

DEGREE PROGRAMS LEADING TO THE BACHELOR OF
TECHNOLOGY IN ELECTRONICS OFFERED BY
INSTITUTIONS WITHIN THE
UNITED STATES

By

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CHAPTER I

INTRODUCTION

The growth and success of modern industry depends upon the availability of qualified, educated and technically competent personnel to constantly fill rapidly changing job positions and responsibilities. The skills of personnel needed constitutes a wide spectrum of knowledge from the high manipulative skills of the craftsman to the high cognitive skills of the research scientist (1). Included in this spectrum are the technicians, technologists and engineers needed to provide continuity within the spectrum. This study is concerned with the third category within this spectrum, the technologist, and particularly, the electronic technologist, and the ability of colleges and universities to prepare individuals for this career field.

With the increase in the cognitive level of the state-of-the-art technology there is an increase in the cognitive gap between the craftsman and the engineer. Such a phenomena has been taking place in industry in past years, creating the need for the technician to provide services between that of the craftsman and the engineer. In recent years the gap has become so large that another type of individual is required to fill a gap between the technician and the engineer. This individual is the technologist. The technologist receives training similar to the technician, but that training is expanded to include more cognitive knowledge, supervisory and administrative skills. With the increasing demand for the technologist by industry, colleges and

universities have had to develop educational programs to prepare individuals for this field. These colleges have done so without a standard curriculum guide to follow. Consequently, of the many technologist programs offered in the United States, a diversity appeared to exist in the scope and content of those programs.

Statement of the Problem

Many electronics technologists are graduates of four-year degree programs in electronics technology offered by institutions within the United States. Unfortunately, due to a lack of uniform definitions of the four-year programs and the requirements of their graduates, a great diversity appeared to exist in these programs (2). This diversity is included in the objectives, course content, cognitive level, degree title, and possibly the consequent employability and entry-level wages resulting from the differences. Because of this diversity, a study of this educational discipline appeared timely. A set of criteria was needed with which these programs could be compared and evaluated in terms of the others. Such an instrument would be useful in reviewing the quality of existing programs, and would aid in the design of new ones.

The problem with which this study was therefore concerned was to determine if such a diversity in educational programs in electronics technologist training actually existed. This study was also concerned with whether or not realistic definitions of the job responsibilities and required knowledge of the technologist actually existed in industry and if they existed, were they used by industry in employment policies and practices.

Purpose of the Study

The Purpose of this study was to compare the four-year degree programs in electronics technology offered by institutions within the United States. Emphasis was based on a comparison of the curricula, the entry-level wages of the program graduates, and the opinions of the educators involved with program development concerning the definition of the requirements of technologist education. This purpose can be delineated by the following specific objectives:

- a. To determine which institutions in the United States offered a baccalaureate degree program in electronics technology during the 1976-1977 academic year.
- b. To document the titles of the degrees offered by those institutions.
- c. To develop a set of criteria from which baccalaureate degree programs in electronics technology can be compared and evaluated.
- d. To document and summarize the content of the baccalaureate electronics technology curriculum offerings available from those institutions and rank them on a cognitive level scale.
- e. To determine the correlation between the job title and entry-level wages of the graduates of the programs and the position on the cognitive scale of the institution providing the graduate.
- f. To determine if a significant diversity in the baccalaureate degree programs in electronics technology actually existed.
- g. To determine if, in the opinion of the educators contacted, adequate definitions of the title, education, and job responsibilities of the technologist were used in education and in industry.

Need for the Study

The need for this study was generated by a lack of uniform definitions for the engineering, baccalaureate engineering technology, and

two-year or associate degree engineering technology programs and related employment areas. Engineering educators, employers and state professional engineering license boards all interpret somewhat differently who can be called an "engineer" and who can be called a "technologist" (3). The New York State Education Department conducted a study of the status of engineering technology programs within the state of New York and found similar definition problems (4). Through the comparison of the programs offered by the colleges and universities a set of criteria could be generated which would be useful in evaluating existing programs. This study would fill such a need.

Prospective students also need to know the differences in the programs offered throughout the country in order to select a program which best suits their personal needs. This study was designed to provide a single source which contains information on most of the programs offered, and would significantly help the student in the selection of an institution for degree pursuit.

Scope of the Study

This study was limited to institutions offering four-year degree programs in electronics technology within the United States which responded to information requests. Also, only programs labeled "electronics technology", "electrical technology", "electronics engineering technology", "electrical engineering technology" or electronics or electrical majors of an "engineering technology" program were considered. This eliminates programs in electrical power or industrial electronics from the study. These programs are significantly different in philosophy and objectives than those considered in this study.

Graduate placement and entry-level wage information was limited to graduates of the spring and fall semesters of 1977.

The rankings given in the study were not intended to label a particular program as "good" or "bad", but rather to show its position within the manipulative-cognitive scale in relation to the other programs that were included within the study.

Definition of Terms

The following definitions, developed by ECPD, were intended for use in the engineering discipline and were used in this study (5).

Engineering Team

A configuration of technical personnel possessing complimentary capabilities that facilitate the engineering process in a particular situation. Various mixes of technicians, engineers, and technologists are usually involved, but scientists, craftsmen, and other specialists are also included in some projects.

Engineering

Engineering is a profession in which the knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgement to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind.

Engineering Technology

Engineering technology is that part of the technological field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer at the end of the spectrum closest to the engineer.

Engineer

The term "engineer" will mean a person who, by reason of his or her special knowledge and use of the mathematical, physical, and engineering science and the principles and methods of engineering analysis and design, acquired by engineering education and engineering experience, is

qualified to practice engineering. The engineer will normally have earned a baccalaureate degree in engineering and gained appropriate experience in the field.

Engineering Technician

The term "engineering technician" will mean a member of the engineering team who, in support of and under the technical direction of professional engineers, scientists, engineering technologists, or senior engineering technicians can carry out in a responsible manner either proven techniques which are common knowledge among those who are technically expert in a particular technology or those techniques especially prescribed by professional engineers which are mastered through considerable experience in the field or educational laboratory situations.

Engineering Technologist

The term "engineering technologist" will mean a member of the engineering team who, by reason of his or her knowledge and applications of the well established mathematical, physical science, engineering principles, and methods of technological problem solving, acquired by engineering technology education and engineering technology experience, is qualified to practice engineering technology. The engineering technologist will usually have earned a baccalaureate degree in engineering technology or gained considerable technical experience.

Electronics Technology is that part of the engineering technology field which requires the application of the principles of electricity and electronics. Electrical power technology, industrial electronics technology, and broadcast electronics programs were not considered within the scope of this definition.

Technical courses are those courses in the specific area of electronics technology.

Related technical courses are those courses which are technical in nature but are not specifically electronics courses. Examples include technical drawing, statics, strength of materials and shop skills.

Mathematics Courses are those courses which deal specifically with a mathematical science. In the engineering technology field, courses

can include algebra, trigonometry, differential and integral calculus, statistics and probability.

Science courses are those courses that exclusively deal with one of the physical, natural, or life sciences. These would include physics, chemistry, biology or life science.

General education courses refer to those courses which cannot be classified as mathematics, science, technical or related technical. These courses would include language, humanities or social sciences.

ECPD is the Engineers' Council for Professional Development.

ASEE is the American Society for Engineering Education.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to compare the four-year degree programs in electronics technology offered by institutions within the United States. Emphasis was placed on a comparison of curricula, entry level wages of the program graduates, and opinions of the educators involved with program development concerning the definition of the requirements of technologist education. To accomplish this purpose, two approaches were employed. First, a comparison of the curricula of the colleges was conducted. Second, a survey of placement information and educators' attitudes concerning the use of definitions was conducted.

Identification of the Need

During the ten year period from fall 1967 to fall 1976, enrollments in engineering technology programs increased over two and one-half times, and the number of schools offering these programs increased by more than three times. During this same time period, the number of students enrolled in baccalaureate programs in engineering technology increased from 223 to 10,487. This represents an increase of almost fifty times. Students enrolled in four-year degree programs in electrical or electronics technology programs comprised 16% of all baccalaureate technology students, representing the largest single group (6). This data shows the significant increase in students and colleges involved in four-year degree programs in electronics technology. The

number of institutions starting new baccalaureate programs is now increasing at a slower rate, and the number of institutions having ECPD accredited programs has risen to over 50% of those offering such programs. Along with this increase in program quantity and quality, industry has indicated that it likes what it is getting from baccalaureate technology programs. Therefore, educators and administrators must continue in their efforts to establish clear definitions within the discipline. Only in this way will the colleges and universities be able to maintain high quality baccalaureate technology educational programs (7).

The average starting salary of the baccalaureate technology graduate has increased from \$10,077 to \$12,000 during the period from 1971 to 1976 (8). This projects an average salary of approximately \$13,000 in 1977 and \$13,500 in 1978. The salaries paid to the graduates of the institutions described in this study should not vary far from these figures, so an analysis of the graduate salaries was included in the study.

From these figures it can be determined that industry is willing to employ graduates of technology programs, but if a significant diversity existed in these programs, could industry really know what it is getting for its investment? As a result of this unanswered question, a study of the discipline was timely.

Results of Previous Research

Robertson (9) completed a similar study on two-year electromechanical programs offered within the United States. In his report he illustrated a diversity of opinion concerning curriculum content.

He also showed a lack of curricular materials within the discipline from which to develop a program. He found this to be a leading cause for the diversity. Robertson made an effort to contact each of the schools which offered the program, and requested curricular details. Using the curriculum analysis practice initiated by Dr. Maurice Roney (10, p. 10) the subject matter was grouped into five major areas: technical, related technical, mathematics, science and general education. Tabulations were made of the percentage of the total credit hours devoted to each of the five major subject matter areas. Included in these were the percentages of the curriculum devoted to the sum of the technical and related technical courses.

In addition to tabulations of curriculum content and number of graduates, information was listed regarding the following:

1. Type of Science (physics, chemistry etc.)
2. Level of mathematics.
3. Presence of computer emphasis.
4. A summary of pertinent data in terms of credit hours, contact hours and percentages of the total curriculum was prepared.

Diebel (11) conducted a similar survey on chemical technology programs; again, two-year degree programs. In the study, Diebel concluded that a reevaluation of the programs was needed in order to limit the diversity of curricula offered throughout the United States. His solution was the use of a model curriculum. A population of 100 colleges was selected, and from that population a random sample of 40 colleges was used. Curricular information was requested and a questionnaire was forwarded to the educators responsible for the selected programs. Diebel also used Roney's curriculum analysis method.

The New York State Education Department (4) conducted a study of baccalaureate technology programs within the state of New York. A summary of the findings indicated that the terms "bachelor of technology" and "technologist" suffer from lack of definition among employers and educators alike. The report also indicated that it was impossible to assess with precision the issue of whether the baccalaureate technology graduate is different from the engineer or technician by virtue of the difficulty experienced in defining either learning objectives or work functions.

Methodology of Previous Research

Both Robertson and Diebel used Roney's curriculum analysis method, and consequently, an adaptation of that method was used in this report.

Robertson also compared the electromechanical technology programs throughout the country to that offered at Oklahoma State University. In order to express the relationship of Oklahoma State's program to the national average, he used an indicator of the magnitude and significance of the differences. A standardized score, a Z-score, was computed which expressed the variation from the mean in standard deviation units. This computation was performed by using the relationship,

$$Z = \frac{(Y-X)}{S}$$

where X is the national average, Y is the Oklahoma State value, and S is the standard deviation of the sample of the scores in question.

In addition to the Z-score calculation, Robertson also employed the Chi-square technique taken from Bernstein (12, p. 18) in his analysis of the credit hours, laboratory hours and theory hours of the Oklahoma

State program in a comparison with the national average. This method enabled Robertson to determine if there was a significant relationship between the two.

Another method of analysis used involved the comparison of employment patterns of the program graduates. Satre (13) used a questionnaire as his primary instrument for the gathering of data for his research. He sent questionnaires to several New York State industries requesting attitudes concerning hiring policies and practices used in obtaining graduates of baccalaureate technology programs. The results of his study showed that the most common title given technology graduates was that of an engineer. Most were members of engineering teams, and the wages given the technology graduates was commensurate with that given engineers.

Questionnaire Usage

As previously shown, Satre made significant use of the questionnaire in the preparation of his report. This data gathering technique was also used in each of the other reports cited. "The economy, relative ease of administering, uniformity of questions, and the ability to standardize questions are all advantages in using questionnaires (14, P. 10)."

When using questionnaires, certain rules and limitations should be considered. The respondents' motivation is difficult to assess, and can effect the validity of the response. Also, unless a random sample of the returns is used, those returned completed may represent biased samples (15). Consequently, it should seek only that information which cannot be obtained from another source; it should be as short as

possible; it should be attractive in appearance; directions should be clear and complete; and last, should be easy to tabulate and interpret (16).

Summary

From a review of the literature it was evident that a problem of definition does exist within the discipline of engineering and engineering technology. It causes problems, not only in the development of high quality educational programs, but also in the interpretation of the credentials of the technology graduate by the employer. Because of this lack of uniform and realistic definitions there is a significant difference in the curriculum scope and content in many related fields of technology.

The methodology for curriculum analysis offered by Dr. Maurice Roney was often, and successfully, used to compare and evaluate the diverse curricula within the individual fields of technology. Employment statistics were also frequently used in the evaluations.

Questionnaires were also frequently used as a research tool, and when designed properly, the researchers realized useful results from them.

CHAPTER III

METHODOLOGY

The purpose of this chapter is to describe the design of the study, the techniques used for the collection of the data and the methods used in the analysis of that data. The data collected included an example of a typical plan of study, a set of course descriptions of technical courses and a questionnaire from each institution. The information requests and the questionnaires were sent to the department chairmen of each program considered. In order to provide a document which covers as much of the discipline as possible, all colleges and universities which responded to the search, and offered a program in electronics technology were studied. Those institutions which did not provide the proper information were considered as non-respondents and were dropped from the study.

Assumptions

The design of this study was based upon several assumptions. The first assumption was that the information supplied by the colleges concerning their curriculum, plan of study and course descriptions was accurate, and was an indicator of the status of the program at the time of the study.

It was also assumed that the respondents to the questionnaire made a genuine effort towards the accurate completion of its requirements, and that the respondents were sufficiently knowledgeable in their field

to provide accurate answers.

It was further assumed that the placement and entry level wage data supplied describing past graduates was an accurate indicator of the status of the graduates of that program at the time of the study.

Another assumption was that the plan of study example provided by the institutions was an accurate representation of the plan of study completed by the average graduate of the program.

It was assumed that free electives on the study plan are not used for technical study, but rather for general education, and for the purposes of this study, courses in basic computer science, such as basic introductions to FORTRAN or BASIC language programming, were considered to be related technical courses instead of mathematics courses because of the close relationship of the discipline of computer science to modern electronics technology.

For the purposes of this study, the terms "baccalaureate" and "four-year" are used interchangeably.

Selection of the Subjects

The ultimate goal of this study was to include every four-year degree program in electronics technology offered within the United States at the time of the study. The Technician Education Yearbook (17) (18) and the College Blue Book (19) were primary sources of the names and addresses of colleges offering such programs. Other sources included ECPD literature, and various articles describing such programs, and these have been previously cited.

Each of the institutions found through the above search were contacted through its electronics technology department chairman. A first

mailing requested curricular information only. A second mailing included the questionnaire, and another request for any of the required curricular information which was not sent as previously requested. A third mailing was sent, similar to the second, to solicit information from those institutions which still did not respond.

Those institutions which would still not respond were sent a post card reminder in a fourth and final attempt. Those institutions which did not respond to any of the above requests, or responded with incomplete information were dropped from the study. Institutions which did not return the questionnaire, but sent the proper curriculum information were not dropped from the study, as the questionnaire data was not used in the manipulative-cognitive ranking of the programs.

Those institutions which indicated that they did not have a program which would fit the definition of "electronics technology" as previously stated in this study were also dropped. The number of institutions falling within this category was subtracted from the number of institutions contacted so that it would not affect the return rate of the questionnaires, as those questionnaires from non-electronics technology curricula were not used in the analysis of correlation. All of the questionnaires returned which indicated opinions of the use of definitions were used in that analysis.

Development of the Instrument

A questionnaire was used to obtain information not available from any other source. (A copy of this questionnaire is included in Appendix B.) The questionnaires were sent to the department chairmen of the department in each institution providing the program studied. They

were asked if their department actually offered a program, and they were asked for the actual title of the degree they offered. Other sources of information, including the college catalogs were often vague on this point.

The department chairmen were also asked to indicate the entry-level wage and job position titles of recent graduates. Also, their knowledge of the definitions within the discipline was queried. The entire information section of the questionnaire consisted of only six questions. A supplement to the questionnaire was included on the reverse side and was subsequently enumerated. The department chairmen were asked if they would like to receive a completed copy of the report. This was included because several department chairmen had requested a copy prior to the development of the instrument. Several blank lines were also included on the reverse side within which the respondents could include any remarks they might have. The subject of this response was not defined, and was optional.

Collection of the Data

Upon receipt of information from the institutions, a file was kept on each. The responses from the questionnaires was recorded as well as

1. a copy of the study plan, rearranged to delineate the courses into the five major subject areas: general education, mathematics, science, related technical, and technical;
2. the total number of credit hours devoted to each area, (quarter hours were converted to credit hours by multiplying by +0.6666);
3. the percentage of the total credit-hour workload devoted to each of the five major subject areas;

4. the total number of credit hours (or quarter hours) required for the completion of the degree;
5. the minimum number of laboratory hours required for the completion of the degree, (total of required technical laboratory plus the minimum elective technical laboratory);
6. the number of available "state-of-the-art" courses, including courses in modern digital electronics, minicomputers, microcomputers and microprocessors.

These six enumerated parameters were used in the manipulative-cognitive ranking of the institutions. The questionnaire data was used to determine the correlation between the graduate wage and position status, and the position of the program within the rank spectrum. The questionnaire data was also used to determine the use of uniform definitions within education and industry.

A summary of all of this data, excluding the questionnaire definition responses, is included in Appendix C, the curriculum data sheets.

Analysis of the Data

The analysis of the data was divided into three parts. The first analysis completed was the ranking of the institutions on the scale of manipulative-cognitive content. It was a linear scale, divided into standard deviation units. The second analysis was included to determine if a correlation existed between graduate status (wage and position) and the position on the scale of the program which produced the graduate. The third analysis used the responses of the department chairmen to determine if uniform definitions existed within their field, and if they believed that they were being used in education and in industry.

Ranking of the Institutions

In order to rank the institutions, a scale was first generated. This scale is divided into standard deviation units and is relative to the average of all of the institutions studied. Any deviation from the average by any of the parameters considered for a program tended to push that program away from the center of the scale towards either end of the spectrum. Parameter deviations which tend to produce a program which is more cognitive than the average were assigned a positive value, and those deviations which tend to produce a program which is more manipulative in content than the average were assigned a negative value.

In order to produce the number used in the ranking, eight program parameters were compared with the respective parameter average of all of the programs studied.

Five of the eight parameters were considered as positive: that is, an overabundance of these would tend to produce a more cognitive program and are:

1. parameter number 2: percentage of mathematics courses
2. parameter number 3: percentage of science courses
3. parameter number 5: percentage of technical courses
4. parameter number 6: total number of credit hours in program
5. parameter number 8: number of "state-of-the-art" courses.

Three of the eight parameters were considered as negative: that is, an overabundance of these would tend to produce a more manipulative program and are:

1. parameter number 1: percentage of general education courses
2. parameter number 4: percentage of related technical courses
3. parameter number 7: percentage of minimum laboratory hours.

The average value for each of the parameters is simply the arithmetic mean of the sum of all of the institutions' parameter values.

This arithmetic mean can be expressed as:

$$\bar{X}_n = \frac{\sum x_n}{N}$$

where n is the parameter being analyzed, x is the value of the parameter for each institution, and N is the number of institutions. Since there were eight parameters, there were eight values of \bar{X} to be considered.

Once the average value of a particular parameter was established, the deviation from that average was calculated for each of the institutions. This was done using a Z-score similar to that previously discussed. This parameter deviation can be expressed as:

$$\sigma_{tn} = \frac{j(x_n - \bar{X}_n)}{\sigma_n}$$

where σ_n is the standard deviation of $\sum x_n$ and j is the direction on the spectrum in which movement would take place for an increase in that parameter. For example, if the absolute value of the parameter x_n for general education was larger than the average value, \bar{X}_n , then the magnitude, j , would be assigned a negative sign (-1) because an overabundance of general education in the program would tend to drive the program towards the negative end. The magnitude, j , is positive for parameters 2, 3, 5, 6, and 8 as listed on page 19, and negative for parameters 1, 4, and 7.

Each of the values of parameter deviation, σ_{tn} , was recorded on the curriculum data sheets contained in Appendix C, in the column labeled "deviation". The total deviation from the average of the program was then calculated by simply adding all of the parameter deviations for the institution. This value, $\sum \sigma_t$, was recorded on the data sheet and used in the ranking of the institutions. The more positive the arithmetic

value of the total, the more cognitive the program.

Rank-Status Correlation

The second part of the analysis was to determine if there was any correlation between the rank of the program on the manipulative-cognitive scale and the graduate status of the students, including the average starting salary and job position title obtained by students upon graduation. This was done using simple linear correlation (20, p. 261).

First, the total deviation of the graduate status of the program graduates was completed. This was done in the same manner as the total program deviation, $\Sigma\sigma_t$, and is referred to as the total status deviation and symbolized as $\Sigma\sigma_s$. The total status deviation is calculated in the same manner as the total program deviation, using three parameters which were supplied from the questionnaires. They are 1) the percentage of graduates who enter engineering positions upon graduation, 2) the percentage of graduates who enter technician positions, and 3) the average monthly starting salary of the program graduates. The value of the magnitude, j , is positive for parameters 1 and 3, and negative for parameter 2.

The correlation between the program deviation and the status deviation can be computed using the product moment correlation defined by the equation:

$$r = \frac{\text{cov}(x,y)}{\sigma_x \sigma_y}$$

where \bar{X} and σ_x are the mean and standard deviation, respectively, of $\Sigma\sigma_t$, and \bar{Y} and σ_y are the corresponding parameters for $\Sigma\sigma_s$.

The covariance between $\Sigma\sigma_t$ and $\Sigma\sigma_s$, symbolized in the above

equation as $\text{cov}(x,y)$, can be calculated by the equation:

$$\text{cov}(x,y) = \frac{\sum_{i=1}^k (x_i - \bar{X})(y_i - \bar{Y})}{k}$$

The value of the correlation coefficient, r , was compared with a coefficient table of significance (21) to determine the magnitude and significance level of the correlation between the two variables.

Use of Definitions

The third analysis completed in this report was designed to determine if adequate definitions of the title, required education and job responsibilities of the technologist actually existed, and if education and industry use those definitions.

In the questionnaire three questions were asked of the department chairmen. The first asked if adequate definitions of the title, required education and job responsibilities actually existed at the time they answered the questionnaire. The second and third question asked if industry differentiated between the technician, technologist and engineer in hiring practices and policies. The answer to these two questions indicated whether the educators believed that these definitions are being used in industry.

In order to reach a conclusion as to whether or not the definitions exist and are being used, a simple majority decision by the program department chairmen was used, and supported by comments added by the respondents.

Summary

Data was collected from as many institutions offering four-year electronics technology programs as possible by making a maximum of four requests for information from those institutions not responding. The data consisted of a questionnaire, a copy of the program study plan, and course descriptions of the technical courses from each institution that was studied.

The data was analyzed in three steps in order to fulfill the objectives of the study. First, the institutions were ranked on a linear scale of manipulative versus cognitive content by using a Z-score with a score magnitude determined by the tendency of deviation towards the ends of the spectrum. Second, a rank-status correlation was completed using the product moment correlation technique. Third, determination of whether the educators who were contacted believed that uniform definitions of "technologist" are being used in education and industry. This determination was made from a majority decision from the respondents.

CHAPTER IV

RESULTS

Return Rates

All of the information which was used to analyze the individual programs was obtained through mail requests to the department chairmen of the programs surveyed. The information received was divided into two subject areas: the questionnaires and the curriculum data. The questionnaire was divided into two subject areas, graduate salary and graduate job position title information.

Of the 121 colleges, 26 did not respond to the requests for information with useful data or did not respond at all. This represents an overall return rate of 78.5%. A total of 38 colleges responded with programs which did not fall within the definition of electronics technology as being used in this study. Of those 38, 28 programs were offered which were programs in industrial electronics, 4 were electronics technology programs, but were being taught as upper division (last two years of study) courses only. The data received from these programs could not be used because upper division requirements are different from the requirements of full four-year programs. The remaining 6 programs were in various other disciplines such as general technology or education. This left 57 colleges with programs in electronics technology which responded with useful information.

Of the 57 colleges included in the study, 52 returned the question-

naires. Of those 52, only 35 indicated the graduate salary information. This represents a return rate of 91.2% of the questionnaires from the institutions being studied, but only 61.4% included graduate salary information.

Data Summary

The data used in this study fell into the same three categories as described in the previous data analysis description: ranking, rank-status correlation and use of definitions.

Ranking of the Institutions

In order to provide the institutional rankings, each program was compared to the mean of all of the programs using a Z-score technique in which the difference between the program parameter and the average parameter is divided by the standard deviation of all of the parameters. Eight parameters were used to provide data for the rankings, (Table I).

TABLE I
RANKING PARAMETER SUMMARY

Parameter Number, n	Parameter	Mean \bar{X}	Standard Deviation, σ
1.	General Education Courses	28.700	6.130
2.	Mathematics Courses	10.393	2.505
3.	Science Courses	8.664	3.091
4.	Related Technical Courses	15.353	6.863
5.	Technical Courses	36.824	7.012
6.	Total Credit Hours	128.509	6.110
7.	Minimum Laboratory Hours	6.815	3.223
8.	State-of-the-Art Courses	2.867	1.909

The mean and standard deviation figures were calculated to more significant figures than the actual data in order to retain the accuracy of that data. These numbers, and all of the numbers described as data in this report are rounded off in order to generate the least significant digit. During all calculations, however, 13 significant digits were maintained at all times. This will be evident if the data presented here is recalculated. If this is done, round-off error will result.

Using the data of Table 1, the parameter deviations, σ_{tn} , were calculated. The resulting data is indicated on the individual data sheets in Appendix C under the column labeled "deviation". The sum of the parameter deviations, $\Sigma\sigma_t$, is indicated as the total deviation.

When the programs were ranked in order of the variable, $\Sigma\sigma_t$, the manipulative-cognitive scale was produced. Those institutions with values of $\Sigma\sigma_t$ greater than zero approach the more cognitive end, and those with values less than zero approach the more manipulative end. Table II illustrates this ranking, showing the position in the rank, the institution name, and the parameter sum $\Sigma\sigma_t$.

It would be useful to repeat at this point that this ranking does not label a particular program as "good" or "bad" but rather provides an indication of the relationship of the program to the others on this scale.

Those programs with a parameter sum greater than +2.000 showed a tendency to have a greater percentage of mathematics and science and a lower percentage of related technical courses than the average. This indicated that the philosophy of those programs was leaning towards that of an engineering program. Less emphasis is given to providing a broad technological background and more is given to the cognitive level.

TABLE II
 INSTITUTIONS RANKED BY THE COGNITIVE LEVEL OF
 THEIR FOUR-YEAR DEGREE PROGRAM IN
 ELECTRONICS TECHNOLOGY

Position No.	Institution Name	Total Deviation
1.	Weber State College	+6.192
2.	Arizona State University	+5.415
3.	Metropolitan State College	+5.297
4.	New York Institute of Technology	+4.838
5.	Mississippi State University	+4.508
6.	University of Pittsburg, Johnstown	+3.341
7.	University of South Dakota, Springfield	+3.312
8.	University of Southern Colorado, Pueblo	+3.284
9.	Bluefield State College	+3.153
10.	Louisiana Technical University	+3.152
11.	Milwaukee School of Engineering	+2.830
12.	Kent State University	+2.483
13.	Southern Technical Institute	+2.467
14.	Florida A & M University	+2.190
15.	Purdue University, W. Lafayette	+1.521
16.	Indiana University-Purdue University, Indianapolis	+1.440
17.	Bradley University	+1.376
18.	Kansas State College, Pittsburg	+1.151
19.	Old Dominion University	+1.053
20.	Brigham Young University, Provo	+1.025
21.	Purdue University, Calumet	+0.894
22.	Cogswell College	+0.808

TABLE II (CONTINUED)

Position No.	Institution Name	Total Deviation
23.	Oklahoma State University, Stillwater	+0.736
24.	Georgia Southern College, Statesboro	+0.635
25.	University of Alabama	+0.621
26.	University of Wisconsin, Parkside	+0.368
27.	University of Dayton	+0.233
28.	University of Maine, Orono	+0.162
29.	Oregon Institute of Technology	+0.148
30.	Temple University	-0.005
31.	University of Toledo	-0.017
32.	Missouri Western State College	-0.087
33.	Alabama A & M University	-0.099
34.	Western Kentucky University	-0.114
35.	Wichita State University	-0.260
36.	Montana State University, Bozeman	-0.313
37.	Southwest Minnesota State University	-0.426
38.	Purdue University, Fort Wayne	-0.494
39.	California State Polytechnic University, Pomona	-1.332
40.	University of Akron	-1.467
41.	Norfolk State College	-1.565
42.	Fairmont State College	-1.595
43.	Northern Illinois University	-1.820
44.	Lake Superior State College	-2.096
45.	Indiana State University, Terre Haute	-2.153
46.	Murray State University	-2.169

TABLE II (CONTINUED)

Position No.	Institution Name	Total Deviation
47.	LeTourneau College	-2.403
48.	University of Houston	-2.444
49.	Wayne State University	-2.695
50.	Youngstown State University	-2.718
51.	Northern Arizona State University	-2.720
52.	California Polytechnic State Univ., San Luis Obispo	-3.159
53.	Northrup University	-3.334
54.	Trenton State College	-3.371
55.	Nicholls State University	-4.475
56.	Memphis State University	-4.902
57.	Bowling Green State University	-10.065

Those programs with a parameter sum less than -2.000 showed a tendency to have a greater percentage of related technical and general education courses than the average. Those programs tended to approach a philosophy of building wide educational scope in its graduates rather than placing emphasis on the field of electronics technology. This was also often done at the expense of the level of mathematics or science received by the student.

Programs with a parameter sum between +2.000 and -2.000 had little in common. Many programs deviated significantly in one parameter only to be offset by a similar deviation of opposite magnitude in another parameter, resulting in an apparent average program total.

Rank-Status Correlation

The second analysis completed on the data was designed to determine if there is any statistical correlation between the rank of the college indicated in Table II and the salary and position status of the program graduates. Thirty-five of the fifty-seven institutions provided data concerning the starting salary and position of its graduates. Questions three and four on the questionnaire pertained to this data. Question three asked for the percentage of graduates who enter positions with titles of engineer, technologist, technician and craftsman. The positions of engineer, technician and craftsman were used in the determination of the correlation, and the titles of technician and craftsman were added together to produce a single parameter, the technician. Because an overabundance of technician graduates would indicate a program that tends to be a technician program, the parameter was negative. For the same reason, the engineering parameter was positive. The third parameter, the average monthly starting salary was also positive. Table III summarizes these three parameters.

TABLE III
GRADUATE STATUS PARAMETER SUMMARY

Parameter Number, n	Parameter	Mean	Standard Deviation
1.	Percentage Graduate Engineers	55.33	24.563
2.	Percentage Graduate Technicians	13.20	15.142
3.	Average Monthly Starting Salary	\$1194.88	104.872

When the product moment correlation was completed, only the 35 institutions which forwarded the graduate status information were considered. When the correlation was calculated, a correlation coefficient of -0.276 was realized. Since there were 33 degrees of freedom (n-2), a significance level of 0.105 was found through the interpolation of the values found using a coefficient significance chart (22, p. 382).

Use of Definitions

Questions five, six and seven were designed to determine if the educators believed that there were adequate definitions of the title, required education and job responsibilities of the "technologist", and if industry uses such a definition in hiring practices and policies. The results of these questions is summarized in Table IV.

TABLE IV
ANSWERS TO QUESTIONNAIRE QUESTIONS 5, 6, AND 7

Question	Number of Responses	
	YES	NO
5. In your judgement, do adequate definitions of the title, required education and job responsibilities of the "technologist" exist?	14	38
6. In your judgement, does industry discriminate between the technician and the technologist in hiring practices and policies?	33	14
7. In your judgement, does industry discriminate between the engineer and the technologist in hiring practices and policies?	42	9

Range of the Data

Another parameter which was considered in determining if there was a significant diversity in the programs was the range of the data.

Table V summarizes that data range.

TABLE V
RANGE OF RANKING AND GRADUATE STATUS PARAMETERS

Parameter	High	Low	Range
General Education Courses	43.6%	17.1%	25.5%
Mathematics Courses	15.2%	4.4%	10.8%
Science Courses	17.2%	3.8%	13.4%
Related Technical Courses	30.5%	2.4%	28.1%
Technical Courses	49.6%	19.4%	30.2%
Total Credit Hours	140.0	101.0	39.0
Minimum Laboratory Hours	21.2%	3.2%	18.0%
State of the Art Courses	9.0	0.0	9.0
Percentage Graduate Engineers	100.0%	5.0%	95.0%
Percentage Graduate Technicians	50.0%	0.0%	50.0%
Average Monthly Salary	\$1400.00	\$900.00	\$500.00

Degree Titles

The degree title of each program is indicated on the curriculum data sheets, and are summarized in Table VI.

Results of Analysis

The objectives of this study were stated in Chapter I. In the completion of each objective, data was received and analyzed. The results of the analysis will be described in terms of those objectives,

and will be subsequently enumerated.

TABLE VI
TITLES OF DEGREES OFFERED BY RESPONDING INSTITUTIONS

Degree Title	No. of Degrees
Bachelor of Electrical Engineering Technology	1
Bachelor of Engineering Technology	
Electrical/Electronic Major	1
Electronics Engineering Technology Major	3
Bachelor of Science	
Electronics Engineering Technology Major	1
Electronics Technology Major	1
B.S. in Applied Science	
Electrical Engineering Technology Major	1
B.S. in Electrical and Electronics Engineering Technology	1
B.S. in Electronics Engineering Technology	3
B.S. in Electronics Technology	3
B.S. in Electrical/Electronics Engineering Technology	2
B.S. in Electrical Engineering Technology	13
B.S. in Electrical Technology	3
B.S. in Engineering Technology	
Electrical Engineering Technology Major	7
Electrical Technology Major	1
Electronics Major	4
Electronics Technology Major	1
B.S. in Technology	
Electronics Engineering Technology Major	2
Electronics Technology Major	3
Bachelor of Technology	
Electronics Engineering Technology Major	5

1. The first objective was to determine which institutions in the United States offered a four-year degree program in electronics technology during the 1976-1977 academic year. 121 colleges were found which offered four-year degrees in electronics in non-engineering fields. Of those, 57 were found to offer programs in electronics technology as defined in this study.

2. The second objective was to document the titles of the degrees offered. The degree titles were summarized, and were very similar. No indication was given in the titles which would describe any program differences from other programs.

3. The third objective was to develop a set of criteria from which these programs could be compared and evaluated. The criteria consisted of a Z-score analysis of eight curriculum parameters. When the Z-score analysis was used, it was possible to compare the programs on a cognitive level scale.

4. The fourth objective was to document and summarize the content of the programs, and rank them on a scale based upon cognitive content.

Each program was summarized in terms of the five major course areas with the percentage of the total curriculum devoted to each area calculated.

5. The fifth objective was to determine if there was any correlation between the employment status of the program graduates and the position of the program on the cognitive scale. When a product moment correlation method was used, a negative correlation coefficient was realized.

6. The sixth objective was to determine if there was a significant diversity in the programs. The extent of the diversity was shown in two

ways. First, the diversity was expressed in terms of standard deviation units, calculated by adding the deviation from the mean of eight program parameters. The resulting values ranged from -10.065 to +6.192. This means that the average parameter ranged from 1.258 standard deviations below the average for the least cognitive program to 0.774 standard deviations above the mean for the most cognitive. Second, the diversity was indicated in terms of the range of the parameters .

7. The last objective was to determine if adequate definitions of the title, education and job responsibilities of the "technologist" were used in education and in industry. A majority of educators did not believe that adequate definitions existed (73.0%). Most of the educators do agree that industry does discriminate between the technologist and the technician (70.2%), and between the technologist and the engineer. This apparent contradiction may have been due to a difference in opinion between employers and educators concerning definitions of the "technologist" in hiring policies and practices. No employers were contacted in this analysis preparation.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The problem with which this study was concerned was to determine if a significant diversity exists in the four-year degree programs in electronics technology offered within the United States. This study was also concerned with whether or not uniform definitions of the title, job responsibilities and required education of the "technologist" actually existed in education and in industry, and if so, were they used by industry in employment policies and practices.

Summary

The purpose of this study was to compare the four-year degree programs in electronics technology offered by institutions within the United States. Emphasis was based on a comparison of the curricula, the entry-level wage and job title of the program graduates, and the opinion of the educators involved with the program development concerning the definition of the requirements of technologist education. This purpose can be delineated by the following specific objectives:

- a. To determine which institutions in the United States offered a four-year degree program in electronics technology during the 1976-1977 academic year.
- b. To document the titles of the degrees offered by those colleges.
- c. To develop a set of criteria from which four-year degree programs in electronics technology can be compared and evaluated.

- d. To document and summarize the content of the baccalaureate electronics technology curriculum offerings available from those institutions and rank them on a cognitive level scale.
- e. To determine the correlation between the job title and entry level wages of the graduates of the programs and the position on the cognitive scale of the institution providing the graduate.
- f. To determine if a significant diversity in the baccalaureate degree programs in electronics technology actually existed.
- g. To determine if, in the opinion of the educators contacted, adequate definitions of the title, education, and job responsibilities of the technologist were used in education and in industry.

In order to fulfill these objectives, a search was made to determine which institutions in the United States offered four-year degree programs in electronics technology. Using previously cited references, 121 institutions were found which offered four-year technical programs in electronics. These colleges were contacted, and were asked to return curricular information and a questionnaire. Of those institutions, 26 did not respond. Of the remaining 95, 38 responded with programs which did not fit the definition of electronics technology as stated in Chapter I. The remaining 57 institutions were included in the study.

The curricula were delineated into eight parameters in order to assign them a position on a cognitive scale. By comparing each program with the average of all of the programs, the institutions were ranked.

A similar analysis was completed on the status of the program graduates. Three parameters were used in this determination. Then, a test of correlation was completed on the two subjects: the rank of the institutions, and the employment status of the program graduates.

In order to determine if adequate definitions within the discipline were used in education and industry, a questionnaire was used. The department chairmen of the programs studied were asked if these defini-

tions existed. They were also asked to indicate if industry treats technicians, technologists and engineers differently in hiring practices and policies. A simple majority decision was used in this determination.

Fifty seven institutions were found which offered a four-year degree program in electronics technology. Each program was summarized, including the degree title, and the values of the parameters calculated. The institutions were then ranked on a cognitive scale.

Using the product moment correlation technique it was found that there was a negative correlation between the cognitive level of the program and the graduate employment status of the program graduates.

It was also found that a diversity did exist in the programs as shown by the range of the parameters.

As a result of the questionnaire survey it was found that adequate definitions of the title, job responsibilities and required education of the "technologist" did not exist. However, the majority of educators indicated that industry did discriminate between the technician, technologist and engineer in hiring practices and policies.

Conclusions

The design of this study included analyses of several parameters. These analyses resulted in the determination of a ranking of the programs on a cognitive scale, a correlation determination between the job status of the program graduates and the cognitive level of the program, and an opinion concerning the existence of definitions in the field.

Ranking of the Institutions

It was found that institutions offering programs differed greatly

in cognitive level. Programs which ranked high on the list placed their emphasis on technical, mathematics and sciences courses. Those programs at the bottom of the scale placed their emphasis on general education, related technical courses and laboratory work. This shows that a diversity does exist in the programs offered within the country. It was also evident by examination of the degree titles that an employer would not know, on the basis of degree title, what the educational background of the employee was.

Rank-Status Correlation

The results of the correlation showed that there was a negative correlation between the cognitive level of the programs and the employment status of the program graduates. A correlation coefficient of $-.27$ and a significance level of 0.105 indicated that there was a probability of 0.895 that the correlation between the two variables was not due to chance alone. Therefore it can be stated that the more manipulative programs are probably producing some graduates who obtain employment at higher levels of title and compensation than do some from the more cognitive programs.

Use of Definitions

The educators indicated that adequate definitions of the title, job responsibilities and educational requirements did not exist. If there were not adequate definitions in education and industry, industry could not define the existence of the "technologist", and could not employ him properly. This is also shown by the percentages of graduates who enter engineering positions upon graduation. Of the programs, an average of

55.3% of the graduates entered engineering positions.

However, the educators did indicate that industry discriminates between the technician, technologist and engineer in hiring policies and practices. If definitions did not exist, this discrimination would not be possible. It must again be noted that this response was in the best judgement of educators and not employers.

In the unsolicited comments provided by the educators, many agreed on one point: many employers hire technologists for engineering positions because they are able to do the same job as the engineer, and the employer does not have to pay the technologist as high a salary. This could indicate that the position the employer is filling is not really an engineering position. It could also indicate a lucrative hiring practice which can only frustrate attempts at defining the proper job responsibilities of the technologist.

Summary

In summary, it was found that many institutions throughout the country offer four-year degree programs in electronics technology. They vary widely in scope and breadth, from programs which emphasize the cognitive level to those which emphasize the non-technical background.

Definitions describing the "technologist" were not being used by education and industry, and without such definitions, and with such a diversity of educational programs, it was evident that industry could not and did not know what the background of its technologist hires was, and in many cases may have employed them improperly.

Recommendations

As a result of this study, the following recommendations are offered:

1. It is first recommended that adequate and realistic definitions be provided by a responsible institution which describe the title, job responsibilities and educational requirements of the technologist. When such a task is completed, both educators and employers must be educated in the philosophy of technical education, using those definitions.

2. It is further recommended that those institutions which offer programs which vary greatly from the average, as established by this study, review the philosophy and objectives of their program.

3. It is recommended that a study be conducted on technologist education as a whole, instead of focusing on a particular program area. This study unveiled a problem which existed in electronics that may not have existed in other technologies. If this problem exists in all technologies it is imperative that educators and employers seek to find a solution. Only if this is done, can education best deliver to employers a product which can best fulfill the needs of both the employer and the employee.

4. It is finally recommended that a model curriculum be designed from which educators can base their programs. Model curricula examples are available for the two-year technical degrees, and are often used. Such a model would be useful in order to define "electronics technology" and the educational background that is required to support it.

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APPENDIX A

LIST OF SCHOOLS

Contained in this appendix is a list of colleges and universities contacted in this study. To the right of those institutions not included in this study is a brief explanation as to why it was deleted. If the institution does not offer a program which is suitable to this study, the words "No Program" are indicated. If the institution did not respond to requests for information the words "No Response" are indicated.

1. Alabama A & M University
Huntsville, AL 35762
2. Appalachian State University
Boone, NC 28608 No Response
3. Arizona State University
Tempe, AZ 85281
4. Bluefield State College
Bluefield, WV 24701
5. Boston University
Boston, MA 02215 No Program
6. Bowling Green State University
Bowling Green, OH 43403
7. Bradley University
Peoria, IL 61625
8. Brigham Young University
Provo, UT 84601
9. California Polytechnic State University
San Luis Obispo, CA 93401
10. California State Polytechnic University
Pomona, CA 91768
11. California State University
Chico, CA 95926 No Program
12. Capitol Institute of Technology
Kensington, MD 20795 No Response
13. Central Michigan University
Mount Pleasant, MI 48858 No Program

14. Central Missouri State University
Warrensburg, MO 64093 No Program
15. Central Washington University
Ellensburg, WA 98926 No Program
16. Clemson University
Clemson, SC 29631 No Response
17. Cleveland State University
Cleveland, OH 44155 No Response
18. Cogswell College
San Francisco, CA 94108
19. Columbia College
Los Angeles, CA 90038 No Response
20. Community College of Philadelphia
Philadelphia, PA 19107 No Response
21. Control Data Corporation
Honolulu, HA 96819 No Response
22. DeVry Institute of Technology
Chicago, IL 60618 No Response
23. DeVry Institute of Technology
Dallas, TX 75601 No Response
24. Fairleigh Dickinson University
Teaneck, NJ 07666 No Program
25. Fairmont State College
Fairmont, WV 26554
26. Ferris State College
Big Rapids, MI 49307 No Program
27. Florida A & M University
Tallahassee, FL 32307
28. Florida International University
Miami, FL 33144 No Program
29. Francis Marion State College
Florence, SC 29501 No Program
30. Georgia Southern College
Statesboro, GA 30458
31. Grambling State University
Grambling, LA 71245 No Response

32. Henderson Community College
Henderson, KY 42420 No Program
33. Illinois State University
Normal, IL 61761 No Program
34. Indiana Northern University
Gas City, IN 46993 No Program
35. Indiana State University
Terre Haute, IN 47809
36. Indiana University-Purdue University
Fort Wayne, IN 46805
37. Indiana University-Purdue University
Indianapolis, IN 46202
38. Kansas State College
Pittsburg, KA 66762
39. Kean College
Union, NJ 07083 No Program
40. Kent State University
Kent, OH 43403
41. Lake Superior State College
Sault Saint Marie, MI 49783
42. Lamar University
Beaumont, TX 77710 No Program
43. LeTourneau College
Longview, TX 79336
44. Louisiana Technical University
Ruston, LA 71270
45. Lowell Technical Institute
Lowell, MA 01854 No Response
46. Memphis State University
Memphis, TN 38152
47. Metropolitan State College
Denver, CO 80204
48. Milwaukee School of Engineering
Milwaukee, WI 53201
49. Mississippi State University
Mississippi State, MS 39762

50. Mississippi Valley State College
Itta Bena, MS No Program
51. Missouri Western State College
St. Joseph, MO 64507
52. Montana State University
Bozeman, MT 59715
53. Montclair State College
Upper Montclair, NJ 07043 No Program
54. Murray State University
Murray, KY 42071
55. New Jersey Institute of Technology
Newark, NJ 07012 No Response
56. New York Institute of Technology
Old Westbury, NY 11568
57. Nicholls State University
Thibodaux, LA 70301
58. Norfolk State College
Norfolk, VA 23504
59. North Carolina A & T University
Greensboro, NC 27411 No Program
60. Northeastern Missouri State University
Kirksville, MO 63501 No Program
61. Northern Arizona University
Flagstaff, AZ 86001
62. Northern Illinois University
DeKalb, IL 60115
63. Northern Michigan University
Marquette, MI 49855 No Response
64. Northrup University
Inglewood, CA 90306
65. Oklahoma State University
Stillwater, OK 74074
66. Old Dominion University
Norfolk, VA 23508
67. Olivet Nazarene College
Kankakee, IL 60901 No Program

68. Oregon Institute of Technology
Klamath Falls, OR 97601
69. Pennsylvania State University
Middletown, PA 17057 No Program
70. Prarie View A & M College
Prarie View, TX 77445 No Response
71. Purdue University, Calumet Campus
Hammond, IN 46323
72. Purdue University
W. Lafayette, IN 47907
73. Renssalaer Polytechnic Institute
Troy, NY 12181 No Program
74. Rochester Institute of Technology
Rochester, NY 14623 No Program
75. Roger Williams State College
Bristol, RI 02809 No Response
76. Savannah State College
Savannah, GA 31404 No Response
77. South Carolina State College
Orangeburg, SC 29115 No Response
78. Southeastern Massachusetts University
N. Dartmouth, MA 02747 No Response
79. Southeastern Oklahoma State University
Durant, OK 74701 No Program
80. Southern Illinois University
Carbondale, IL 62932 No Response
81. Southern Technical Institute
Marrietta, GA 30060
82. Southern Utah State College
Cedar City, UT 84720 No Response
83. Southwest Minnesota State University
Marshall, MN 56258
84. Soutwest Missouri State University
Springfield, MO 65802 No Program
85. Spring Garden College
Chestnut Hill, PA 19118 No Response

86. State University of New York
Binghamton, NY 13901 No Program
87. Temple University
Philadelphia, PA 19122
88. Texas Southern University
Houston, TX 77004 No Response
89. Trenton State College
Trenton, NJ 06825
90. Troy State University
Troy, AL 36081 No Response
91. Tuskegee Institute
Tuskegee, AL 36088 No Program
92. University of Akron
Akron, OH 44325
93. University of Alabama
University, AL 35486
94. University of Alaska
Anchorage, AK 99504 No Program
95. University of Dayton
Dayton, OH 45469
96. University of Houston
Houston, TX 77004
97. University of Kansas
Lawrence, KA 66045 No Program
98. University of Maine
Orono, ME 04473
99. University of Nebraska
Lincoln, NB 68503 No Response
100. University of New Hampshire
Durham, NH 03824 No Program
101. University of North Dakota
Grand Forks, ND 58202 No Program
102. University of Pittsburg
Johnstown, PA 15904
103. University of South Alabama
Mobile, AL 36688 No Program

- | | | |
|------|---|-------------|
| 104. | University of South Carolina
Columbia, SC 29208 | No Program |
| 105. | University of South Dakota
Springfield, SD 57062 | |
| 106. | University of Southern Colorado
Pueblo, CO 81001 | |
| 107. | University of Tennessee
Martin, TN 38327 | No Response |
| 108. | University of Toledo
Toledo, OH 43606 | |
| 109. | University of Wisconsin, Parkside
Kenosha, WI 53140 | |
| 110. | University of Wisconsin, Stout
Menomonie, WI 54751 | No Program |
| 111. | Virginia Polytechnic Institute
Blacksburg, VA 24061 | No Program |
| 112. | Virginia State College
Petersburg, VA 23803 | No Program |
| 113. | Wayne State University
Detroit MI 48202 | |
| 114. | Weber State College
Ogden, UT 84403 | |
| 115. | Western Kentucky University
Bowling Green, KY 42101 | |
| 116. | Western Michigan University
Kalamazoo, MI 49008 | No Program |
| 117. | Western Washington State College
Bellingham, WA 98225 | No Program |
| 118. | West Virginia Institute of Technology
Montgomery, WV 26554 | No Program |
| 119. | West Virginia State College
Institute, WV 25112 | No Response |
| 120. | Wichita State University
Wichita, KS 67208 | |
| 121. | Youngstown State University
Youngstown, OH 44503 | |

APPENDIX B

THE QUESTIONNAIRE

BACCALAUREATE DEGREE PROGRAMS IN ELECTRONICS TECHNOLOGY

A QUESTIONNAIRE

The following is intended as a questionnaire for the provision of information pertaining to the four-year electronics technology program offered by your institution. Although specific questions are asked which require particular data, it is hoped that this general framework will allow and encourage the reporting of additional information about your program as you believe important.

All questions refer to your institution's four-year degree program in electronics technology (ET) only.

1. Does your institution offer a four-year degree program in Electronics Technology?

Yes

No Comment? _____

If the answer is No, you need go no further. However, please return this questionnaire so that your institution can be dropped from the study.

2. What is the actual title of the degree conferred to students in your ET program?

(Degree Title)

3. Please indicate, using approximate percentages, the proportions of your graduates who enter employment within the following position titles:

A. Engineer _____ %

B. Technologist _____ %

C. Technician _____ %

D. Craftsman _____ %

E. Other _____ % Specify Examples: _____

4. What is the approximate average starting monthly salary paid to graduates of your program?

Average Salary \$ _____

5. In your judgement, do adequate definitions of the title, required education and job responsibilities of the "technologist" exist?

Yes

No Comment? _____

6. In your judgement, does industry discriminate between the technician and the technologist in hiring policies and practices?

Yes

No Comment? _____

7. In your judgement, does industry discriminate between the engineer and the technologist in hiring policies and practices?

Yes

No Comment? _____

8. Would you like to receive a copy of the completed report? You will be charged only for the cost of duplicating and postage, and the price will be quoted to you in advance of mailing.

Yes

No

If So, please complete the following:

Name _____ Title _____

Department _____

Institution _____

Address to which report should be sent if different than that indicated at the beginning of the questionnaire:

9. In addition to this questionnaire, please forward to me ONLY those items checked below.

A. A copy of your study plan (example)

B. Course descriptions

C. Nothing (I have the required information)

10. Additional comments?

APPENDIX C

CURRICULUM DATA SHEETS

Alabama A & M University

B.S. in Electrical/Electronics Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
Technology Orientation	2	Mechanical Drawing	3
Communication Skills 1-2	6	Technical Programming	3
Physical Education	4	Industrial Processes	3
Humanities	3	Electronic Drafting	3
World History 1-2	6	Statics	3
Technical Report Writing	2		
General Speech	2	<u>Technical</u>	
Industrial Psychology	3		
Principles of Economics	3	Circuits 1-2-3	12
Business & Legal Practice	2	Electronic Instruments	3
General Education Electives	6	Electronic Devices	4
		Electromagnetic Theory	3
<u>Mathematics</u>		Senior Seminar 1-2	4
College Algebra & Trigonometry	6	Industrial Electronics	3
Analytical Geometry & Calculus	6	Technical Electives	12
<u>Science</u>			
General Chemistry	4		
General Physics 1-2	8		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	42 Hrs	33.8%	-0.702	
Mathematics	14 Hrs	11.3%	+0.362	
Science	12 Hrs	9.7%	+0.335	
Related Technical	19 Hrs	15.3%	-0.014	
Technical	41 Hrs	33.1%	-0.531	
Total Hours	124 Hrs	124.0	-0.369	Total Deviation
Minimum Laboratory	4 Hrs	3.2%	+0.563	
State of the Art	4 Courses	4.0	+0.297	-0.099

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 33

Arizona State University

B.S. in Electronic Engineering Technology

General Education

English Composition 1-2	6
Intro to Human Communications	3
University Adj & Survival	2
Elementary Business Enterprise	3
Use of the Library	1
Principles of Economics	3
Principles of Management	3
Technical Report Writing	3
General Elective	1

Mathematics

College Algebra & Trigonometry	4
Calculus for Appl Science 1-2	6
Applied Calculus	3
Applied Linear Algebra	3

Science

General Physics 1-2	6
Elementary Atomic Physics	3

Related Technical

Manufacturing Proc & Mat	3
Technical Graphics	2
Technical Problem Solving	3
Computer Programming	2
Applied Electrical Science	4
Related Technical Elective	2

Technical

Electronic Circuits 1-2-3	11
Active Devices	3
Electrical Networks 1-2	6
Electronic Instruments	4
Digital Systems Principles	3
Communications Systems	3
Prin of Electronic Design 1-2	4
Approved Laboratory	4
Major Technical Emphasis	21
Technical Elective	4

Summary

Parameter	Quantity	Normal	Deviation	
General Education	25 Hrs	19.4%	+1.520	
Mathematics	16 Hrs	12.4%	+0.801	
Science	9 Hrs	7.0%	-0.538	
Related Technical	16 Hrs	12.4%	+0.430	
Technical	63 Hrs	48.8%	+1.708	
Total Hours	129 Hrs	129.0	+0.040	Total Deviation
Minimum Laboratory	10 Hrs	7.8%	-0.152	
State of the Art	9 Courses	9.0	+1.606	+5.415
Engineering Graduates		60.0%	+0.095	
Technician Graduates		40.0%	-0.885	
Average Monthly Salary		\$1300.00	+0.501	-0.289

Rank: 2

Bluefield State College

B.S. in Electrical Engineering Technology

General Education

Composition 1-2	6
Business Psychology	3
Technical Report Writing	3
English Elective	3
Socio-Humanistic Electives	12
General Education Electives	6

Mathematics

Computational Methods	1
Technical Mathematics 1-2	8
Technical Calculus	4
Analytic Geometry & Calc 1-2	8

Science

Technical Physics 1-2	8
General Chemistry	4

Related Technical

Engineering Drafting	3
Engineering Mechanics 1-2	8
Fortran Programming	3
Engineering Economy	3
Related Technical Electives	6

Technical

Electronics 1-2	8
AC & DC Machines	4
Circuit Analysis	3
Fundamentals of Computers	3
Microsystems	3
Servos & Television	4
Power Distribution	3
Control Systems	4
Semiconductors & Microwaves	4
Industrial Electronics	4
Advanced Circuit Analysis	3
Coordination of Elect Systems	3
Special Technical Topics	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	33 Hrs	23.9%	+0.790	
Mathematics	21 Hrs	15.2%	+1.919	
Science	12 Hrs	8.7%	+0.012	
Related Technical	23 Hrs	16.7%	-0.196	
Technical	49 Hrs	35.5%	-0.189	
Total Hours	138 Hrs	138.0	+0.777	Total Deviation
Minimum Laboratory	7 Hrs	5.1%	+0.267	
State of the Art	2 Courses	2.0	-0.227	+3.153
Engineering Graduates		5.0%	-1.025	
Technician Graduates		5.0%	+0.271	
Average Monthly Salary		\$1400.00	+0.978	+0.224

Rank: 9

Bowling Green State University

B.S. in Technology
Electronic Technology MajorGeneral Education

English	4
English Literature Elective	4
Speech 1-2	8
Sociology	4
Psychology	5
Social Science Electives	8
Physical Education	3
Economics	4
Marketing	4
Legal Studies	4
General Education Electives	17

Mathematics

Algebra & Trigonometry	5
Calculus	5

Science

Physics 1-2	10
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Related Technical

Engineering Graphics	4
Materials Processing 1-2	8
Foundations of Ind Engr Tech	3
Mechanization	4
Cybernetics	4
Construction Technology	4
Internships	15
Computer Science	5
Related Technical Elective	4

Technical

Electricity	5
Electronics	4
Instrumentation	4
Solid State Devices	4
Digital Computer Control	4
Computer Programming	4
Systems Programming	4
Computer Organization	4

Summary

Parameter	Quantity	Normal	Deviation	
General Education	79 QHrs	42.5%	-2.227	
Mathematics	10 QHrs	5.4%	-1.993	
Science	10 QHrs	5.4%	-1.056	
Related Technical	51 QHrs	27.4%	-1.756	
Technical	36 QHrs	19.4%	-2.485	
Total Hours	186 QHrs	124.0	-0.369	Total Deviation
Minimum Laboratory	9 QHrs	4.6%	+0.048	
State of the Art	3 Courses	2.0	-0.227	-10.065

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 57

Bradley University

B.S. in Electrical Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
English Composition	3	Basic Graphics	2
Business & Professional Speech	2	Fortran Programming	3
Physical Education	2	Manufacturing Processes	3
Principles of Psychology	3		
Introduction to Economics	3	<u>Technical</u>	
General Education Electives	27		
		Circuit Analysis 1-2	8
<u>Mathematics</u>		Electronics 1-2	8
College Algebra & Trigonometry	4	Energy Conversion	3
Technical Calculus 1-2-3	9	Digital Systems Technology	3
		System Concepts	3
<u>Science</u>		Electronic Measurements	3
Modern Physics	3	Industrial Electronics	3
Electrodynamics (Physics)	4	Transmission Fundamentals	3
		Senior Laboratory	2
		Technical Electives	21

Summary

Parameter	Quantity	Normal	Deviation	
General Education	40 Hrs	32.0%	-0.524	
Mathematics	13 Hrs	10.4%	+0.003	
Science	7 Hrs	5.6%	-0.991	
Related Technical	8 Hrs	6.4%	+1.305	
Technical	57 Hrs	45.6%	+1.252	
Total Hours	125 Hrs	125.0	-0.287	Total Deviation
Minimum Laboratory	4 Hrs	3.2%	+0.563	
State of the Art	3 Courses	3.0	+0.035	+1.356
Engineering Graduates		45.0%	-0.210	
Technician Graduates		5.0%	+0.271	
Average Monthly Salary		\$1400.00	+0.978	+1.039

Rank: 17

Brigham Young University, Provo

B.S. in Electronics Technology

General Education

English Composition 1-2	6
Health	2
American History	3
Humanities Electives	6
Physical Education	2
Social Science Electives	5
Religion 1-2	4
Religion Electives	10

Mathematics

Algebra & Trigonometry 1-2	6
Calculus 1-2	6

Science

General Physics	3
Physics Elective	3
Biological Science Electives	6

Related Technical

Computer Programming	3
Mechanical Technology	1
Computer Science Elective	3
Technical Orientation	1
Related Technical Electives	9

Technical

Direct Current Circuits	3
Alternating Current Circuits	4
Fabrication Techniques	3
Electronics 1-2-3	11
Troubleshooting	2
Minicomputer Applications	3
Digital Electronics 1-2	6
Control Systems	3
Linear Integrated Circuits	3
Real-Time Computer Sys 1-2	6

Summary

Parameter	Quantity	Normal	Deviation	
General Education	38 Hrs	30.9%	-0.346	
Mathematics	12 Hrs	9.8%	-0.237	
Science	12 Hrs	9.8%	+0.368	
Related Technical	16 Hrs	13.0%	+0.343	
Technical	45 Hrs	36.6%	-0.032	
Total Hours	123 Hrs	123.0	-0.451	Total Deviation
Minimum Laboratory	6 Hrs	4.9%	+0.298	
State of the Art	7 Courses	7.0	+1.082	+1.025
Engineering Graduates		40.0%	-0.312	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1208.00	+0.063	+0.867

Rank: 20

California Polytechnic State University, San Luis Obispo

B.S. in Engineering Technology
Electronics MajorGeneral Education

Freshman Composition	3
Social & Life Science Electives	9
American Government	3
American Democracy	5
Literature	4
Philosophy	3
Humanities	3
Physical Education	3
General Electives	9
Technical Report Writing	3
Industrial Management	4
Humanities or Social Sciences	3

Mathematics

College Algebra & Trigonometry	5
Technical Calculus 1-2-3	12

Science

Inorganic Chemistry	4
College Physics 1-2-3	12

Related Technical

Manufacturing Processes	5
Digital Computer Applications	2
Mechanical Technology	4
Material Mechanics	5
Thermodynamics	4
Fluid Mechanics	3
Engineering Analysis	3
Production Cost Estimating	3
Related Technical Electives	6
Statics & Dynamics 1-2	7
Applied Descriptive Geometry	2
Engineering Drawing	2

Technical

Electric Circuits	4
Electronic Instruments	4
Passive Network Analysis	4
Circuits & Devices 1-2	8
Advanced Networks	4
Digital Circuits & Hardware	4
Active Linear Circuits	4
Communications & Minicomputers	4
Computer Technology 1-2	6
Boolean Algebra	3
Technical Design Project	6
Technical Electives	2

Summary

Parameter	Quantity	Normal	Deviation	
General Education	52 QHrs	28.3%	+0.076	
Mathematics	17 QHrs	9.2%	-0.476	
Science	16 QHrs	8.7%	+0.012	
Related Technical	46 QHrs	25.0%	-1.406	
Technical	53 QHrs	28.8%	-1.144	
Total Hours	184 QHrs	122.7	-0.475	Total Deviation
Minimum Laboratory	9 QHrs	4.9%	+0.298	
State of the Art	4 Courses	2.7	-0.044	-3.195
Engineering Graduates		80.0%	+0.502	
Technician Graduates		5.0%	+0.271	
Average Monthly Salary		\$1150.00	-0.214	+0.559

Rank: 52

California State Polytechnic University, Pomona

B.S. in Engineering Technology
Electronics Major

<u>General Education</u>		<u>Related Technical</u>	
American Civilization 1-2	8	Engineering Graphics	2
Technical Writing	4	Manufacturing Processes	4
Principles of Economics	4	Computer Programming for ET	4
Freshman Composition	4	Applied Mechanics	4
Communication or Arts Elective	4	Strength of Materials	4
Humanities Electives	8	Materials Joining	2
Social Science Electives	4	Engineering Econ Anal for ET	4
General Education Electives	6	Engineering Materials	4
		Applied Fluid Mechanics	4
		Graphics Elective	2
		Related Technical Electives	12
<u>Mathematics</u>		<u>Technical</u>	
Trigonometry	4	Electrical Circuits 1-2	8
College Algebra	4	Electronic Devices & Ckts 1-3	12
Technical Calculus 1-2	8	Electronic Circuits	5
Mathematics Elective	3	Intro to Digital Logic	4
		Electrical Circuit Analysis	4
		Linear Amplifier Circuits	4
		Digital Logic Systems	4
		Computer Aided Ckt Analysis	4
		Electronic Test Instruments	4
		Communications Systems	4
		Microprocessors	4
		Advanced Digital Devices	4
<u>Science</u>			
Life Sciences	3		
College Chemistry	4		
College Physics 1-2-3	12		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	42 QHrs	23.1%	+0.919	
Mathematics	19 QHrs	10.4%	+0.003	
Science	19 QHrs	10.4%	+0.562	
Related Technical	46 QHrs	25.3%	-1.450	
Technical	56 QHrs	30.8%	-0.859	
Total Hours	182 QHrs	121.3	-0.590	Total Deviation
Minimum Laboratory	15 QHrs	8.2%	-0.214	
State of the Art	6 Courses	4.0	+0.297	-1.332
Engineering Graduates		90.0%	+0.706	
Technician Graduates		1.0%	+0.403	
Average Monthly Salary		\$1250.00	+0.263	+1.372

Rank: 39

Cogswell College

B.S. in Engineering Technology
Electronics MajorGeneral Education

English Composition 1-2	6
Technical Report Writing	3
American History	3
Speech	3
Industrial Psychology	3
Literature	3
Economics	3
Accounting 1-2	6
Advanced Technical Comm	3
Business Law	3
General Electives	24

Mathematics

College Algebra 1-2	8
Calculus 1-2	8
Differential Equations	3
Statistics	3
Numerical Analysis	3

Science

College Physics 1-2	8
Science Elective	3

Related Technical

Technical Drafting	2
Technical Problems	3
Electrical Drafting	1
Computer Programming	3
Materials & Manufacturing	3
Industrial Safety & Health	3
Technical Creativity	1
Related Technical Elective	3

Technical

DC & AC Circuits 1-2	10
Intro to Semiconductors	3
Networks	5
Semiconductors	5
Electronic Systems	4
Digital Electronics	4
Communications Systems	4
Microwaves & Measurements 1-2	6
Technical Design Projects 1-2	7
Integrated Circuit Appl 1-2	8
Non-Linear Electronics	4
Transmission Lines	4
CMOS Circuits & Applications	4
Technical Electives	6

Summary

Parameter	Quantity	Normal	Deviation	
General Education	60 QHrs	31.3%	-0.410	
Mathematics	25 QHrs	13.0%	+1.041	
Science	11 QHrs	5.7%	-0.959	
Related Technical	22 QHrs	11.5%	+0.561	
Technical	74 QHrs	38.5%	+0.239	
Total Hours	192 QHrs	128.0	-0.042	Total Deviation
Minimum Laboratory	12 QHrs	6.3%	+0.081	
State of the Art	6 Courses	4.0	+0.297	+0.808

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 22

Fairmont State College

B.S. in Engineering Technology
Electronics Major

<u>General Education</u>		<u>Related Technical</u>	
Written English	3	Introduction to Data Process	3
Advanced Written English	3	Occupational Safety	3
Technical Report Writing	3	Personnel Problems	3
English Literature	3	Engineering Analysis	4
American Literature	3	Technology & Society	2
Economics	3	Materials	2
Geography	3	Electronics	2
Psychology	3	Industrial Processes	2
Political Science	3	Mechanics	2
Sociology	3	Energy Conservation	2
History Elective	3	Design Methods	2
Music Appreciation	2	Related Technical Electives	6
Physical Education	1		
Speech	3	<u>Technical</u>	
<u>Mathematics</u>		Electrical Shop Practice	3
Applied Technical Math 1-2	6	Circuit Analysis	2
		Linear Electronics	3
<u>Science</u>		Digital Electronics	3
Science Methodology	2	Industrial Electronics	3
Chemistry 1-2-3	10	AC & DC Machinery	3
Basic Physics	2	Communications Systems	3
Technical Physics 1-2	4	Advanced Linear Electronics	2
		Microcomputer Systems	2
		Current Topics in Electronics	2
		Data Acquisition & Control	2
		Advanced Communication Sys	2
		Technical Electives	6

Summary

Parameter	Quantity	Normal	Deviation	
General Education	39 Hrs	28.7%	+0.011	
Mathematics	6 Hrs	4.4%	-2.392	
Science	22 Hrs	16.2%	+2.438	
Related Technical	33 Hrs	24.3%	-1.304	
Technical	36 Hrs	26.5%	-1.472	
Total Hours	136 Hrs	136.0	+0.613	Total Deviation
Minimum Laboratory	6 Hrs	4.4%	+0.376	
State of the Art	3 Courses	3.0	+0.035	-1.595
Engineering Graduates		50.0%	-0.109	
Technician Graduates		50.0%	-1.215	
Average Monthly Salary		\$1166.00	-0.138	-1.462

Rank: 42

Florida A & M University
 Bachelor of Engineering Technology
 Electronic Engineering Technology Curriculum

General Education

Health	3
Freshman Composition 1-2-3	9
Western History 1492-Date	3
Introduction to Sociology	3
Technical Report Writing	3
Public Speaking	3
Principles of Economics 1-2	6
Principles of Management	5
Industrial Psychology	3
Personnel Management	5
Production Management	5
Organizational Theory & Beh	5
Humanities Elective	3
General Electives	12

Mathematics

Algebra & Trigonometry 1-2	10
Calculus 1	5
Calculus for Elect Tech	6

Science

General Physics 1-2-3	15
General Chemistry 1-2	10

Related Technical

Basic Graphics	3
Computer Methods	2
Electromechanical Technology	3

Technical

Introduction to Measurements	3
Electrical Fundamentals 1-2	8
Electronics 1-2-3	12
Communications Systems 1-2-3	9
Pulse & Switching Circuits	4
Integrated Circuits	3
Rotating Machinery	3
Network Analysis	3
Digital Computer Circuits 1-2	8
Analog & Hybrid Computers	3
Control Systems 1-2	6
Computer Aided Design	3
Instrumentation 1-2	6
Professional Seminar	2
Microwave Systems 1-2	8

Summary

Parameter	Quantity	Normal	Deviation	
General Education	68 QHrs	33.5%	-0.767	
Mathematics	21 QHrs	10.3%	-0.037	
Science	25 QHrs	12.3%	+1.176	
Related Technical	8 QHrs	3.9%	+1.169	
Technical	81 QHrs	39.9%	+0.439	
Total Hours	203 QHrs	135.3	+0.556	Total Deviation
Minimum Laboratory	22 QHrs	10.8%	-0.619	
State of the Art	3 Courses	2.0	-0.227	+2.190
Engineering Graduates		80.0%	+0.502	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1300.00	+0.501	+1.439

Rank: 14

Georgia Southern College

Bachelor of Electrical Engineering Technology

General Education

Technical Report Writing	5
English Composition 1-2	10
Literature	5
Music Appreciation	5
Western Civilization 1-2	10
Political Science	5
Health	5
Psychology	5
Economics	3

Mathematics

Algebra & Trigonometry 1-2	10
Analytic Geometry & Calculus	5

Science

Physics: Mechanics	5
Physics: Heat Light & Sound	5
Physics: Sound & Acoustics	5
Physics: Solid State	5
General Chemistry	5

Related Technical

Technical Drafting	4
Descriptive Geometry	4
Hist & Philosophy of Eng	2
Applied Mechanics	5
Industrial Safety	4
Electrical Drafting	5

Technical

Electrical Technology	5
Electronics	5
Industrial Electronics	5
Communications Systems	5
Circuit Analysis	5
Electrical Circuits	5
Light	3
Electronic Systems	3
Rotating Machinery	3
Electrical Distribution	3
Energy Conservation	3
Logic & Switching Circuits	4
Instrumentation	4
Digital Computers	2
Technical Electives	13

Summary

Parameter	Quantity	Normal	Deviation	
General Education	58 QHrs	30.5%	-0.281	
Mathematics	15 QHrs	7.9%	-0.995	
Science	25 QHrs	13.2%	+1.468	
Related Technical	24 QHrs	12.6%	+0.401	
Technical	68 QHrs	35.8%	-0.146	
Total Hours	190 QHrs	126.7	-0.148	Total Deviation
Minimum Laboratory	6 QHrs	3.2%	+0.563	
State of the Art	3 Courses	2.0	-0.227	+0.635
Engineering Graduates		90.0%	+0.706	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1200.00	+0.024	+1.166

Rank: 24

Indiana University-Purdue University, Fort Wayne

B.S. in Electrical Engineering Technology

General Education

Elementary Composition	3
Fundamentals of Speech	3
Advanced Composition	3
Advanced Technical Speech	3
General Education Electives	18

Mathematics

Mathematics for Technology	3
Calculus for Technology 1-2	6
Advanced Technical Mathematics	3

Science

General Physics	4
Physics	3

Related Technical

Computer Programming Fund	3
Electrical Drafting	2
Topics in Computer Languages	3
Related Technical Electives	15

Technical

Electrical Circuits 1-2	8
Electronics 1-2-3-4	15
Electrical Machines	4
Advanced Electrical Networks	3
Senior Design Project	3
Technical Electives	20

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	24.0%	+0.773	
Mathematics	12 Hrs	9.6%	-0.316	
Science	7 Hrs	5.6%	-0.991	
Related Technical	23 Hrs	18.4%	-0.444	
Technical	53 Hrs	42.4%	+0.765	
Total Hours	125 Hrs	125.0	-0.287	Total Deviation
Minimum Laboratory	9 Hrs	7.2%	-0.059	
State of the Art	3 Courses	3.0	+0.035	-0.494

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 38

Indiana University-Purdue University, Indianapolis

Bachelor of Science in Electrical Technology

General Education

English Composition	3
Fundamentals of Speech	3
Comm Humanities or Soc Science	12
Speech Elective	3
Technical Report Writing	3
General Education Electives	6

Mathematics

Mathematics for Technology	5
Calculus for Technology 1-2	6
Mathematics Elective	3

Science

General Physics 1-2	8
Science Elective	3

Related Technical

Computer Science Elective	3
Electrical Drafting	2
Related Technical Electives	15

Technical

Electrical Circuits 1-2	8
Electronics 1-2-3-4	15
Electrical Machines	4
Electromechanical Control	4
Advanced Electronic Networks	3
Senior Design Project	3
Technical Electives	16

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	23.4%	+0.871	
Mathematics	14 Hrs	10.9%	+0.202	
Science	11 Hrs	8.6%	-0.020	
Related Technical	20 Hrs	15.6%	-0.036	
Technical	53 Hrs	41.4%	+0.653	
Total Hours	128 Hrs	128.0	-0.042	Total Deviation
Minimum Laboratory	10 Hrs	7.8%	-0.152	
State of the Art	3 Courses	3.0	-0.035	+1.440

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 16

Indiana State University, Terre Haute

Bachelor of Science
Electronics Technology Major

<u>General Education</u>		<u>Related Technical</u>	
English 1-2	6	Design Drafting 1-2	4
Writing	3	Fluid Power Technology	3
Speech	2	Machine Tool Practices	3
Physical Education	2	Manufacturing Processes	3
Philosophy Electives	6	Introduction to Indust Tech	3
Arts Electives	5	Intro to Computer Technology	3
Social & Behavioral Sci Elect	11		
General Education Electives	7	<u>Technical</u>	
		Electronics 1-2	4
<u>Mathematics</u>		Solid State Electronics	5
Intermediate Algebra	4	Circuit Analysis 1-2	6
College Algebra & Trigonometry	3	Electronic Amplifiers	5
Calculus	4	Digital Logic	3
		Digital Circuits	3
<u>Science</u>		Industrial Electronics 1-2	10
General Physics 1-2	8	Measurements	3
General Chemistry	4		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	42 Hrs	33.3%	-0.735	
Mathematics	11 Hrs	8.7%	-0.676	
Science	12 Hrs	9.5%	+0.271	
Related Technical	22 Hrs	17.5%	-0.313	
Technical	39 Hrs	31.0%	-0.831	
Total Hours	126 Hrs	126.0	-0.205	Total Deviation
Minimum Laboratory	4 Hrs	3.2%	+0.563	
State of the Art	2 Courses	2.0	-0.227	-2.153
Engineering Graduates		No Response		
Technician Graduates		No Response		
Average Monthly Salary		No Response		

Rank: 45

Kansas State College, Pittsburg
 Bachelor of Science in Technology
 Electronics Technology Major

<u>General Education</u>		<u>Related Technical</u>	
English Composition 1-2	6	Introduction to Computing	3
Basic Speech	3	Machine Tool Processes	3
Economics	3	General Plastics	3
Political Science	3	Process Controls	3
Humanities Electives	6	Technical Electives	13
Technical Report Writing	3		
General Psychology	3	<u>Technical</u>	
Physical Education	3	Applied Electricity	3
		Electronic Devices & Circuits	5
<u>Mathematics</u>		Printed Circuits Laboratory	1
College Algebra	3	Circuit Analysis	4
Plane Trigonometry	3	AC & DC Machines	3
Calculus 1-2	10	Logic Circuits	4
Elementary Statistics	3	Electronic Instruments	3
		Computer Circuits	4
<u>Science</u>		Communications Systems	3
Introductory Physics	5	Electronic Controls	3
		Application Design Problem	2
		Linear Integrated Circuits	3
		Technical Electives	13

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	23.1%	+0.924	
Mathematics	19 Hrs	14.6%	+1.679	
Science	5 Hrs	3.8%	-1.573	
Related Technical	25 Hrs	19.2%	-0.582	
Technical	51 Hrs	39.2%	+0.339	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	5 Hrs	3.8%	+0.469	
State of the Art	2 Courses	2.0	-0.227	+1.151
Engineering Graduates		60.0%	+0.095	
Technician Graduates		10.0%	+0.106	
Average Monthly Salary		\$1050.00	-0.691	-0.490

Rank: 18

Kent State University

Electrical/Electronics Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
English Composition 1-2-3	9	Engineering Drawing 1-2-3	12
Social Science & Humanities	12		
		<u>Technical</u>	
<u>Mathematics</u>		Electronic Fundamentals 1-2	10
Algebra & Trigonometry	5	Electronics 1-2	8
Analytic Geometry & Calculus	10	Digital Computer Fundamentals	4
		Digital Systems	4
<u>Science</u>		Electronic Systems 1-2	8
General Physics 1-2	10	Industrial Controls	4
		Electrical Machines	5

Summary

Parameter	Quantity	Normal	Deviation	
General Education	21 Hrs	20.8%	+1.292	
Mathematics	15 Hrs	14.9%	+1.799	
Science	10 Hrs	9.9%	+0.400	
Related Technical	12 Hrs	11.9%	+0.503	
Technical	43 Hrs	42.6%	+0.824	
Total Hours	101 Hrs	101.0	-2.251	Total Deviation
Minimum Laboratory	6 Hrs	5.9%	+0.143	
State of the Art	2 Courses	2.0	-0.227	+2.483
Engineering Graduates		No Response		
Technician Graduates		No Response		
Average Monthly Salary		No Response		

Rank: 12

Lake Superior State College

B.S. in Electronic Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
Communications	3	Laboratory Methods	2
Physical Education	5	Technical Drawing	3
Freshman English	3	Electromechanical Devices	3
First Aid	1	Statics & Strength of Mat	4
American Government	4	Materials Processing	4
Report Writing & Speech	3	Related Technical Electives	12
Industrial Psychology	3		
Humanities Electives	12	<u>Technical</u>	
Speech	3	Electricity & Magnetism	3
Social Science Electives	12	Electric Circuits	5
General Education Electives	16	Digital Computers	3
		Electronics 1-2-3	15
<u>Mathematics</u>		Advanced Circuits	5
Applied Math 1-2-3-4	16	Digital Electronics 1-2	10
		Industrial Electronics	5
<u>Science</u>		Instrumentation	5
Applied Physics 1-2	8	Electronic Design	5
Science Electives	7	Electrical Machinery 1-2	6
		Technical Electives	9

Summary

Parameter	Quantity	Normal	Deviation	
General Education	65 QHrs	32.5%	-0.605	
Mathematics	16 QHrs	8.0%	-0.995	
Science	15 QHrs	7.5%	-0.376	
Related Technical	28 QHrs	14.0%	+0.197	
Technical	76 QHrs	38.0%	+0.168	
Total Hours	200 QHrs	133.3	+0.392	Total Deviation
Minimum Laboratory	22 QHrs	11.0%	-0.650	
State of the Art	3 Courses	2.0	-0.227	-2.096
Engineering Graduates		40.0%	-0.312	
Technician Graduates		30.0%	-0.555	
Average Monthly Salary		\$1083.00	-0.533	-1.400

Rank: 44

LeTourneau College

B.S. in Electrical Engineering Technology

General Education

Religion Electives	6
English Composition 1-2	6
Old Testament Literature	3
New Testament Literature	3
Physical Activity Elective	4
Introduction to Business	3
General Psychology	3
Humanities Electives	6
Survey of Industrial Management	3
Production Methods	3
English Elective	3

Mathematics

College Algebra & Trigonometry	5
Anal Geometry & Calculus 1-2	8

Science

General Physics 1-2	8
General Chemistry 1-2	8

Related Technical

Engineering Graphics 1-2	4
Statics & Dynamics	3
Materials Science	3
Computer Science	3
Strength of Materials	3
Energy Conservation	3
Thermodynamics	3
Aviation Electronics	3
Related Technical Elective	3

Technical

Basic Electricity	3
Introduction to AC Circuits	2
Electronics 1-2	8
Electronic Servicing	2
Industrial Electronics	3
Communications & FCC Rules	4
Digital Electronics	3
AC & DC Machines	5

Summary

Parameter	Quantity	Normal	Deviation	
General Education	43 Hrs	33.1%	-0.702	
Mathematics	13 Hrs	10.0%	-0.157	
Science	16 Hrs	12.3%	+1.176	
Related Technical	28 Hrs	21.5%	-0.896	
Technical	30 Hrs	23.1%	-1.957	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	5 Hrs	3.6%	+0.500	
State of the Art	1 Course	1.0	-0.489	-2.403

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 47

Louisiana Technical University

B.S. in Electrical Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
English Composition 1-2	6	Electrical Drafting	2
General Electives	29	Mechanical Technology	2
		Technical Drafting	3
<u>Mathematics</u>		Civil Technology	3
		Personal & Occupational Guide	2
College Algebra	3		
College Trigonometry	3	<u>Technical</u>	
Technical Calculus	3		
<u>Science</u>		Basic Electricity	4
		Basic Circuit Theory	4
Physics 1-2-3-4	8	AC Circuits	4
Science Electives	8	Technical Problems	4
		Electronics	4
		Instrumentation	3
		Electrical Applications	4
		Computer Programming	3
		Electrical Power	7
		Computers	4
		Integrated Circuits	4
		Communications Circuits	3
		Control Systems	3
		Seminar	1
		Technical Electives	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	35 Hrs	27.1%	+0.271	
Mathematics	14 Hrs	10.9%	+0.202	
Science	16 Hrs	12.4%	+1.209	
Related Technical	12 Hrs	9.3%	+0.882	
Technical	52 Hrs	40.3%	+0.496	
Total Hours	126 Hrs	126.0	-0.205	Total Deviation
Minimum Laboratory	11 Hrs	8.5%	-0.261	
State of the Art	5 Courses	5.0	+0.558	+3.152
Engineering Graduates		25.0%	-0.617	
Technician Graduates		25.0%	-0.390	
Average Monthly Salary		\$1165.00	-0.142	-1.149

Rank: 10

Memphis State University
B.S. in Engineering Technology
Electronics Technology Major

General Education

English Composition 1-2	6
Physical Education	4
English Electives	6
American History 1-2	6
Technical Report Writing	3
Principles of Economics 1-2	6
Principles of Supervision	3
General Education Electives	9

Mathematics

Algebra & Analytic Geometry	3
Analytic Geometry & Calculus	4

Science

General Chemistry	4
General Physics 1-2	8

Related Technical

Introduction to Technology	3
Graphics 1	3
Machine Production Tech	3
Engr Computer Programming	2
Industrial Materials	3
Computer Technology	3
Related Technical Electives	21

Technical

Electrical Technology 1-3-4	9
Instrumentation	3
Electronic Communications	3
Industrial Electronics	3
Technical Electives	12

Summary

Parameter	Quantity	Normal	Deviation	
General Education	43 Hrs	33.1%	-0.702	
Mathematics	7 Hrs	5.4%	-1.993	
Science	12 Hrs	9.2%	+0.174	
Related Technical	38 Hrs	29.2%	-2.018	
Technical	30 Hrs	23.1%	-1.957	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	10 Hrs	7.7%	-0.137	
State of the Art	9 Courses	9.0	+1.606	-4.902
Engineering Graduates		90.0%	+0.706	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1300.00	+0.501	+1.643

Rank: 56

Metropolitan State College
 B.S. in Engineering Technology
 Electronics Engineering Technology Major

General Education

Freshman Composition 1-2	6
Humanities Electives	9
Social & Behavioral Science	9
Technical Report Writing	3
General Electives	2

Mathematics

College Algebra	4
College Trigonometry	3
Calculus 1-2	8

Science

Physics for Technology 1-2	10
General Chemistry	5

Related Technical

The Technical Profession	1
Materials Manufacturing	3
Electronic Drafting	2
Computer Programming	4

Technical

Direct Current Circuits	6
Alternating Current Circuits	6
Electronics 1-2	12
Adv Electronic Circuits 1-2	8
Digital Circuits 1-2	6
Electrical Measurements	2
Technical Seminar	2
Pulse & Switching Circuits	2
Minicomputer Programming & Opr	4
Minicomputer Applications	4
Operational Amplifier Appl	3
Technical Electives	5

Summary

Parameter	Quantity	Normal	Deviation	
General Education	29 Hrs	22.7%	+0.984	
Mathematics	15 Hrs	11.7%	+0.522	
Science	15 Hrs	11.7%	+0.982	
Related Technical	10 Hrs	7.8%	+1.101	
Technical	59 Hrs	46.1%	+1.323	
Total Hours	128 Hours	128.0	-0.042	Total Deviation
Minimum Laboratory	10 Hrs	7.8%	-0.121	
State of the Art	5 Courses	5.0	+0.558	+5.297
Engineering Graduates		40.0%	-0.312	
Technician Graduates		20.0%	-0.225	
Average Monthly Salary		\$1200.00	+0.024	-0.503

Rank: 3

Milwaukee School of Engineering

B.S. in Electrical Engineering Technology

General Education

Composition	3
Technical Report Writing	3
Speech	3
General Psychology	3
Economics 1-2	6
Engineering Economy	3
Creative Thinking	3
Professional Guidance	1
Industrial Psychology	3
Ethics	3
Business Law	3
General Education Electives	9

Mathematics

College Algebra 1-2	8
Trigonometry	3
Anal Geo & Calculus 1-2-3	11
Engineering Mathematics	4

Science

Chemistry for Technology 1-2	8
Physics for Technology 1-2	8
Solid State Physics	3

Related Technical

Introduction to Technology	3
Engineering Graphics	2
Statics & Strength of Mat	4
Dynamics	4
Thermodynamics	3
Fluid Mechanics	3
Bio-Medical Electronic Appl	8

Technical

Electric Circuit Analysis 1-2	8
Electronic Devices & Circuits	12
Electrical Machines & Control	4
Logic & Switching Circuits	4
Computer Programming	1
Electrical Construction	3
Integrated Circuits	4
Advanced Computer Programming	4
Computer Systems	4
Computer I/O & Storage	4
Computer Practicum	3
Electric Circuits 1-2	7
Advanced Electrical Lab	2
Electromagnetic Fields	3
Feedback Control Systems	3
Applications & Design Elect	12

Summary

Parameter	Quantity	Normal	Deviation	
General Education	43 QHrs	22.3%	+1.048	
Mathematics	26 QHrs	13.5%	+1.258	
Science	19 QHrs	9.8%	-0.371	
Related Technical	27 QHrs	14.0%	+0.176	
Technical	78 QHrs	40.4%	+0.523	
Total Hours	193 QHrs	128.7	-0.002	Total Deviation
Minimum Laboratory	15 QHrs	7.8%	-0.282	
State of the Art	7 Courses	4.7	+0.480	+2.830
Engineering Graduates		80.0%	+0.502	
Technician Graduates		5.0%	+0.271	
Average Monthly Salary		\$1200.00	+0.024	+0.797

Rank: 11

Mississippi State University

Bachelor of Engineering Technology
Electronic Engineering Technology MajorGeneral Education

American Government	3
English Composition	3
Oral Communications	3
Principles of Economics 1-2	6
General Psychology	3
Business Communications	3
Introduction to Sociology	3
Physical Education	3

Mathematics

College Algebra	3
Trigonometry	3
Calculus 1-2	6
Applied Calculus	3
Applied Mathematics	3

Science

General Chemistry 1-2	7
General Physics 1-2-3	9
Intermediate Appl Physics	3

Related Technical

Mechanical Drawing	2
Technical Drawing	2
Descriptive Geometry	3
Mechanics & Materials Proc	3
Energy Conservation	4
Related Technical Electives	6

Technical

Circuits Technology 1-2-3	11
Electronic Techniques 1-2-3	12
Transmission Lines	3
Elect Computer Tech 1-2-3	11
Communications	3
Control Systems	3
Instrumentation Systems	3

Summary

<u>Parameter</u>	Quantity	Normal	Deviation	
General Education	27 Hrs	20.8%	+1.292	
Mathematics	18 Hrs	13.8%	+1.360	
Science	19 Hrs	14.6%	+1.921	
Related Technical	20 Hrs	15.4%	-0.007	
Technical	46 Hrs	35.4%	-0.203	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	9 Hrs	6.9%	-0.012	
State of the Art	3 Courses	3.0	+0.035	+4.508

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 5

Missouri Western State College

Bachelor of Science in Technology
Electronic Engineering Technology MajorGeneral Education

Physical Education Concepts	1
Composition & Rhetoric 1-2	6
Physical Education	3
Speech	3
Social Science Electives	6
Economics	3
Humanities Electives	9
Technical Report Writing	2
General Electives	5

Mathematics

Algebra & Trigonometry	5
Applied Calculus	5

Science

College Physics 1-2	8
Introductory Chemistry	5

Related Technical

Engineering Graphics	3
Intro to Eng & Technology	1
Fortran Programming	3
Refrig & Air Conditioning	3
Related Technical Electives	6

Technical

Electrical Systems	3
Electrical Circuits	3
Introduction to Electronics	3
Electronics	4
Instruments & Measurements	3
Communications Systems	4
Digital Electronics	4
Network Analysis	3
Microwave Systems	3
Advanced Communication Systems	3
Electrical Building Systems	3
Advanced Electronics	4
Rotating Machinery	4
Control Systems	3
Design & Fabrication	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	38 Hrs	29.9%	-0.138	
Mathematics	10 Hrs	7.9%	-0.995	
Science	13 Hrs	10.2%	+0.497	
Related Technical	10 Hrs	7.9%	+1.106	
Technical	50 Hrs	39.4%	+0.367	
Total Hours	127 Hrs	127.0	-0.123	Total Deviation
Minimum Laboratory	11 Hrs	8.7%	-0.292	
State of the Art	1 Course	1.0	-0.489	-0.087
Engineering Graduates		40.0%	-0.312	
Technician Graduates		30.0%	-0.555	
Average Monthly Salary		\$900.00	-1.406	-2.273

Rank: 32

Montana State University

B.S. in Electrical and Electronic Engineering Technology

General Education

Freshman Composition	4
Introduction to Public Speaking	3
Law for Engineering & Arch	4
Engineering Economy	4
Technical Report Writing	4
General Education Electives	8
Humanities and Social Sciences	25

Mathematics

Intermediate Algebra	5
Elements of Mathematics 1-2	10

Science

College Chemistry	4
College Physics	12
Science Electives	6

Related Technical

Introduction to Programming	3
Engineering Graphics 1-2	6
Mechanics	4
Mechanics of Materials	4
Machine Practices	4
Industrial Safety	4
Related Technical Electives	11

Technical

Intro to Electronic Fundament	3
Digital Circuits	4
Electrical Circuits & Fund	13
Electronics 1-2-3	15
Analysis of Linear Systems	3
Minicomputers	4
Industrial Processes Lab	6
Machine & Power Systems	5
Instrumentation	4
Technical Electives	10

Summary

Parameter	Quantity	Normal	Deviation	
General Education	52 QHrs	27.1%	+0.271	
Mathematics	15 QHrs	7.8%	-1.305	
Science	22 QHrs	11.5%	+0.918	
Related Technical	36 QHrs	18.8%	-0.502	
Technical	67 QHrs	34.9%	-0.274	
Total Hours	192 QHrs	128.0	-0.042	Total Deviation
Minimum Laboratory	6 QHrs	3.1%	+0.578	
State of the Art	3 Courses	2.0	-0.227	-0.313
Engineering Graduates		50.0%	-0.109	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1088.00	-0.510	-0.183

Rank: 36

Murray State University
 B.S. in Engineering Technology
 Electrical Engineering Technology Major

General Education

Freshman Orientation	1
English Composition 1-2	6
Basic Speech	3
Technical Report Writing	3
Literature	3
Social Science Electives	12
Engineering Mgt Decisions	3
Communications & Hum Electives	9
General Education Electives	21

Mathematics

Technical Mathematics 1-2-3	11
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Science

General Physics 1-2	8
Intro to College Chemistry	4

Related Technical

Technical Drawing	3
Introduction to Computing	3
Computers & Programming	3
Technology Seminar	1

Technical

Electric Circuits 1-2	6
Electronics 1-2	6
Intro to Digital Electronics	3
Pulse & Switching Circuits	3
Microprocessors	3
Electronic Technology	3
Industrial Instrumentation	3
Electrical Seminar	1
Electrical Machinery	3
Linear Electronics	3
Computer Architecture	3
Advanced Communications Sys	3
Power System Analysis	3
Electrical Machinery Controls	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	61 Hrs	43.6%	-2.431	
Mathematics	11 Hrs	7.9%	-0.995	
Science	12 Hrs	8.6%	-0.021	
Related Technical	10 Hrs	7.1%	+1.203	
Technical	46 Hrs	32.9%	-0.559	
Total Hours	140 Hrs	140.0	+0.940	Total Deviation
Minimum Laboratory	15 Hrs	10.7%	-0.603	
State of the Art	4 Courses	4.0	+0.297	-2.169

Engineering Graduates	No Response
Technician Graduates	No Response
Avg Monthly Salary	No Response (Graduate first class 1978)

Rank: 46

New York Institute of Technology

B.S. in Electrical Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
College Composition 1-2	6	Mechanical Drawing	2
Public Speaking	2	Strength of Materials	4
English Speech Proficiency	1	Engineering Mechanics	3
English Language Electives	6	Applied Thermodynamics	3
Problems in Philosophy	3	Computing Fundamentals	3
Basic Economics	3		
World History 1-2	6	<u>Technical</u>	
Introductory Psychology	3	Intro to Electrical Engineerg	4
General Electives	7	Transmission Lines	4
		Electrical Machinery	4
<u>Mathematics</u>		Networks 1-2	8
Algebra & Trigonometry	3	Electronics 1-2	8
Calculus 1-2-3	12	Control Systems	4
Differential Equations	3	Microelectronics	3
		Logic Design of Dig Comp 1-2	6
<u>Science</u>			
General Physics 1-2-3	12		
General Chemistry 1-2	8		
Physics: Elect & Magnetism	3		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	37 Hrs	27.6%	+0.190	
Mathematics	18 Hrs	13.4%	+1.200	
Science	23 Hrs	17.2%	+2.762	
Related Technical	15 Hrs	11.2%	+0.605	
Technical	41 Hrs	30.6%	-0.888	
Total Hours	134 Hrs	134.0	+0.449	Total Deviation
Minimum Laboratory	5 Hrs	3.7%	+0.485	
State of the Art	3 Courses	3.0	+0.035	+4.838
Engineering Graduates		5.0%	-1.025	
Technician Graduates		15.0%	-0.059	
Average Monthly Salary		\$1150.00	-0.214	-1.298

Rank: 4

Nicholls State University

B.S. in Engineering Technology
Electrical Engineering Technology MajorGeneral Education

English 1-2	6
Personnel Guidance	1
Economics	3
Management	3
Technical Report Writing	3
English Elective	3
American History	3
Business Administration	3
Health & Physical Education	4
General Education Electives	6

Mathematics

Algebra & Trigonometry 1-2	6
Calculus 1-2	6

Science

General Physics 1-2	6
General Chemistry 1-2	8

Related Technical

Engineering Graphics 1-2	5
Statics & Dynamics 1-2	6
Civil Engineering Technology	7
Engineering Problems	3
Strength of Materials	3
Properties of Materials	3
Mechanical Engineering Tech	6
Engineering Technology	2

Technical

Circuits 1	3
Electronics 1	4
Control Systems 1	3
Technical Electives	18

Summary

Parameter	Quantity	Normal	Deviation	
General Education	41 Hrs	31.5%	-0.443	
Mathematics	12 Hrs	9.2%	-0.476	
Science	14 Hrs	10.8%	+0.691	
Related Technical	35 Hrs	26.9%	-1.683	
Technical	28 Hrs	21.5%	-2.185	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	9 Hrs	6.9%	-0.012	
State of the Art	1 Course	1.0	-0.489	-4.475

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 55

Norfolk State College
B.S. in Electronics Technology

General Education

Physical Education	2
Communications Skills 1-2	6
Personal & Community Health	2
Principles of Speech	3
Technical Report Writing	3
General Psychology	3
Principles of Economics	3
General Education Electives	16

Mathematics

Technical Mathematics 1-2-3-4	12
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Science

General Physics 1-2	6
Chemistry 1-2	8

Related Technical

Cooperative Education	6
Drafting 1-2	6
Materials & Processes of Ind	2
Thermodynamics	3
Technical Programming	3
Related Technical Electives	3

Technical

Basic Electricity	4
Basic Electronics	4
Semiconductor Electronics	4
Instruments & Measurements	4
Electronic Communications	4
Computer Circuitry	3
Microwaves	3
Technical Seminar	2
Circuit Analysis	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	38 Hrs	30.2%	-0.232	
Mathematics	12 Hrs	9.5%	-0.356	
Science	14 Hrs	11.1%	+0.778	
Related Technical	23 Hrs	18.3%	-0.430	
Technical	39 Hrs	31.0%	-0.831	
Total Hours	126 Hrs	126.0	-0.205	Total Deviation
Minimum Laboratory	7 Hrs	5.6%	+0.190	
State of the Art	1 Course	1.0	-0.489	-1.565

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 41

Northern Arizona University
 B.S. in Engineering Technology
 Electrical Engineering Technology Major

General Education

Freshman English 1-2	6
Social & Behavioral Sciences	9
Humanities Electives	9
Oral Communication	3
Technical Report Writing	3
Engineering Economy	3
General Electives	6

Related Technical

Introduction to Technology	2
Fortran Programming	3
Engineering Drafting	3
Engineering Analysis	2
Production Technology	3
Engineering Tech Seminar	1
Related Technical Electives	7

Mathematics

Intermediate Algebra	2
College Algebra & Trigonometry	4
Technical Mathematics-3	5

Technical

DC & AC Circuits 1-2	8
Electronic Circuits 1-2	8
Electrical Machines	3
Network Analysis	3
Digital Computers	4
Industrial Control Circuits	4
Pulse & Switching Circuits	4
Communications	4
Microwaves	4
Servomechanisms	4

Science

Chemistry & Physics 1-2	8
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Summary

Parameter	Quantity	Normal	Deviation	
General Education	39 Hrs	31.2%	-0.408	
Mathematics	11 Hrs	8.8%	-0.636	
Science	8 Hrs	6.4%	-0.732	
Related Technical	21 Hrs	16.8%	-0.105	
Technical	46 Hrs	36.8%	-0.003	
Total Hours	125 Hrs	125.0	-0.287	Total Deviation
Minimum Laboratory	9 Hrs	7.2%	-0.060	
State of the Art	1 Course	1.0	-0.489	-2.720

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 51

Northern Illinois University

B.S. in Electrical Engineering Technology

General Education

Rhetoric & Composition	3
Composition & Literature	3
Fundamentals of Speech	3
American Government	3
Humanities Electives	9
Social Science Electives	6
General Electives	27

Mathematics

Elementary Mathematical Anal	5
Technical Math 1-2	6

Science

General Physics 1-2	8
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Related Technical

Industrial Data Processing	3
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Technical

Introduction to Elect Tech	2
Electrical Fundamentals 1-2	8
Electronic Circuit Devices	4
Passive Networks	3
Electronic Circuit Anal 1-2	8
Electrical Machines	3
Electronic Design	3
Active Networks	3
Technical Electives	15

Summary

Parameter	Quantity	Normal	Deviation	
General Education	54 Hrs	43.2%	-2.341	
Mathematics	11 Hrs	8.8%	-0.636	
Science	8 Hrs	6.4%	-0.732	
Related Technical	3 Hrs	2.4%	+1.888	
Technical	49 Hrs	39.2%	+0.335	
Total Hours	125 Hrs	125.0	-2.287	Total Deviation
Minimum Laboratory	5 Hrs	4.0%	+0.438	
State of the Art	1 Course	1.0	-0.489	-1.820
Engineering Graduates		50.0%	-0.109	
Technician Graduates		10.0%	+0.106	
Average Monthly Salary		\$1080.00	-0.548	-0.551

Rank: 43

Northrup University

B.S. in Engineering Technology
Electromechanical MajorGeneral Education

English Composition & Lit 1-2	6
Technical Report Writing	2
Oral Communication	3
American History	4
Humanities Electives	21
Engineering Economics	4

Mathematics

Technical Calculus 1-2-3-4	16
Introduction to Calculus	4

Science

General Physics 1-2-3	12
General Chemistry	4

Related Technical

Introduction to Technology	3
Materials & Processes	4
Statics & Strength of Mat 1-2	9
Prin of Internal Combustion	4
Dynamics	4
Mechanisms of Motion	4
Thermodynamics & Heat Trans	8
Metallurgy	4
Fluid Mechanics	4
Machine Design 1-2	8
Fortran Programming	3
Engineering Drafting	3

Technical

Fund of Electrical Technology	4
Instruments & Measurements	4
Wiring & Distribution	4
Circuit Analysis 1-2	8
Servo Systems & Control	4
Electrical Machines 1-2	8
Power Circuit Analysis	4
Industrial Control Circuits	4
Technical Electives	12

Summary

Parameter	Quantity	Normal	Deviation	
General Education	40 QHrs	21.1%	+1.244	
Mathematics	20 QHrs	10.5%	+0.043	
Science	16 QHrs	8.4%	-0.085	
Related Technical	58 QHrs	30.5%	-2.208	
Technical	56 QHrs	29.5%	-1.044	
Total Hours	190 QHrs	126.7	-0.148	Total Deviation
Minimum Laboratory	14 QHrs	9.3%	-0.385	
State of the Art	0 Courses	0.0	-0.751	-3.334

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 53

Oklahoma State University
 B.S. in Engineering Technology
 Electronics Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Freshman Composition 1-2	6	Personal & Occ Guidance	1
American Government	3	Technical Drawing	3
American History	3	Machine Tool Practices	2
Written Communication	3	Fundamental Computer Prog	3
Industrial Sociology	3	Mechanical Concepts	5
Humanities Electives	4	Industrial Safety Organization	3
General Electives	6	Related Technology Electives	9
 <u>Mathematics</u>		 <u>Technical</u>	
College Algebra	3	Fundamentals of Electricity	4
Trigonometry	3	Electronic Devices & Amps	2
Technical Calculus 1-2	6	Electronic Amplifiers 1-2	8
		Circuit Analysis 1-2	7
<u>Science</u>		Instruments & Measurements 1-2	6
General Physics	4	Pulse & Digital Techniques	4
Applied Chemistry	4	Electronic Digital Systems	3
		Communications Circuits & Sys	4
		Electronic Design	1
		Data Communications	3
		Control Circuits	4
		Microwave Techniques	3
		Topics in Applied Electronics	3
		Computer Techniques	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	28 Hrs	21.7%	+1.147	
Mathematics	12 Hrs	9.3%	-0.436	
Science	8 Hrs	6.2%	-0.797	
Related Technical	26 Hrs	20.2%	-0.706	
Technical	55 Hrs	42.6%	+0.824	
Total Hours	129 Hrs	129.0	+0.040	Total Deviation
Minimum Laboratory	16 Hrs	12.4%	-0.867	
State of the Art	4 Courses	4.0	+0.297	+0.736
Engineering Graduates		25.0%	-0.617	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1300.00	+0.501	+0.320

Rank: 23

Old Dominion University

Bachelor of Science in Engineering Technology
Electrical Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
English Composition	3	Electrical Drafting	3
Technical Report Writing	3	Technical Processes	3
Social Sciences Electives	6	Thermodynamics	3
Humanities Electives	9	Industrial Operations	3
Speech Elective	3	Statics	3
General Education Electives	6	Dynamics	3
		Fortran Programming	3
<u>Mathematics</u>		<u>Technical</u>	
Algebra	3	Electrical Circuits 1-2	6
Trigonometry	3	Electronics 1-2-3	9
Applied Calculus	3	Electrical Lab 1-2-3-4-5	5
Applied Mathematics 1-2	6	Electronic Systems	3
		Digital Circuits	3
		Linear Circuits	3
		Digital Computer Systems	4
		Electrical Machines	4
		Network Analysis	3
		Communications Systems	4
		Automatic Controls	4
		Technical Electives	7
<u>Science</u>			
General Physics 1-2	8		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	23.3%	+0.887	
Mathematics	15 Hrs	11.6%	+0.482	
Science	8 Hrs	6.2%	-0.797	
Related Technical	21 Hrs	16.3%	-0.138	
Technical	55 Hrs	42.6%	+0.824	
Total Hours	129 Hrs	129.0	+0.040	Total Deviation
Minimum Laboratory	9 Hrs	7.0%	-0.028	
State of the Art	2 Courses	2.0	-0.227	+1.053
Engineering Graduates		No Response		
Technician Graduates		No Response		
Average Monthly Salary		No Response		

Rank: 19

Oregon Institute of Technology
 B.S. in Engineering Technology
 Electronics Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Physical Education & Health	7	Q/A & Systems Safety	2
Communications 1-2	6	Related Technical Electives	6
Technical Report Writing	3		
Social Science Electives	6	<u>Technical</u>	
Managerial Accounting 1-2	6	Intro to Electronics Tech	2
Principles of Management	3	Fundamentals of Electronics	6
Administrative Processes	3	Solid State Circuits 1-2	11
Psychology	6	Discrete Logic Circuits	4
Business Elective	2	Electronic Ckt Applications	4
Discussion Processes	3	Integrated Circuits 1-2	10
Humanities Electives	9	Electromagnetic Fields	4
General Education Electives	31	Special Devices & Applications	5
		Digital Circuits Seminar	3
<u>Mathematics</u>		Circuit Analysis	2
Technical Mathematics 1-2-3	12	Feedback Amplifiers	2
Calculus & Analytic Geometry	8	Elect Systems Engineering	3
Mathematics Elective	2	Sequential Circuit Analysis	5
		Adv Technical Communications	3
<u>Science</u>		Adv Linear Circuits Seminar	5
General Physics	6	Industrial Systems	3
General Chemistry	6	Senior Design Project	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	85 QHrs	40.3%	-1.870	
Mathematics	22 QHrs	10.4%	+0.003	
Science	12 QHrs	5.7%	-0.959	
Related Technical	8 QHrs	3.8%	+1.684	
Technical	84 QHrs	39.8%	+0.424	
Total Hours	211 QHrs	140.7	+0.997	Total Deviation
Minimum Laboratory	13 QHrs	6.2%	+0.096	
State of the Art	3 Courses	2.0	-0.227	+0.148
Engineering Graduates		No Response		
Technician Graduates		No Response		
Average Monthly Salary		\$1075.00	-0.572	-0.572

Rank: 29

Purdue University, Calumet

B.S. in Electrical Technology

General Education

English Composition	3
Fundamentals of Speech	3
Technical Report Writing	3
Comm Humanities or Soc Sci	12
Communication Elective	3
General Education Electives	6

Mathematics

Mathematics for Technology	3
Calculus for Technology 1-2	6
Mathematics Elective	3

Science

General Physics	4
Science Electives	6

Related Technical

Electrical Drafting	2
Computer Elective	3
Related Technical Electives	15

Technical

Electrical Circuits 1-2	8
Electronics 1-2-3-4	15
Electrical Machines	4
Advanced Electronic Networks	3
Senior Design Project	3
Technical Electives	20

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	24.0%	+0.773	
Mathematics	12 Hrs	9.6%	-0.316	
Science	10 Hrs	8.0%	-0.215	
Related Technical	20 Hrs	16.0%	-0.094	
Technical	53 Hrs	42.4%	+0.795	
Total Hours	125 Hrs	125.0	-0.287	Total Deviation
Minimum Laboratory	9 Hrs	7.2%	-0.059	
State of the Art	4 Courses	4.0	+0.297	+0.894

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 21

Purdue University, West Lafayette

Bachelor of Science in Electrical Technology

General Education

Technical Report Writing	3
English Composition	3
Fundamentals of Speech	3
Humanities or Social Sciences	9
Speech Electives	6
General Education Electives	6

Mathematics

Mathematics for Technology	5
Calculus for Technology 1-2	6
Mathematics Elective	3

Science

General Physics	4
Science Elective	6

Related Technical

Computer Applications in Tech	3
Electrical Drafting	3
Related Technical Electives	15

Technical

Electrical Circuits 1-2	8
Electronics 1-2-3-4	15
Advanced Electronic Networks	3
Senior Design Project	3
Electrical Machines	4
Technical Electives	20

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	23.4%	+0.871	
Mathematics	14 Hrs	10.9%	+0.202	
Science	10 Hrs	7.8%	-0.279	
Related Technical	21 Hrs	16.4%	-0.153	
Technical	53 Hrs	41.4%	+0.653	
Total Hours	128 Hrs	128.0	-0.042	Total Deviation
Minimum Laboratory	9 Hrs	7.0%	-0.028	
State of the Art	4 Courses	4.0	+0.297	+1.521
Engineering Graduates		60.0%	+0.095	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1330.00	+0.644	+1.175

Rank: 15

Southern Technical Institute

B.S. in Engineering Technology
Electrical Engineering Technology MajorGeneral Education

Composition & Rhetoric	6
Public Speaking	3
American History	5
Technical Report Writing	3
Language & Logic	3
Man & Literature	5
General Psychology	5
Economics	5
Western Civilization	5
General Electives	14

Mathematics

College Algebra	5
Trigonometry	5
Analytic Geometry & Calculus	5
Calculus	5

Science

General Physics 1-2-3	15
General Chemistry	5

Related Technical

Computer Programming	3
Engineering Drawing	2
Related Technical Electives	15

Technical

Circuit Analysis 1-2-3	16
Electromagnetic Devices	3
Intro to Semiconductors	6
Semiconductors & Devices	6
Computer Fundamentals	4
Machine & Symbolic Programming	6
Electronic Applications	4
Pulse & Digital Circuits	6
Electrical Transmission	6
Antennas & Microwaves	6
Computer Programming Appl	4
Electrical Machines	4
Technical Electives	16

Summary

Parameter	Quantity	Normal	Deviation	
General Education	54 QHrs	26.9%	+0.303	
Mathematics	20 QHrs	10.0%	-0.157	
Science	20 QHrs	10.0%	+0.432	
Related Technical	20 QHrs	10.0%	+0.780	
Technical	87 QHrs	43.3%	+0.924	
Total Hours	201 QHrs	134.0	+0.449	Total Deviation
Minimum Laboratory	14 QHrs	7.0%	-0.028	
State of the Art	3 Courses	2.0	-0.227	+2.476

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 13

Southwest Minnesota State University

B.S. in Engineering Technology
Electronic Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
English Rhetoric 1-2	6	BASIC Programming	2
Technical Report Writing	3	Eng Tech Orientation	1
Human Relations	4	Graphics 1-2	6
Physical Education & Health	4	Related Technical Electives	18
General Electives	25		
		<u>Technical</u>	
		Circuits 1-2-3	14
		Diodes & Transistors	2
		Electronic Devices & Circuits	4
		Solid State Devices & Circuits	8
		Pulse & Digital Circuits	4
		Linear Electronic Circuits	4
		Electrical Machines	4
		Digital Systems	4
		Electronic Systems	4
		Computers 1-2	10
<u>Mathematics</u>			
Mathematics for Tech 1-2-3	12		
<u>Science</u>			
Basic Technical Physics 1-2	8		
Science and Man	4		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	42 QHrs	23.3%	+0.887	
Mathematics	12 QHrs	6.7%	-1.474	
Science	12 QHrs	6.7%	-0.635	
Related Technical	27 QHrs	15.0%	+0.051	
Technical	87 QHrs	48.3%	+1.637	
Total Hours	180 QHrs	120.0	-0.696	Total Deviation
Minimum Laboratory	14 QHrs	7.8%	-0.152	
State of the Art	4 Courses	2.7	-0.044	-0.426
Engineering Graduates		60.0%	+0.095	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1200.00	+0.024	+0.555

Rank: 37

Temple University

B.S. in Electrical Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
College Composition	4	Intro to Computer Technology	3
Physical Education	4	Theory of Graphics	3
Business Administration Elect	6	The Engineering Profession	1
Technical Report Writing	4	Statics & Strength of Mat	3
General Electives	23	Dynamics	3
		Materials Technology	3
		Professional Seminar	1
<u>Mathematics</u>			
Calculus 1-2-3	12	<u>Technical</u>	
Differential Equations	4	Electrical Circuits	6
		Integrated Circuits	6
<u>Science</u>		Electronic Circuits	3
Intro to Engineering Physics	8	Electrical Networks	3
		Digital Electronics	3
		Electrical Machines	3
		Electronics Lab 1-2-3-4	12
		Electromagnetic Fields	4
		Minicomputer Systems	3
		Automatic Control Systems	3
		Power Systems	3
		Signal Analysis & Processing	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	41 Hrs	30.6%	-0.297	
Mathematics	16 Hrs	11.9%	+0.602	
Science	8 Hrs	6.0%	-0.862	
Related Technical	17 Hrs	12.7%	+0.387	
Technical	52 Hrs	38.8%	+0.282	
Total Hours	134 Hrs	134.0	+0.449	Total Deviation
Minimum Laboratory	12 Hrs	9.0%	-0.339	
State of the Art	2 Courses	2.0	-0.227	-0.005
Engineering Graduates		50.0%	-0.109	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1300.00	+0.501	+0.828

Rank: 30

Trenton State College
 Bachelor of Science
 Electronics Engineering Technology Major

General Education

English	3
History & Social Science Elec	12
Arts & Humanities Electives	9
Technical Report Writing	3
Speech	3
General Education Electives	17

Mathematics

Elementary Mathematical Anal	3
Differential & Integral Calc	6

Science

General Chemistry	4
General Physics 1-2	8

Related Technical

Graphic Representation	3
Intro to Computer Science	3
Principles of Design & Prod	3
Technical Analysis 1-2	6
Technology Seminar	2

Technical

DC, AC Circuits & Meas 1-2	8
Applied Electronics	3
Creative Design	3
Communications Systems	4
Transistor Electronics	4
Electrical Machinery	4
RF & Microwave Principles	3
Instrumentation & Control	7
Design Synthesis	3
Digital Circuits	4

Summary

Parameter	Quantity	Normal	Deviation	
General Education	47 Hrs	36.7%	-1.286	
Mathematics	9 Hrs	7.0%	-1.354	
Science	12 Hrs	9.4%	+0.238	
Related Technical	17 Hrs	13.3%	+0.299	
Technical	43 Hrs	33.6%	-0.460	
Total Hours	128 Hrs	128.0	-0.042	Total Deviation
Minimum Laboratory	11 Hrs	8.6%	-0.227	
State of the Art	1 Course	1.0	-0.489	-3.371
Engineering Graduatess		70.0%	+0.299	
Technician Graduates		15.0%	-0.059	
Average Monthly Salary		\$1333.00	+0.658	+0.898

Rank: 54

University of Akron

B.S. in Electronic Technology

General Education

English 1-2	7
Human Relations	4
Physical Education	4
Technical Report Writing	3
Basic Economics	5
Western Culture 1-2-3	12
English Composition 1-2	8
Types of Literature	4
Eastern Civilization 1-2	6
Effective Speaking	4
Production Management 1-2	10
General Education Electives	9

Mathematics

Mathematical Analysis 1-2-3-4	15
Technical Mathematics Appl.	4
Introduction to Statistics	3

Science

Basic Physics 1-2	7
Introduction to Chemistry	4

Related Technical

Electronic Drafting	2
Machinery	4
Shop Practices	1
Fortran Programming	3
Economics of Technology	5
Inspection Trips	1
Related Technical Electives	7

Technical

Direct Current Circuits	6
Circuit Theory	4
Electronics 1-2-3	12
Circuit Analysis	4
Network Analysis	3
Industrial Electronics 1-2	8
Data Acquisition Methods	4
Control Systems	4
Digital Systems	4
Communications Systems 1-2	8
Technical Project	1
Digital Computers	4
Analog Computers	4
Electronic Project	2
Servomechanisms	3
Integrated Circuits	2

Summary

Parameter	Quantity	Normal	Deviation	
General Education	74 QHrs	36.3%	-1.221	
Mathematics	22 QHrs	10.8%	+0.163	
Science	9 QHrs	4.4%	-1.379	
Related Technical	23 QHrs	11.3%	+0.591	
Technical	76 QHrs	37.3%	+0.068	
Total Hours	204 QHrs	136.0	+0.613	Total Deviation
Minimum Laboratory	11 QHrs	7.3%	-0.075	
State of the Art	3 Courses	2.0	-0.227	-1.467
Engineering Graduates		40.0%	-0.312	
Technician Graduates		30.0%	-0.555	
Average Monthly Salary		\$1200.00	+0.024	-0.843

Rank: 40

University of Alabama

B.S. in Electrical Engineering Technology

General Education

English Composition 1-2	6
Speech	3
Humanities Electives	6
Technical Report Writing	2
Economics	3
Legal Aspects of Engineering Literature	3
Management & Labor Relations	3
General Education Electives	5

Mathematics

College Algebra	3
Analytic Trigonometry	3
Applied Mathematics 1-2-3	12

Science

Physics 1-2	8
Chemistry	4

Related Technical

Technical Drawing	2
Technical Laboratory	2
Engineering Drawing	2
Engineering Computer Science	3
Statics & Dynamics	4
Thermodynamics & Heat	5
Engineering Materials	3

Technical

Fundamentals of Electricity	2
Electrical Circuits 1-2	8
Electronics 1-2	8
Electromagnetic Fields	2
Electrical Energy Trans	4
Electrical Machinery	4
Communications Systems	2
Technical Design Project	6
Electronic Measurements	3
Technical Electives	6

Summary

Parameter	Quantity	Normal	Deviation	
General Education	34 Hrs	26.2%	+0.417	
Mathematics	18 Hrs	13.8%	+1.360	
Science	12 Hrs	9.2%	+0.174	
Related Technical	21 Hrs	16.2%	-0.123	
Technical	45 Hrs	34.6%	-0.317	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	11 Hrs	8.5%	-0.261	
State of the Art	0 Courses	0.0	-0.751	+0.621
Engineering Graduates		100.0%	+0.909	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1200.00	+0.024	+1.369

Rank: 25

University of Dayton
 Bachelor of Technology
 Electronic Engineering Technology Major

General Education

College Composition	4
Philosophy or Religion Elect	12
Effective Speaking	2
Economics of Industry	3
Organization & Management	3
American Political Ideas	3
Technical Report Writing	2
English Elective	3
Humanities or Social Science	6
General Education Elective	3

Mathematics

Eng Tech Math 1-2-3-4	15
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Science

General Chemistry	4
Technical Physics	3

Related Technology

Introduction to Engineering	3
Statics & Dynamics	3
Related Technology Electives	12

Technical

Intro to Electrical Tech	3
Electronic Measurements 1-2	7
Circuits 1-2	7
Electron Devices 1-2	8
Schematics & Diagrams	1
Pulse Circuit Fundamentals	4
Electronic Communications	4
Digital Computer Fundamentals	3
Technical Project	1
Technical Electives	12

Summary

Parameters	Quantity	Normal	Deviation	
General Education	41 Hrs	31.1%	-0.378	
Mathematics	15 Hrs	11.4%	+0.402	
Science	7 Hrs	5.3%	-1.088	
Related Technical	18 Hrs	13.6%	+0.225	
Technical	51 Hrs	38.6%	+0.253	
Total Hours	132 Hrs	132.0	+0.286	Total Deviation
Minimum Laboratory	7 Hrs	5.3%	+0.236	
State of the Art	4 Courses	4.0	+0.297	+0.233
Engineering Graduates		85.0%	+0.604	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1270.00	+0.358	+1.398

Rank: 27

University of Houston
B.S. in Technology
Electronics Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Business Technology	3	Technical Drafting	4
Physical Education	2	Materials & Processes	3
English 1-2-3	9	Related Technical Electives	13
American History 1-2	6		
American Government 1-2	6	<u>Technical</u>	
General Electives	21	Electrical Circuits 1-2	7
		Computer Organization	4
<u>Mathematics</u>		Semiconductor Circuits 1-2	6
Technical Mathematics 1-2	6	Electronic Switching Circuits	4
Advanced Technical Math 1-2	6	Microprocessors	4
		Advanced Electrical Circuits	4
<u>Science</u>		Computer Techniques 1-2-3	12
General Physics 1-2	8		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	47 Hrs	36.2%	-1.205	
Mathematics	12 Hrs	9.2%	-0.476	
Science	8 Hrs	6.2%	-0.797	
Related Technical	20 Hrs	15.4%	-0.007	
Technical	43 Hrs	33.1%	-0.531	
Total Hours	130 Hrs	130.0	+0.122	Total Deviation
Minimum Laboratory	12 Hrs	9.2%	-0.730	
State of the Art	6 Courses	6.0	+0.820	-2.444
Engineering Graduates		No Response		
Technician Graduates		No Response		
Average Monthly Salary		\$1200.00	+0.024	+0.024

Rank: 48

University of Pittsburg, Johnstown

B.S. in Electrical Engineering Technology

General Education

Communications 1-2-3	9
American Government	3
Physical Education	2
Industrial Psychology	3
Engineering Economics	3
Humanities or Social Science	9
Industrial Org & Management	3

Related Technical

Engineering Drawing	7
Technical Seminar	4
Computer Systems & Programming	3
Elementary Surveying	3
Statics	3
Dynamics	3
Heat Transfer	3

Mathematics

Engineering Calculations	2
Algebra & Trigonometry	4
Calculus 1-2	8
Probability & Statistics	4

Technical

Circuits 1-2	8
Electronics 1-2	8
Advanced Programming	3
Seminar	4
Electrical Machines	4
Digital Systems	4
Power Systems	4
Control Methods	4
Analog Computation	3
Senior Project	3
Technical Electives	8

Science

Mechanics	5
Electricity & Magnetism	4
General Chemistry	4

Summary

Parameter	Quantity	Normal	Deviation	
General Education	32 Hrs	22.5%	+1.107	
Mathematics	18 Hrs	12.7%	+0.921	
Science	13 Hrs	9.2%	+0.174	
Related Technical	26 Hrs	18.3%	-0.430	
Technical	53 Hrs	37.3%	+0.068	
Total Hours	140 Hrs	140.0	+1.104	Total Deviation
Minimum Laboratory	8 Hrs	5.6%	+0.190	
State of the Art	4 Courses	4.0	+0.297	+3.341
Engineering Graduates		95.0%	+0.807	
Technician Graduates		0.0%	+0.436	
Average Monthly Salary		\$1150.00	-0.214	+1.029

Rank: 6

University of Maine, Orono

B.S. in Engineering Technology
Electrical Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Written Expressions	3	Technical Drawing 1-2	4
Literature Applications	3	Machine Shop	3
Speech	3	Engineering Materials	3
Engineering Management	3	Thermal Science	3
General Education Electives	18	Statics	3
		Technical Computations	2
<u>Mathematics</u>		<u>Technical</u>	
Technical Mathematics 1-2-3	9	Basic Electricity	3
		Basic Circuits	5
		Electronics 1-2-3	13
		Electrical Machines	5
		Applied Electronics	4
		Power Distribution	4
		Instrumentation & Control	4
		Technical Project	2
		Linear Systems 1-2	6
		Digital Communications Sys	3
		Technical Electives	9
<u>Science</u>			
Basic Physics	5		
General Chemistry	4		

Summary

Parameter	Quantity	Normal	Deviation	
General Education	30 Hrs	22.9%	+0.952	
Mathematics	9 Hrs	6.9%	-1.394	
Science	9 Hrs	6.9%	-0.571	
Related Technical	18 Hrs	13.7%	+0.241	
Technical	65 Hrs	49.6%	+1.822	
Total Hours	131 Hrs	131.0	+0.204	Total Deviation
Minimum Laboratory	14 Hrs	10.7%	-0.603	
State of the Art	1 Course	1.0	-0.489	+0.162

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 28

University of South Dakota, Springfield

B.S. in Technology
Electronics Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Communications Electives	6	Sketching & Schematics	2
Soc & Behavioral Science Elect	9	Related Technical Electives	7
General Electives	15		
Health Education	4	<u>Technical</u>	
Humanities Electives	6	Electronic Systems	2
		Direct Current Concepts	4
<u>Mathematics</u>		Alternating Current Concepts	4
Calculus 1-2	8	Seminar	1
Mathematics Electives	8	Electronic Circuits 1-2	8
		Communications Circuits	4
<u>Science</u>		Resonating Systems	3
Physical & Nat Science Elect	16	F.C.C. Rules & Regulations	4
		Technical Electives	16

Summary

Parameter	Quantity	Normal	Deviation	
General Education	39 Hrs	30.5%	-0.281	
Mathematics	16 Hrs	12.5%	+0.841	
Science	16 Hrs	12.5%	+1.241	
Related Technical	9 Hrs	7.0%	+1.217	
Technical	48 Hrs	37.5%	+0.096	
Total Hours	128 Hrs	128.0	-0.042	Total Deviation
Minimum Laboratory	7 Hrs	5.5%	+0.205	
State of the Art	3 Courses	3.0	+0.035	+3.312
Engineering Graduates		20.0%	-0.719	
Technician Graduates		20.0%	-0.225	
Average Monthly Salary		\$1130.00	-0.309	-1.253

Rank: 7

University of Southern Colorado

B.S. in Electronics Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
Basic Communications	10	Computer Programming	2
Physical Education	2	Manufacturing Techniques	2
General Education Electives	20	Industrial Engineering	6
		Related Technical Electives	5
<u>Mathematics</u>		<u>Technical</u>	
Mathematics for Eng Tech 1-3	12	DC & AC Circuit Analysis 1-2	8
Mathematics Elective	3	Electronics 1-2	10
<u>Science</u>		Linear Integrated Circuits	3
Principles of Physics 1-2	8	Introduction to Digital Syst	4
		Intro to Communications Syst	2
		Circuits & Elect Labs 1-2	5
		Transient Circuit Analysis	4
		Electronic Circuits 1-2	7
		Intro to Control Theory	4
		Computers 1-2	6
		Communications Systems	3
		Technical Elective	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	32 Hrs	24.1%	+0.757	
Mathematics	15 Hrs	11.3%	+0.362	
Science	8 Hrs	6.0%	-0.862	
Related Technical	15 Hrs	11.3%	+0.591	
Technical	63 Hrs	47.4%	+1.508	
Total Hours	133 Hrs	133.0	+0.367	Total Deviation
Minimum Laboratory	9 Hrs	6.8%	+0.003	
State of the Art	5 Courses	5.0	+0.558	+3.284
Engineering Graduates		50.0%	-0.109	
Technician Graduates		50.0%	-1.215	
Average Monthly Salary		\$1208.00	+0.063	-1.261

Rank: 8

University of Toledo

Bachelor of Engineering Technology
Electronics Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Social Sciences 1-2-3	12	Technical Drawing	3
Effective Reading 1-2-3	11	Electrical Drafting	3
Communications 1-2-3	11		
Humanities Electives	8	<u>Technical</u>	
General Education Electives	29	Electrical Fundamentals 1-2	9
		AC Circuit Analysis	5
<u>Mathematics</u>		Electronic Principles 1-2	9
Technical Math 1-2-3-4-5	19	Electronic Measurements	4
Statistics & Probability	4	Logic Circuits	3
		Electrical Machines	3
<u>Science</u>		Linear Circuits	4
Technical Physics 1-2	8	Electronic Communications	4
		Electronic Prototypes	3
		Solid State Switching	4
		Transient Analysis	4
		Integrated Design	4
		Electromagnetic Design	5
		Advanced Network Analysis	4
		Advanced Electronic Circuits	5
		Technical Project	5
		Automatic Controls	5
		Technical Electives	13

Summary

Parameter	Quantity	Normal	Deviation	
General Education	71 QHrs	35.3%	-1.059	
Mathematics	23 QHrs	11.4%	+0.402	
Science	8 QHrs	4.0%	-1.509	
Related Technical	6 QHrs	3.0%	+1.800	
Technical	93 QHrs	46.3%	+1.352	
Total Hours	201 QHrs	134.0	+0.449	Total Deviation
Minimum Laboratory	22 QHrs	14.7	-1.225	
State of the Art	3 Courses	2.0	-0.227	-0.017
Engineering Graduates		No Response		
Technician Graduates		No Response		
Average Monthly Salary		No Response		

Rank: 31

University of Wisconsin, Parkside

B.S. in Engineering Technology
Electrical Technology MajorGeneral Education

Composition & Reading	3
Organizational Behavior	3
Technical Presentations	3
General Education Electives	27

Mathematics

College Algebra	3
Trigonometry	2
Calculus 1-2	10

Science

General Physics 1-2	10
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Related Technical

Introduction to Computers	3
Engineering Drawing	2
Manufacturing Processes	3
Strength & Properties of Mat	2
Applied Mechanics	4
Cost Estimating & Engineering	3

Technical

Electrical Circuits 1-2	6
Applied Linear Systems	3
Applied Electronics 1-2	6
Electrical Machinery	6
Instrumentation	3
Industrial Controls	3
Senior Project	4
Minicomputer Applications	3
Industrial Electronics	3
Process Control Computers	3
Computer Electronics	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	36 Hrs	29.8%	-0.167	
Mathematics	15 Hrs	12.4%	+0.801	
Science	10 Hrs	8.3%	-0.118	
Related Technical	17 Hrs	14.0%	+0.197	
Technical	43 Hrs	35.5%	-0.189	
Total Hours	121 Hrs	121.0	-0.614	Total Deviation
Minimum Laboratory	5 Hrs	4.1%	+0.423	
State of the Art	3 Courses	3.0	+0.035	+0.368

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 26

Wayne State University

Bachelor of Engineering Technology
Electrical/Electronic MajorGeneral Education

English Electives	8
Political Science	4
Introductory Psychology	4
Effective Speech	4
General Education Electives	12

Mathematics

Elementary Functions	5
Applied Statistics	4
Applied Calculus 1-2	8

Science

General Chemistry	4
General Physics 1-2	8
Science Elective	3

Related Technical

Engineering Graphics	3
The Technical Professions	3
Statics & Dynamics 1-2	7
Engineering Econ Analysis	4
Intro to Digital Computers	4
Thermodynamics	4
Heat Transfer	3
Related Technical Electives	26

Technical

Resistive Networks	4
AC Network Analysis	4
Instrumentation	2
Electronic Circuits	4
Technical Laboratory	2
Electromagnetic Design	4
Design of Electrical Elements	4
Technical Electives	30

Summary

Parameter	Quantity	Normal	Deviation	
General Education	36 QHrs	20.0%	+1.442	
Mathematics	17 QHrs	9.4%	-0.396	
Science	15 QHrs	8.3%	-0.188	
Related Technical	54 QHrs	30.0%	-2.135	
Technical	56 QHrs	31.1%	-0.816	
Total Hours	180 QHrs	120.0	-0.696	Total Deviation
Minimum Laboratory	7 QHrs	3.9%	+0.454	
State of the Art	2 Courses	1.3	-1.410	-2.695

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response

Rank: 49

Western Kentucky University

B.S. in Electrical Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
English Composition 1-2-3	9	Engineering Drafting	3
Speech	3	Computer Science	3
Office Administration	3	Intro to Engineering Tech	1
Business Elective	3	Statics	3
General Education Electives	31		
		<u>Technical</u>	
<u>Mathematics</u>		Electricity 1-2	7
College Algebra & Trigonometry	5	Circuits 1-2	7
Elements of Calculus 1-2	9	Circuit Design	3
		Digital Circuits	4
<u>Science</u>		Communications Systems	4
University Physics 1-2	10	Networks	4
		Modern Electronics	4
		AC & DC Machines	4
		Senior Project	3
		Technical Electives	6

Summary

Parameter	Quantity	Normal	Deviation	
General Education	49 Hrs	36.8%	-1.303	
Mathematics	14 Hrs	10.5%	+0.043	
Science	10 Hrs	7.5%	-0.376	
Related Technical	10 Hrs	7.5%	+1.114	
Technical	50 Hrs	37.6%	+0.111	
Total Hours	133 Hrs	133.0	+0.367	Total Deviation
Minimum Laboratory	8 Hrs	6.0%	+0.127	
State of the Art	2 Courses	2.0	-0.227	-0.114
Engineering Graduates		80.0%	+0.502	
Technician Graduates		15.0%	-0.059	
Average Monthly Salary		\$1066.66	-0.611	-0.168

Rank: 34

Weber State College

B.S. in Electrical Engineering Technology

<u>General Education</u>		<u>Related Technical</u>	
Principles of Supervision	3	Intro to Appl Mechanics	4
English Composition 1-3	9	Applied Mechanics	4
Health Education	2	Materials & Processes	5
Physical Education	3	Intro to Data Processing	3
American History & Government	9	Computer Aided Graphics	3
Humanities Electives	9		
General Electives	8	<u>Technical</u>	
		Circuit Analysis	4
<u>Mathematics</u>		Linear Circuits	5
Applied Mathematics	5	Semiconductor Devices	5
Algebra	5	Communications 1-2	8
Trigonometry	5	Principles of Logic Design	4
Calculus 1-2	10	Active Networks	5
Statistics	4	Instrumentation	4
		Digital Systems	4
<u>Science</u>		Analog and Digital Systems	4
Physics 1-3	12	Senior Problems	2
General Chemistry	5	Digital Signal Processing	5
General Zoology	5	Fundamentals of Auto Control	5
Natural History	4	Intro to Digital Systems	5
		Electronic Circuit Fund	4
		Introduction to Electronics	5
		Senior Design Project	6
		Intro to Microprocessors	3

Summary

Parameter	Quantity	Normal	Deviation	
General Education	43 QHrs	21.7%	+1.147	
Mathematics	29 QHrs	14.6%	+1.679	
Science	26 QHrs	13.1%	+1.435	
Related Technical	22 QHrs	11.1%	+0.620	
Technical	78 QHrs	39.4%	+0.367	
Total Hours	198 QHrs	132.0	+0.286	Total Deviation
Minimum Laboratory	9 QHrs	4.5%	+0.361	
State of the Art	6 Courses	4.0	+0.297	+6.192
Engineering Graduates		20.0%	-0.719	
Technician Graduates		10.0%	+0.106	
Average Monthly Salary		\$1200.00	+0.024	-0.589

Rank: 1

Wichita State University

Bachelor of Engineering Technology
Electrical Engineering Technology MajorGeneral Education

Industrial Supervision	3
College English 1-2	6
Basic Public Speaking	3
Technical Report Writing	3
Social & Behavioral Sci Elec	6
Social Sci or Humanities Elec	7
Humanities & Fine Arts Elective	3
General Education Electives	4

Mathematics

Technical Algebra & Trig	5
Technical Calculus 1-2	6

Science

General College Physics 1-2	10
General Chemistry	5

Related Technical

Intro to Engineering Concepts	2
Engineering Graphics	2
Intro to Digital Computing	3
Electrical Drafting	2
Statics & Dynamics	4
Thermodynamics & Heat	4
Related Technical Electives	6

Technical

Intro to Electricity	4
Electrical Circuit Analysis	4
Linear Electronic Circuits	4
Electrical Power & Machines	4
Digital Electronic Circuits	4
Advanced Electrical Networks	3
Senior Design Project	3
Technical Electives	14

Summary

Parameter	Quantity	Normal	Deviation	
General Education	35 Hrs	28.2%	+0.082	
Mathematics	11 Hrs	8.9%	-0.596	
Science	15 Hrs	12.1%	+1.112	
Related Technical	23 Hrs	18.5%	-0.229	
Technical	40 Hrs	32.3%	-0.332	
Total Hours	124 Hrs	124.0	-0.369	Total Deviation
Minimum Laboratory	4 Hrs	3.2%	+0.561	
State of the Art	1 Course	1.0	-0.489	-0.260

Engineering Graduates	No Response
Technician Graduates	No Response
Average Monthly Salary	No Response (First graduates May, 1979)

Rank: 35

Youngstown State University
 B.S. in Applied Science
 Electrical Engineering Technology Major

<u>General Education</u>		<u>Related Technical</u>	
Basic Composition 1-2	8	Drawing Fundamentals	3
Health & Physical Education	6	Elements of Eng Technology	4
Social Science Electives	13	Scientific Programming 1-2	8
Business & Professional Speech	3	Properties of Materials	4
Introduction to Economics	3	Manufacturing Technology	4
Humanities Electives	8	Building Systems	4
Economics & Social Statistics	4	Physical Measurements	4
Business Law	4		
Production Management	4	<u>Technical</u>	
Fundamentals of Management	4		
General Education Electives	12	Circuit Theory 1-2-3	12
		Measurement	4
<u>Mathematics</u>		Electronics 1-2-3	12
Algebra	5	AC & DC Electrical Mach 1-2	8
Trigonometry	5	Industrial Electronics	3
Applied Mathematics 1-2-3	13	Industrial Controls	4
		Pulse Circuit Design	4
<u>Science</u>		Logic Systems Design	4
Fund of Physics 1-2-3	8	Networks	4
		Electrical Power Systems	4
		Electronic Systems Design	4

Summary

Parameter	Quantity	Normal	Deviation	
General Education	69 QHrs	35.6%	-1.108	
Mathematics	23 QHrs	11.9%	+0.602	
Science	8 QHrs	4.1%	-1.476	
Related Technical	31 QHrs	16.0%	-0.094	
Technical	63 QHrs	32.5%	-0.617	
Total Hours	194 QHrs	129.3	+0.040	Total Deviation
Minimum Laboratory	9 QHrs	4.6%	+0.345	
State of the Art	2 Courses	1.3	-0.410	-2.718
Engineering Graduates		30.0%	-0.516	
Technician Graduates		10.0%	+0.106	
Average Monthly Salary		\$1290.00	+0.462	+0.052

Rank: 50

APPENDIX A

COVER LETTER

Dear Sir:

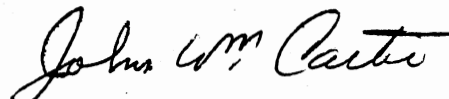
In the past few years there has been a significant increase in the number of four-year degree programs in electronics technology offered throughout the country. There appears to be a great diversity of curriculum content and purpose in these programs. In order to document and summarize the curriculum offerings in electronics technology, I am conducting a survey of these programs with the goal of including each program offered within the United States. In order to reach this goal, I will need a few moments of your time to complete the attached questionnaire.

In order to include your program in the study I must have this information in my possession by May 31, 1978, so your prompt action would be greatly appreciated.

Though the questionnaire is short and structured, please feel free to add any comments. Also, please limit graduate employment data to those students who have graduated in the 1976-1977 academic year. It is not necessary to include 1978 data in your response if that data is not readily available.

I would like to thank you very much for your time and action on this request. Please return the questionnaire in the enclosed, self-addressed, stamped envelope.

Sincerely,



John W. Carter, Graduate Student
Oklahoma State University

I hope that you will take the time to fill out Mr. Carter's questionnaire. I am looking forward to seeing the results of this study as I believe it will have real relevance for all Electronics Technology departments.

Sincerely,



Perry R. McNeill, Head
Electronics Engineering Technology

VITA²

John William Carter

Candidate for the Degree of

Master of Science

Thesis: DEGREE PROGRAMS LEADING TO THE BACHELOR OF TECHNOLOGY
IN ELECTRONICS OFFERED BY INSTITUTIONS WITHIN THE
UNITED STATES

Major Field: Technical Education

Bibliographical:

Personal Data: Born in Binghamton, New York, April 7, 1951, son of
Mr. and Mrs. William Carter.

Education: Graduated from Binghamton North High School, Binghamton, New
York, in 1969 with New York State Regents Diploma; received
the Associate of Applied Science degree in Electronics Engi-
neering Technology in 1971 from the State University of New
York; received the Bachelor of Science in Engineering Techno-
logy degree with a major in Electronics from Oklahoma State
University in 1977; completed requirements for Master of
Science degree from Oklahoma State University in July, 1978.

Professional Experience: Telecommunications Systems Quality Control
Supervisor, 1972-1975 for the United States Air Force Communi-
cations Service. Undergraduate Teaching Assistant, Research
Assistant and Graduate Teaching Assistant, Oklahoma State
University School of Technology, 1976-1978.

Professional Organizations: American Society for Engineering Education,
Ancient and Beneficent Order of the Red, Red Rose.