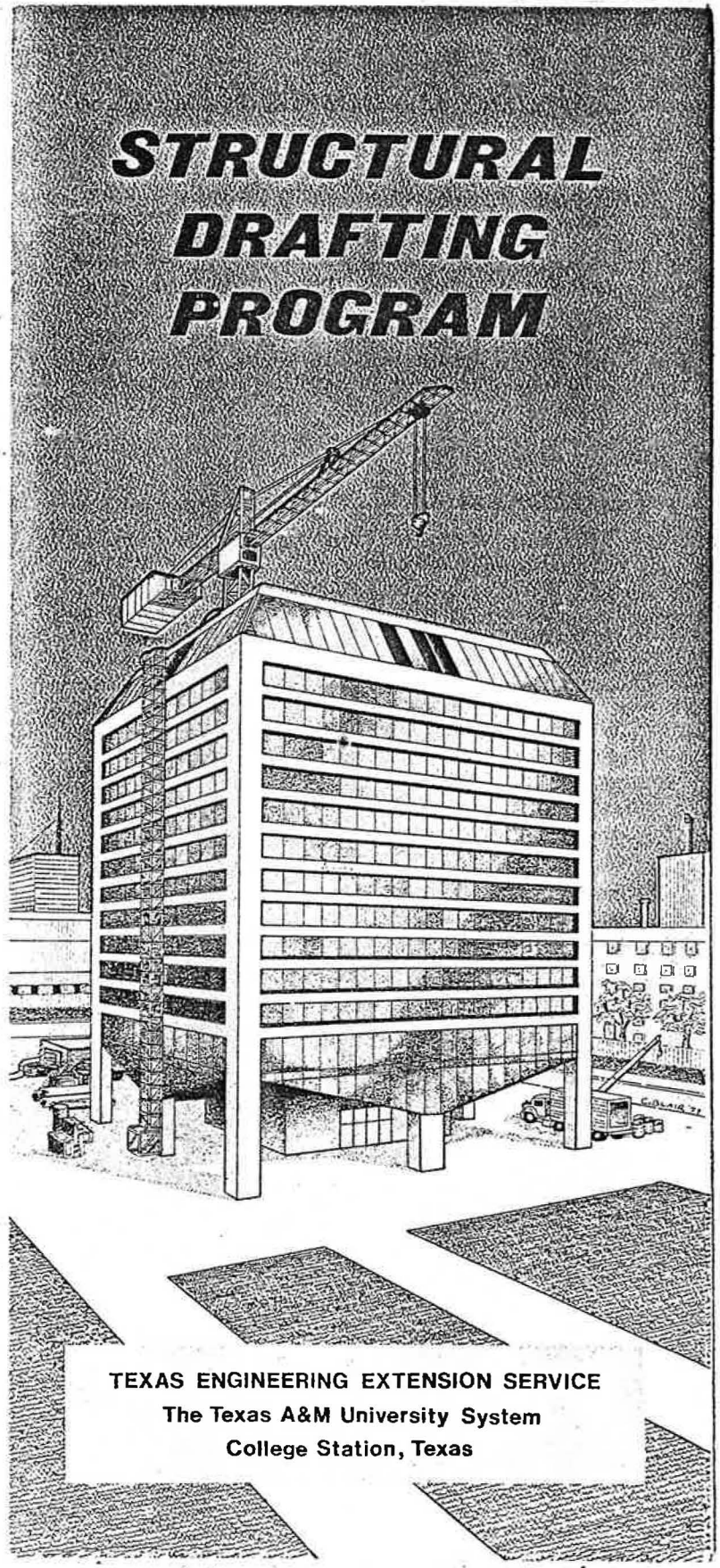
Macomb Community College

TECHNICAL DRAFTING

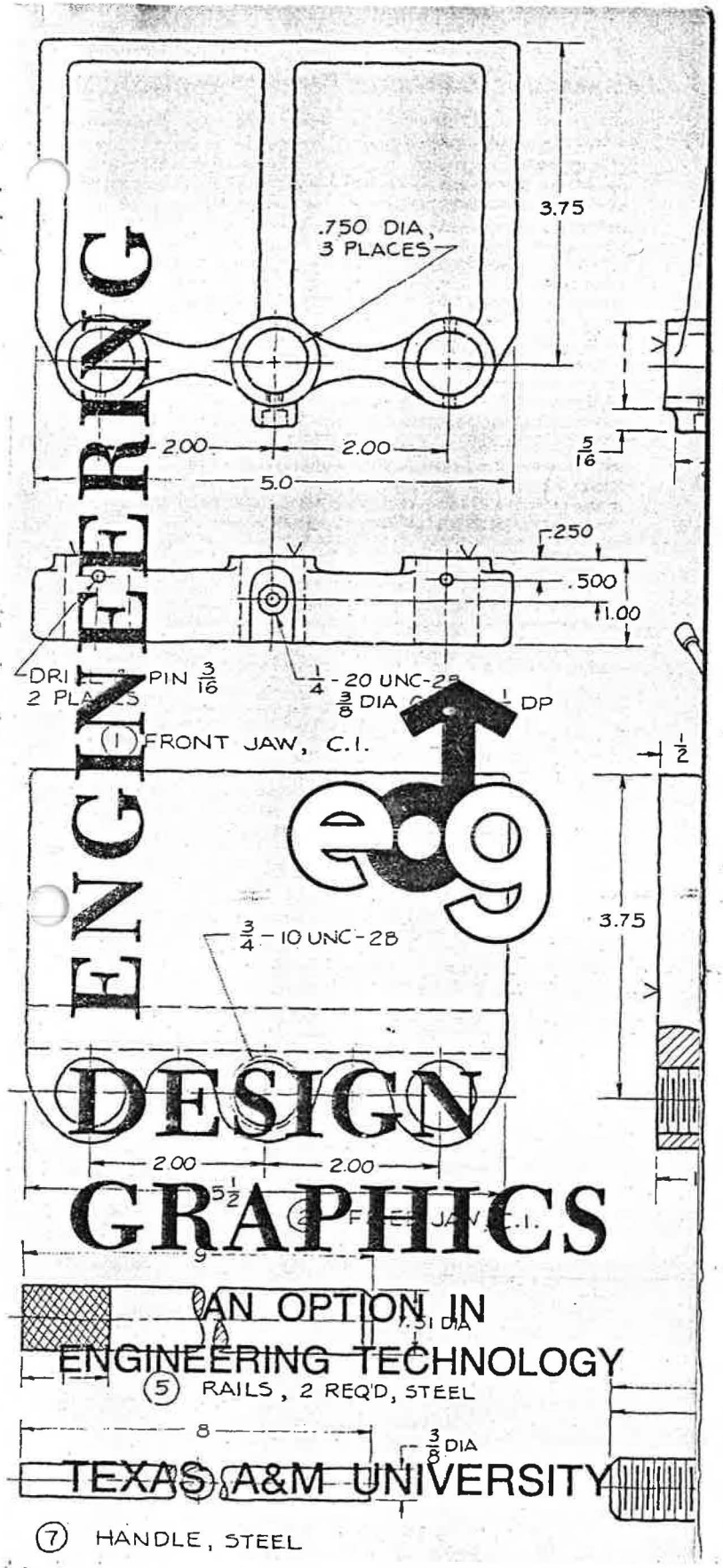
RIO HONDO COLLEGE

WHITTIER, CALIFORNIA - 90608
3600 WORKMAN MILL ROAD,
TELEPHONE 692-0921

STRUCTURAL DRAFTING PROGRAM



TEXAS ENGINEERING EXTENSION SERVICE
The Texas A&M University System
College Station, Texas



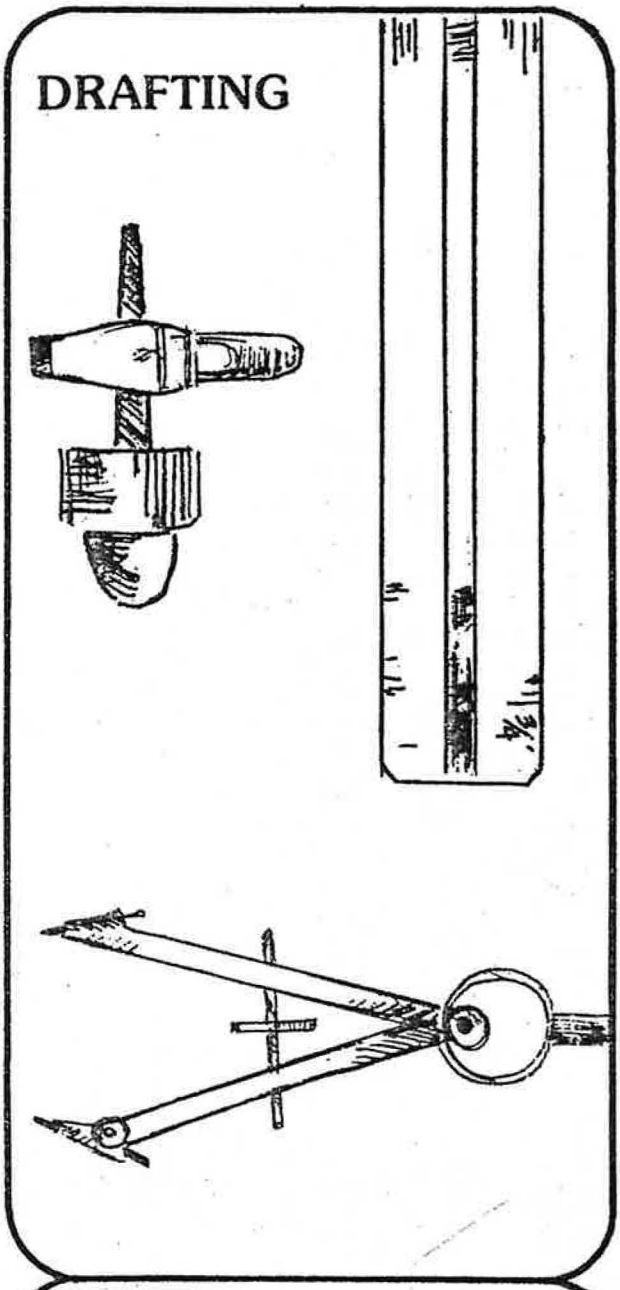
ENGINEERING

DESIGN

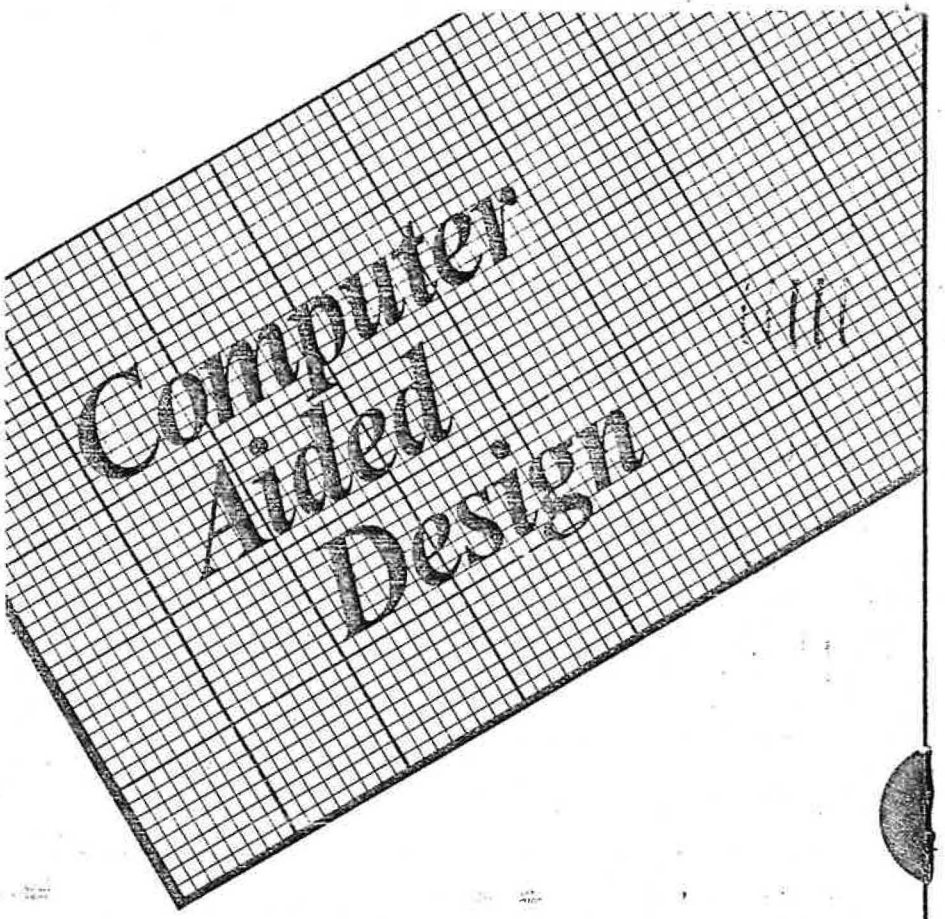
GRAPHICS

AN OPTION IN
ENGINEERING TECHNOLOGY

TEXAS A&M UNIVERSITY



Dept. of Industrial Education

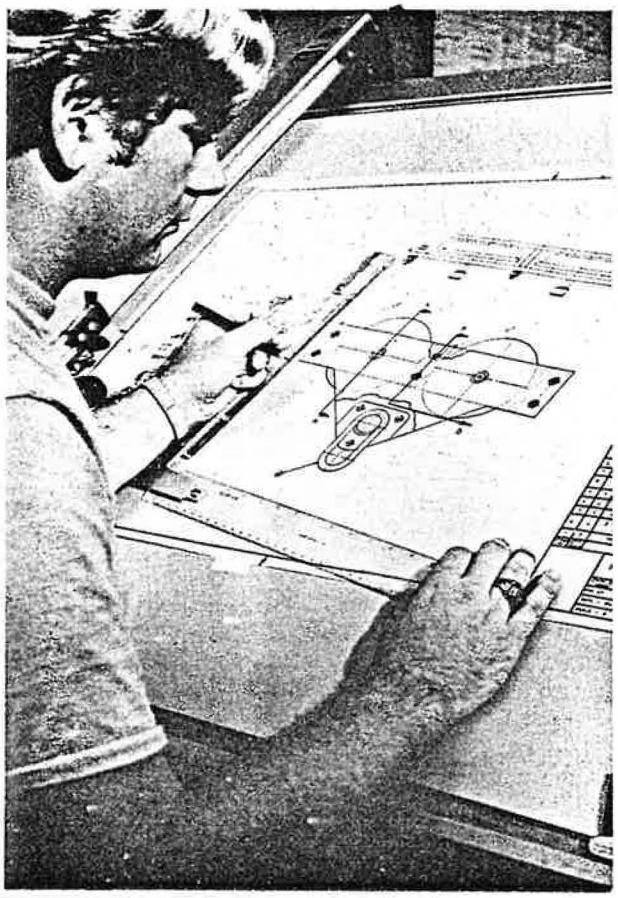


AT LANEY COLLEGE
OAKLAND, CA.

A PROFESSIONAL DEVELOPMENT SEMINAR FOR COMPUTER AIDED DESIGN DRAFTING IN ARCHITECTURE

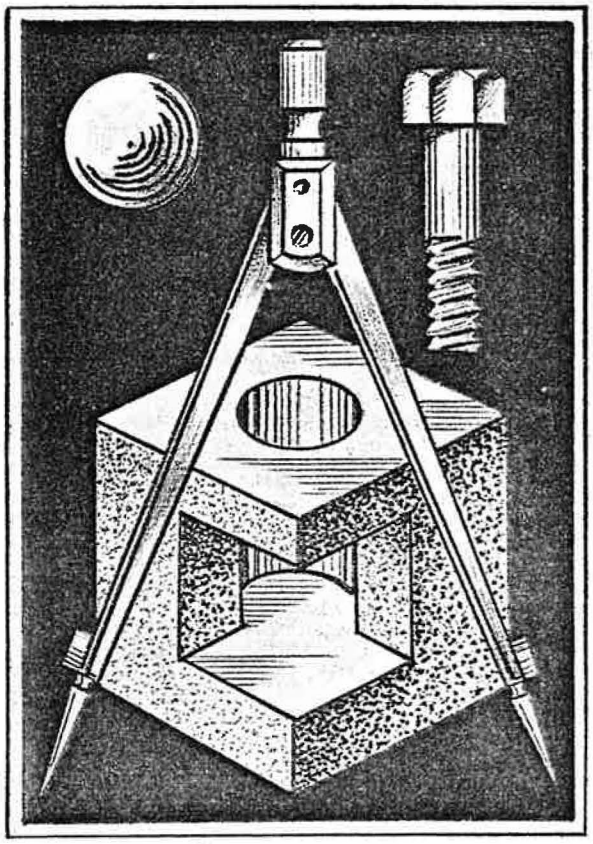
SUMMER 83

DRAFTING AND DESIGN TECHNOLOGY



MID-FLORIDA TECHNICAL INSTITUTE
2900 West Oak Ridge Road
Orlando, FL 32809
Ph. (305) 855-5880

TECHNICAL ILLUSTRATION



MID-FLORIDA TECHNICAL INSTITUTE

2900 West Oak Ridge Road
Orlando, Fl 32809
Ph. 305-855-5880

APPENDIX - O

MATERIALS COLLECTED

Robotics

1- Robotics Research Workshop, U. S. Dept. of Commerce

2- New Frontiers in Vocationa Education. Mr. C.R.Wallace

3- Robotics Technician Training at Macomb Community College

4- Mitsubishi Industrial Micro-Robot, Japan

5- Robots, Their Impact and Potential in Industry, Westmoreland C.C., Pa

NBS SPECIAL PUBLICATION 602

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

NBS/RIA Robotics Research Workshop

C. R. (Buz) Wallace
Educational Marketing Manager

Veritechnology
ELECTRONICS CORPORATION
P.O. Box 167, St. Joseph, MI 49085
(616) 982-3206

Heathkit
Zenith Educational Systems

ROBOTICS

NEW FRONTIERS IN VOCATIONAL EDUCATION

In the late 70's the world was experiencing an electronic revolution. Although we were experiencing this revolution our nation was on the brink of a grave technician shortage.

Today an unprecedented battle is being waged among industrial nations for world supremacy in Technology. The U. S. has been so far ahead for so long that it is difficult for the U. S. public to realize how rapidly that lead is disappearing and, in many cases already lost.

Robotics is now progressing more rapidly in Europe and Japan. U. S. semiconductor companies after spearheading electronics and computer technology are cutting their long range R & D back drastically as a result of the economic downturn. While the U. S. has lost the lead in some areas of semiconductor manufacturing and is presently behind in the world of Robotics, I do not feel that this will continue.

There are several new frontiers in Vocational education that should be mentioned at this time.

Communications
Computers
Robotics

Obviously communications and computers have been with us for a number of years. How is it then that we can call these technologies new frontiers.

Lets look at what has happened in recent years to the communications field very briefly. I say briefly because my knowledge of this area is itself limited from a technical standpoint. But with the advent of computer and satellites the industry has changed tremendously.

We now have satellite receivers that can be located in your own yard for TV and audio reception.

We have electronic mail via computers and terminals that can be sent anywhere in the world via telephone lines and satellites.

Fiber optics is the newest emerging technology that has become a reality in the last few years. Such companies as AT&T' GTE, ITT, and Harris are deeply involved in the communications

ROBOTICS TECHNICIAN TRAINING
at MACOMB COMMUNITY COLLEGE

by Edward J. Lynch
Dean, Occupational Education
Macomb Community College
Warren, Michigan

Industrial robots have been used in experimental manufacturing applications for over twenty-five years. However, this aspect of flexible automation did not receive serious consideration by American industry until the late 1970's. Growth in the 1980's and 1990's is projected to be explosive as a result of increased applications and the development of more sophisticated robots. The number of units in place in 1991 is expected to reach 100,000 compared with approximately 7,000 today.

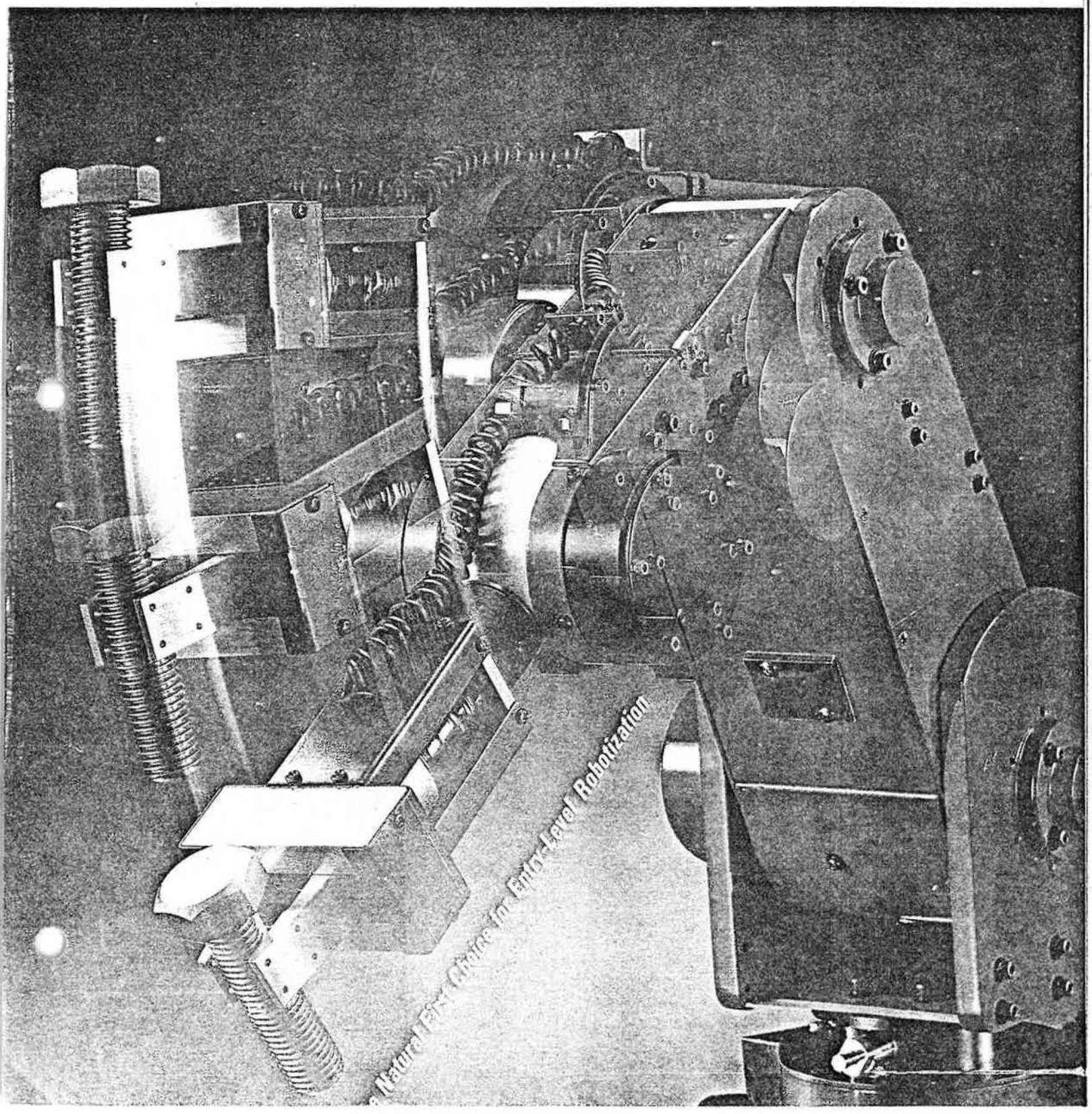
There are some who refer to the use of these devices as a second industrial revolution that will far exceed the first in its impact on mankind. The robot, it is felt, has the capacity to change most aspects of how we live and work.

As labor costs increase and productivity gains become more difficult to achieve, it is clear that a reindustrialization of the United States will be accomplished through the greater application of automation, computerization and robotization (robots do not need breaks, vacations, sleep, get ill or bored and can work in job situations that are hot, dirty, noisy, contain radiation hazards or are considered unsafe for humans).

Increasingly, manufacturers are turning to robots to achieve production gains and improve product quality. This, in turn, is creating a demand

MITSUBISHI
INDUSTRIAL MICRO-ROBOT
IMPLEMENTATION SYSTEM

RM-501 Movemaster



ROBOTS

Their Impact and Potential in Industry

July 16, 1982

Westmoreland County
Community College
Youngwood, PA 15697

APPENDIX - O

MATERIALS COLLECTED

Other Materials

1- Lecture Notes, Descriptive Geometry for Engineers and Design Draftsmen, City College of San Francisco, Calif.

2- Visual Communication - Drafting, State Department of Education, Calif.

3- Career Preparation in Architectural Technology, City College of San Francisco, Calif.

4- The Career Book, Miami-Dade C.C., Flordia
Skills Today for Jobs Tomorrow, Mid-Flordia Technical Institute, Fla.

5- Certificate of Competency, Mid-Flordia Technical Institute, Fla.

6- Houston Community College System Foundation/ Long Range Plan, Houston Community College District, Texas

7- Assembly California Legislature, Assembly Committee on Education, Cali

8- Education Reform Issues: Hearing Schedule, Assembly California Legislature

9- Architecture Technology - Student Record, Mid- Flordia Technical Institute, Fla.

10- Student Employment Highlights 1977-1982, St. Paul Area Vocational Inst

11- Tokyo Kogyo University, Administration Building, Japan

12- Tokyo Kogyo University, Classroom Scene, Japan

13- Nissan Motor Corp. Advertisement, Japan

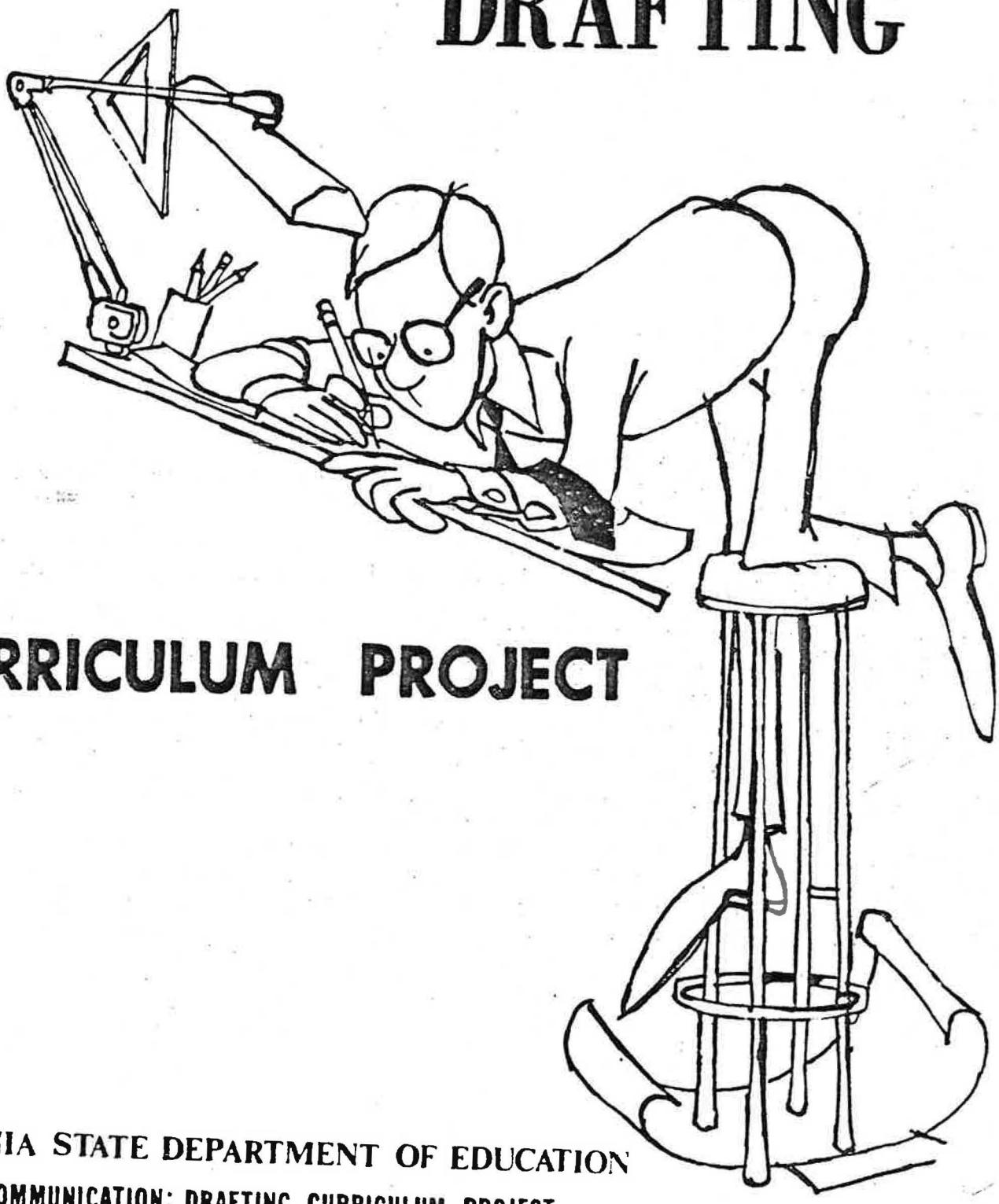
LECTURE NOTES
ON
DESCRIPTIVE GEOMETRY
FOR
ENGINEERS AND DESIGN DRAFTSMEN

WILLIAM FELZER
ROBIN CRIZER

CITY COLLEGE OF SAN FRANCISCO

VISUAL COMMUNICATION

DRAFTING



CURRICULUM PROJECT

CALIFORNIA STATE DEPARTMENT OF EDUCATION

VISUAL COMMUNICATION: DRAFTING CURRICULUM PROJECT

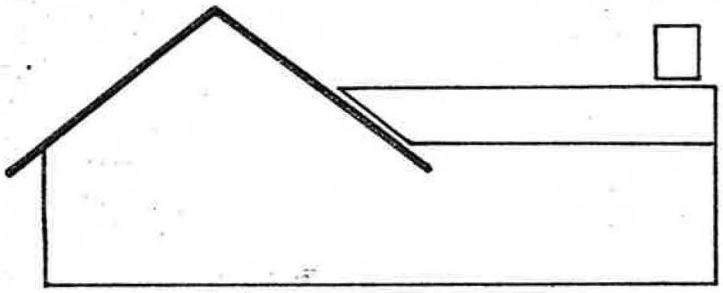
KEITH BUSH director DAVID McCREADY coordinator

830 NORTH CAPITOL AVENUE SAN JOSE, CA 95133

(408) 925-7503

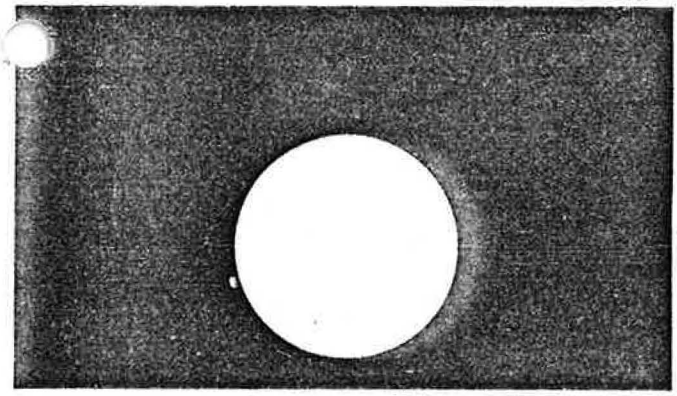
Career Preparation in

ARCHITECTURAL TECHNOLOGY



- ARCHITECTURAL INTERIORS
- ARCHITECTURAL DRAFTING
- CONSTRUCTION MANAGEMENT TECHNOLOGY

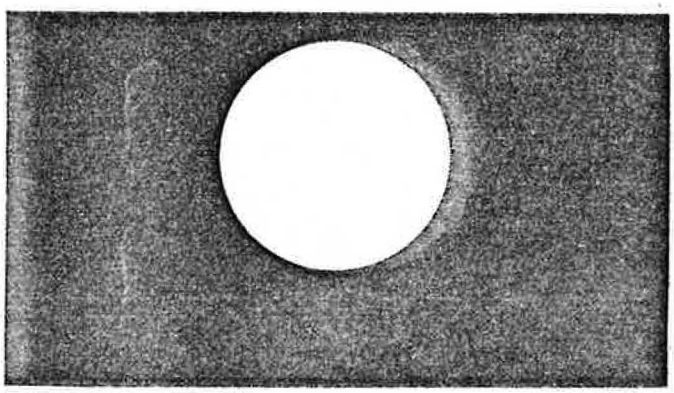
City College of San Francisco



THE CAREER BOOK

Miami-Dade Community College

MIAMI, FLORIDA



Mid-Florida Technical Institute

AN AREA VO-TECH CENTER
ORANGE COUNTY PUBLIC SCHOOLS, ORLANDO, FLORIDA

Certificate of Competency

THIS IS TO CERTIFY THAT

GLORIA STELLA HURTADO

HAS SATISFACTORILY COMPLETED THE
REQUIRED COMPETENCIES ACKNOWLEDGED ON THE REVERSE SIDE
FOR THE PROGRAM OF

Architectural Detailer

AND IS HEREBY GRANTED THIS CERTIFICATE

THIS 27th DAY OF April, 19 83.

Joseph E. Stephens
DIRECTOR

_____
INSTRUCTOR

Houston Community College System Foundation

P. O. Box 7849
Houston, Texas 77270
(713) 868-0704

Houston Community College System

LONG RANGE PLAN 1980-1985

Prepared under the direction of Dr. Carla Danbury
Resource Development
1980-81 School Year

Assembly
California Legislature

Assembly Committee on Education

STATE CAPITOL
(916) 445-9431

TERESA P. HUGHES
CHAIRWOMAN

K-12 Schools/Special Appropriation Requests

Legislative measures requesting loans of the General Fund shall adhere to the following items of analysis and compliance before being heard by Committee.

(1) Districts must apply according to current law

(2) Base Revenue Limit

(3) Total Revenue Limit

(4) Student/teacher ratio/number of classified/certified personnel

(5) A.D.A. - declining/steady/increasing

(6) A.D.A. amount per student with special apportionment

(7) What percent of district budget does the special appropriation represent?

(8) Circumstances surrounding deficit situation

(9) District's efforts in addressing deficit problem

(10) Future financial plan

(11) Local options/other than fiscal

(12) Current district liabilities, e.g., county superintendent, State Allocation Board

(13) Review and comment by representative bargaining units of the districts plan

(14) Review and comment by Department of Finance before set in Committee

(15) Review and comment by the Department of Education

EDUCATION REFORM ISSUES: HEARINGS SCHEDULE

Hearing Issues	Full Committee Hearing Date
I. PERSONNEL: How can the State provide incentives to attract and retain the highest quality school personnel? Specifically:	
-- Techniques for improving the skills of school employees, including attention to the new teacher proficiency exam and	March 22
-- Techniques for recruitment of high quality college students to education; quality of personnel preparation and inservice training; and personnel evaluation	
II. DUE PROCESS ISSUES: Should the State modify current laws or regulations of employment of school employees?	April 5
III. CURRICULUM: What should be the State's role? Specifically:	
-- The reinstatement of statewide minimum high school graduation course requirements and instructional materials problems	April 12
-- The State and local testing system of K-12 students	April 19
IV. FINANCE: What is the State's obligation with respect to Public School Finance? Especially:	
-- Overview of School Finance History. Discussion of COLAs for revenue limits and categorical programs; Serrano issue; minimum guarantee etc. and funds available for specific reform proposals.	April 26 (Joint with Budgetary Subcommittee)

MID-FLORIDA TECHNICAL INSTITUTE
Orlando, Florida 32809
ARCHITECTURAL TECHNOLOGY (9449)

STUDENT RECORD

Total Hours:_____

Social Security Number:_____

Name:_____

Date Entered:_____

Address:_____

_____

TOTAL PROGRAM COMPETENCIES

COMPLETION DATES

ARCHITECTURAL DETAILER_____

ARCHITECTURAL DRAFTER _____

STRUCTURAL DRAFTER _____

* Occupational Titles (DOT)

TASK	INTRODUCTORY DRAFTING *ARCHITECTURAL DETAILER	GRADE
1.	Basic Techniques	
2.	Lettering	
3.	Geometric Construction	
4.	Orthographic Projection	
5.	Dimensioning	
6.	Sectioning & Views	
7.	Auxiliary Views	
8.	Fasteners	
9.	Pictorial Drawings	
10.	Shades & Shadows	
11.	Free Hand Sketching	
12.	Architectural Concepts	

TASK	ARCHITECTURAL DRAWING *ARCHITECTURAL DRAFTER	GRADE
1.	Residential &/or Commercial Plng.	
2.	Floor Plan	
3.	Foundation Plan	
4.	Exterior Elevation	
5.	Section	
6.	Interior Elevation	
7.	Plumbing Plan	
8.	Electrical Plan	
9.	Plot Plan.	
10.	Specifications	
11.	Energy Efficiency Codes	
12.	Cost Estimating	
13.	Model Building	

TASK	STRUCTURAL STEEL DETAIL *STRUCTURAL DRAFTER	GRADE
1.	Frame & Seated-Bolted	
2.	Frame & Seated Welding	

	REINFORCING BAR DETAIL	GRADE
1.	Workbook Problems	
2.	Working Drawings	

	RELATED SUBJECTS	GRADE
1.	Technical Math I	
2.	Technical Math II	
3.	Technical Math III	
4.	Physics	
5.	Surveying	

Remarks:_____

_____

_____

Certified By:_____ Date:_____

OCCUPATIONAL PROGRAM		SIX YEAR PLACEMENT RECORD * % EMPLOYED IN MAJOR/RELATED FIELD 1977	1978	1979	1980	1981	1982	1982 PLACEMENT REPORT C	A	P	Monthly Salary Av.$	Lo-Hi $
TECHNICAL	%	97	99	100	98	97	93	#1	#2	#3	#4	#5
Chemical Technology		100	95	100	100	100	100	20	19	19	1296	1213-1493
Civil Technology		100	100	100	100	100	100	22	22	22	1192	1083-1560
Architectural and Engineering Technology (Construction Technology)		91	100	100	83	100	77	14	9	7	1063	953-1126
Design Technology		100	100	100	100	100	92	38	26	24	1223	823-1473
Electro-Mechanical Tech.		71	97	100	100	86	92	36	25	23	1074	867-1438
Electronic Technology		99	100	100	100	99	96	83	74	71	1250	693-2100
Industrial Hydraulics		100	100	100	91	91	71	27	17	12	1230	1040-1629
TRADE & INDUSTRIAL	%	94	99	100	97	90	85					
Auto Body Repair		100	100	100	100	100	100	20	17	17	1161	693-2100
Auto Mechanics		100	100	100	100	100	100	16	15	15	1083	780-1404
Cabinetmaking		100	92	100	96	100	89	31	28	25	1022	867-1126
Carpentry		100	100	100	90	94	84	19	19	16	1200A	780-1386
Commercial Art		94	100	100	67	79	83	15	12	10	910	780-1144
Electricity		84	94	100	100	65	89J	58	56	50	1213J	693-1733
Graphic Arts		100	100	100	100	94	86	75	62	53	1005	693-1733
Machine Tool-Die Moldmkg.		100	100	100	100	100	81	93	75	61	1144	867-1773
Painting and Decorating		100	100	100	100	85	86	23	21	18	1206A	1040-1317
Pipefitting		100	100	100	100	100	100	22	22	22	1697A	-- --
Plumbing		56	80	100	100	73	58	13	12	7	1430A	1213-1907
Sheet Metal		82	100	100	100	55	71	16	14	10	1040	823-1265
Truck Mechanics		95	100	100	86	71	78	19	18	14	1191	780-2025
Watch Repair		100	100	100	100	100	100	21	17	17	1205	867-1740
Welding		100	100	100	100	96	71	56	48	34	1175	797-1766
BUSINESS AND DISTRIBUTIVE	%	98	98	100	99	92	90					
Accounting I & II		94	100	100	100	100	100	60	37	37	961	800-1387
Bookkeeping/Clerical		100	100	100	100	90	89	15	9	8	848	736- 925
Clerical Refresher		--	--	--	--	--	100	28	23	23	809	650-1057
Data Entry Operator		96	100	100	100	80	73	62	41	30	868	693-1257
Data Processing I & II		20	100	100	89	N/A	93	32	29	27	1040	823-1200
Freight Transportation Mgt.		94	100	100	100	100	82	13	11	9	1317	1015-1733
Respiratory Therapy		79	100	100	95	100	91	24	23	21	1137	1040-1178
Restaurant & Hotel Cookery		96	100	100	100	100	90	45	38	34	973	867-1213
TOTAL % PLACED RELATED	%	96	99	100	97	92	87					
TOTAL AVAILABLE STUDENTS		1163	1306	1242	1289	1130	1247					

* Statistics based on annual (July 1 to June 30) Completions as reported to State Dept. of Voc. Ed. on Nov. 1. *Up-dated and revised 4/1/83.

#1 C: Completions - students who are awarded a diploma upon satisfactory completion of program requirements as prescribed by the Program Advisory Committee and/or students who have reached a training objective with marketable job skills and may be awarded a Certificate of Training.

#2 A: Available for Related Employment - students available to accept related employment (this includes persons who are unavailable due to continued education, relocation, personal or other reasons).

#3 P: Placed in Related Employment - students employed in their major program field or a closely related field.

"1982": % Employed in Major/Related Field - Column 3 divided by Column 2

#4 Av and #5 Lo-Hi: Entry Level Monthly Salary - (Av) Average and (Lo-Hi) Low-High range of gross monthly salaries of individuals listed in Column 3, and based on a beginning 40-hour work week as reported by newly employed students (figures do not include overtime pay, commissions, bonuses, etc.) as of November 1, 1982.

A = Apprenticeship C = Commission

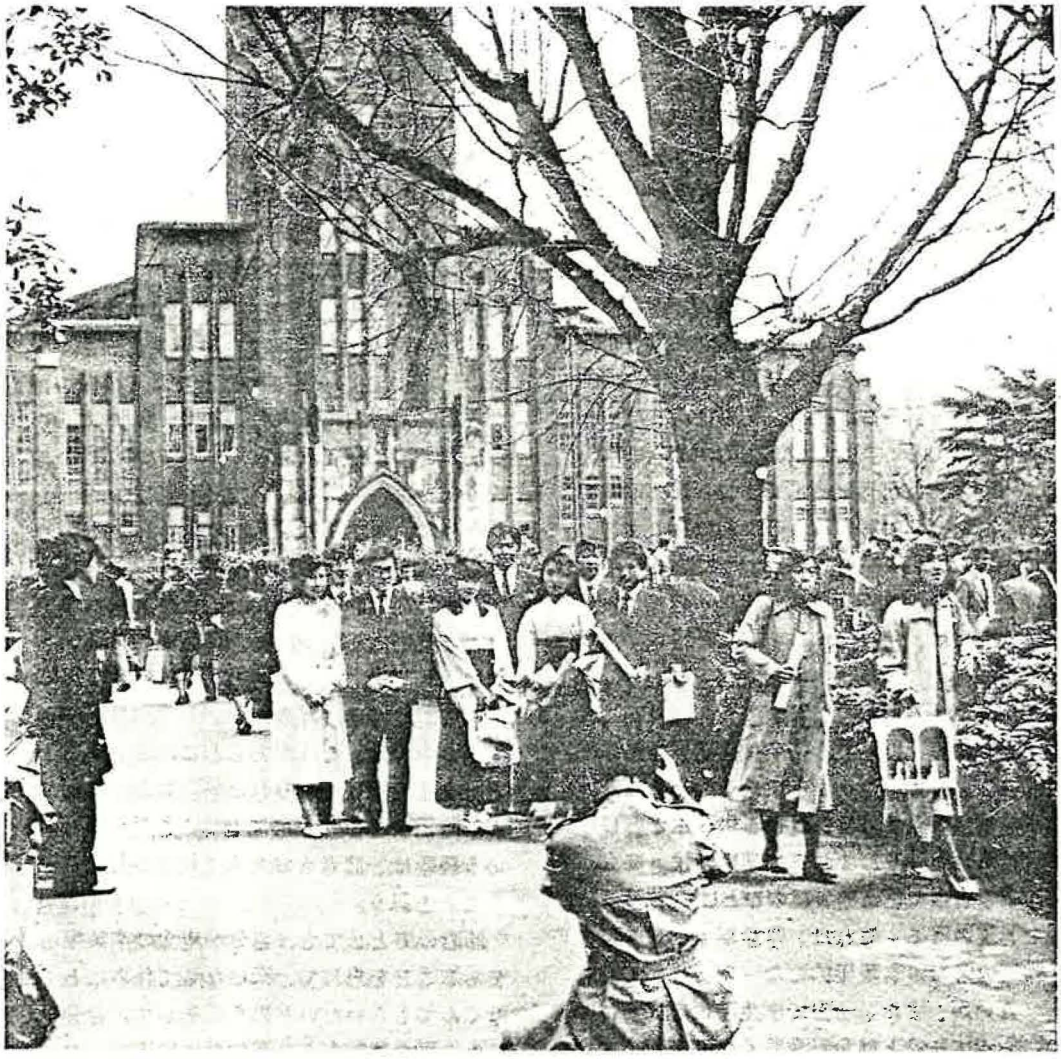
J = the Joint Apprentice Training Committee has accepted 89% (50 of 56) for future employ...

No. 596

学内広報

1983. 3. 22
東京大学広報委員会

特別記事　平野総長の「卒業生に贈る」を掲載

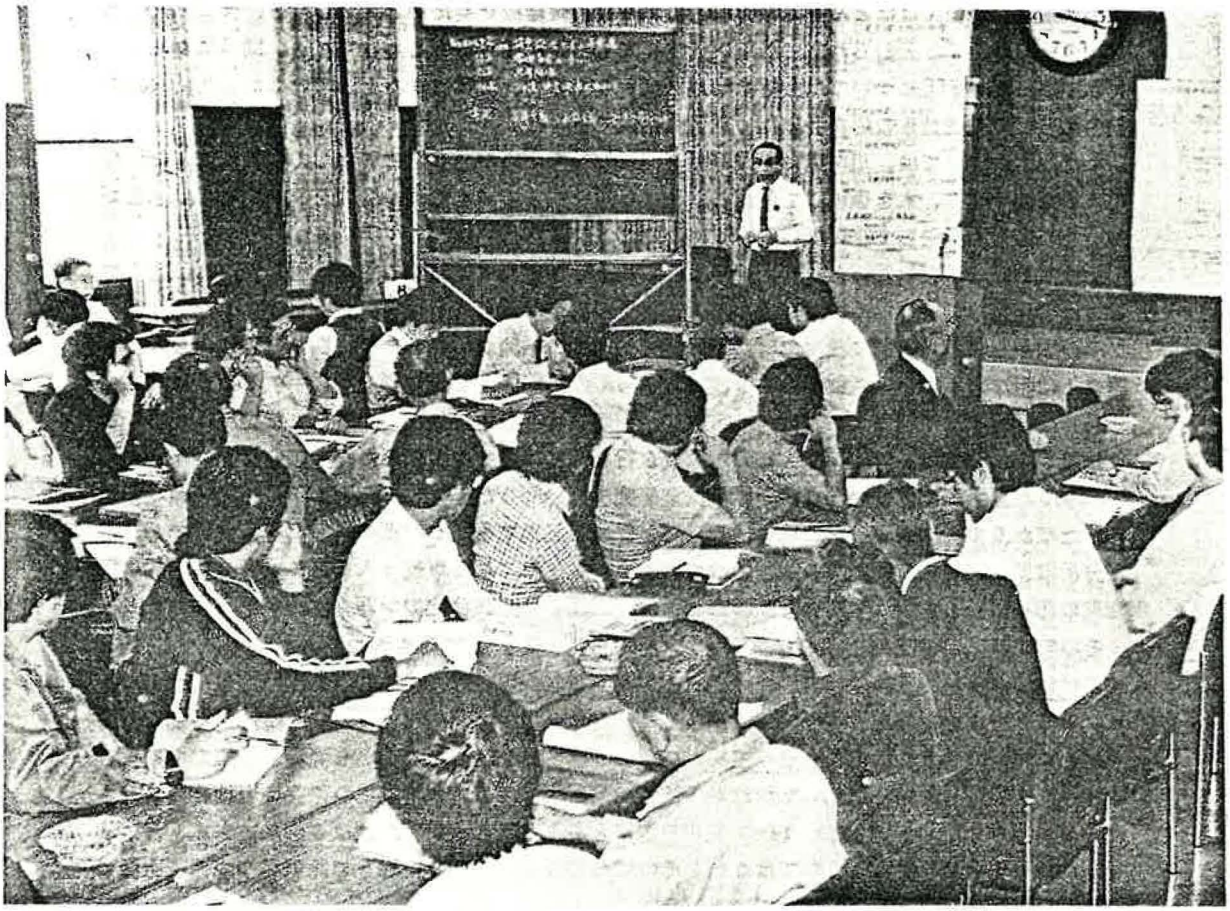


弥生の風物詩

春がみちてくると、学校は卒業のときをむかえる。今年も本学のキャンパスに、そのときがめぐってきた。卒業の風景は弥生を飾る一つの風物詩といえよう。（写真は昨年３月、卒業生でにぎわった銀杏並木の風景）

環境安全

No. 16
2. 1983

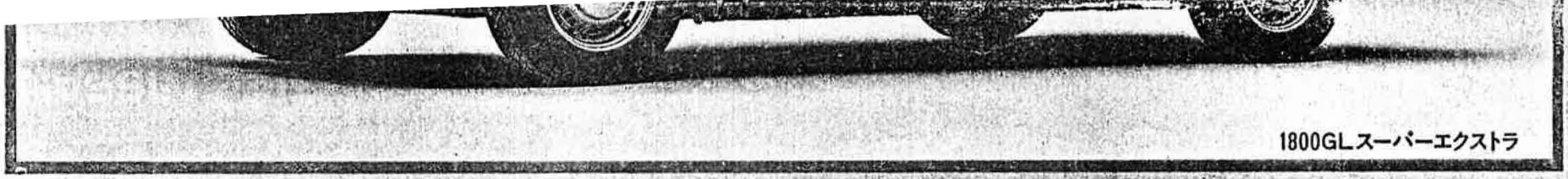


環境安全講習会点描

生産技術研究所環境安全委員会（委員長　木村尚史教授）で、昭和57年10月13日開催した環境安全講習会風景

撮影：生産研写真班

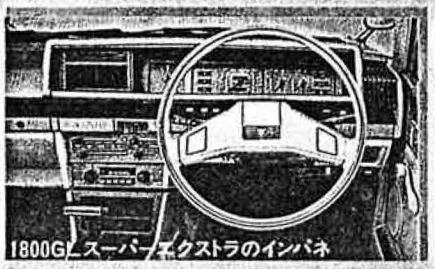
〈目　　次〉



1800GLスーパーエクストラ

魅力の装備を搭載して、いま疾走はドラマチック。

いま、No.1*の伝統をしっかりと受け継いだ、魅力の新シリーズが登場する。
1600GLスーパーエクストラ、1800GLスーパーエクストラ、1800SSS-Eスーパーエクストラの4ドアセダン3タイプ。
ドライバーのこころをドラマチック・ロードに誘う、グッとノーブルなブルーバードだ。



1800GLスーパーエクストラのインパネ

1800GLスーパーエクストラの室内

1800GLスーパーエクストラのクロームメッキラジエターグリルとハロゲンヘッドランプ

流麗なラインとシャープな面を持つ、ウェッジ・シェイプ。セダンの本質を捉えた、美しいスタイリングだ。室内に足を踏み入れると、高まるドライバーのプレステージ。機能とアートの融合するインストルメントパネルが、豊かなコンフォータブル・スペースが、五感を優しくつつみ込み、こころを物語りの主人公へと変貌させる。走り始めれば、CAエンジンのビビッドなアクセルワーク。流れるような加速感を、存分に体験できる。そして、特筆すべきは、魅力の豪華装備。第一級の風格をドレスアップするばかりでなく、ドラマチックな満足感までも伝えてくれる。スーパースターを所有する者だけに与えられる、無類の歓び。いまこそ、この新シリーズで、あなたもブルーバードのオーナーに。

〈スーパーエクストラ主要装備〉

●カーバッジ ●クロームメッキラジエターグリル ●ボディカラー共色フェンダーミラー ●ハロゲンヘッドランプ ●フィレットモール ●ホイールハーフカバー ●ブラックアウトワイパー ●専用アクセントストライプ(ツートーンは除く) ●AM/FMマルチラジオ ●ターボテックス地高級シート ●革巻タイプシフトノブ(A/T車) ●リモコンミラー 以上3タイプに装備 ●ラジアルタイヤ(1600GLと1800GL・165SR13、1800SSS-E・185/70SR14) ●合わせぼかしフロントガラス(1800GL、1800SSS-E) ●マッドガード(1800SSS-E) ●カセットデッキ(1800SSS-E)

実績があるからこそ、高性能を謳歌できる。3年連続No.1*という偉業を、ブルーバードはいとも簡単にやってのけた。夢の4ドアハードトップが、高性能のCAエンジン(1.8/2.0一部)が、走り込むほどに完成度の高さを証明する。いま、ブルーバードが一番眩しい。

ブルーバード、っっ走るものよ。

4ドアハードトップターボSSS-X・G type(ターボステッカー、アルミロードホイールは注文装備)

ブルーバードお前の時代だ。

NEW ザ・スーパースター NISSAN ブルーバード

*昭和55、56、57年、国内小型乗用車(1,600－2,000ccクラス)年間登録台数。自販連調べ。

もう走り始めています 21世紀へ—先進技術の日産

NISSAN NISSAN