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AUTHOR Marmaras, Judy; Neri, Pat
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ABSTRACT

The Tech-Prep Associate Degree Program (TPAD) at the Community College of Rhode Island (CCRI) in Warwick, is a high school/community college partnership providing high school students with an alternative program of study focused on goal setting, basic academic skills development, and the skills needed to pursue a career in a technical, business or allied health field. Students are assessed in the 10th grade and begin the program in grade 11. Upon completion, students are guaranteed acceptance into the technical programs at CCRI. The first sections of this program guide to the TPAD provide a directory of personnel and over 30 participating institutions, a timeline of activities, and information on student selection. Next, the curriculum guide/course of study at the secondary level and technical course outlines for the postsecondary level are presented, along with descriptions of options, qualifications and salaries for seven career programs: chemical technology, electronics, engineering, electronic engineering, instrumentation technology, machine design, and machine processes. The final section describes the Business/Office Administration program, including information on student selection, as well as postsecondary courses of study for the business administration, accounting, law enforcement, office administration, legal administrative assistant, and medical administrative assistant programs. Placement test samples, student forms and applications, the TPAD articulation agreement, and a list of advisory board members are appended. (MAB)

2 Program +2 Guide

Tech-Prep Associate Degree Program
Business Administration Associate Degree Program
Office Administration Associate Degree Program
Allied Health Associate Degree Program

Community College of Rhode Island
400 East Avenue
Warwick, Rhode Island 02886

Judy Marmaras
Project Director
825-2143

A Community College High School Partnership

TECH PREP/ASSOCIATE DEGREE PROGRAM GUIDE

Tech Prep Associate Degree Program
Business Administration Associate Degree Program
Office Administration Associate Degree Program
Allied Health Associate Degree Program

Community College of Rhode Island
400 East Avenue
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Judy Marmaras
Project Director
Pat Neri
Project Coordinator
401-825-2143

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Office of Higher Education

Rhode Island Department of Education:
Division of Vocational and Adult Education

United States Department of Education

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Bristol High School

Burrillville High School

Central High School

Central Falls High School

Chariho Regional High School

Chariho Vocational Technical Facility

Coventry High School

Cranston High School East

Cranston High School West

Cranston Vocational Technical Facility

Cumberland High School

East Greenwich High School

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North Kingstown High School

North Providence High School

Pilgrim High School

Tiverton High School

Toll Gate High School

Warren High School

Warwick Veterans Memorial High School

Warwick Vocational Technical Facility

Westerly High School

West Warwick High School

Woonsocket High School

Woonsocket Vocational Technical Facility

Davies Vocational Technical Facility

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TECH PREP/ ASSOCIATE DEGREE ACTIVITY TIMELINE

Activity	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Orientations at the High School										
Orientations at CCRI										
Senior Day- Luncheon & Placement Testing										
Career Day										
Shadowing										
Early Registration										

INTRODUCTION

The Tech Prep/Associate Degree Program (TPAD), formerly referred to as 2 + 2, is a Community College/Secondary School partnership that has generated much support and enthusiasm in Rhode Island and is well established around the state. Tech prep in Rhode Island is designed to offer high school students an alternative program of study that is goal oriented, focuses on basic academic skill development in math, science and communications, and provides them with the skills needed to pursue a career in a technical, business or allied health field. The TPAD Program is aimed at the vast majority of students who are enrolled in unfocused general education programs - programs of study that prepare them for neither work nor college. The tech prep initiative responds to economic changes taking place in the United States and around the world. The globalization of commerce and industry and the introduction of the personal computer in 1975 have created the need for new work environments and a better educated technically skilled workforce. A recent study, "America's Choice: High Skills or Low Wages" examined the changes in the world of work and proposed a new work environment that the US must adopt in order to remain competitive in a world class economy. The study reported that

- ... the economic future of our country depends on creating high performance work organizations and a highly competitive workforce,
- ... work environments will be problem oriented, flexible and organized in teams, and
- ... traditional mass production work environments will no longer be effective.

The study also reported that more than 70% of the jobs in America by the year 2000 will not require a 4-year baccalaureate degree but most will require some education and training beyond high school. The educational performance of our non-college bound students, those who will be the backbone of our economy, will determine the economic future of the United States - high skills, high wages or low skills, low wages.

However, as demands for a more educated, highly skilled workforce increase, the dropout rate in this country remains high. Statistics show that of the 44 million elementary and secondary school students in the country today, 12 million will not finish high school, and two-thirds of the dropouts will come from the unfocused general education population. Over 43 percent of the high school students in the United States today are enrolled in general education programs, nearly four times greater than the

number enrolled in 1969.

In 1987, the Community College of Rhode Island in a cooperative effort with the Rhode Island Department of Elementary and Secondary Education: Division of Vocational and Adult Education established a TPAD Program with several secondary schools in the state to address the problem of increasing numbers of students enrolled in unfocused general education programs and to contribute to our country's labor needs. Based on the book The Neglected Majority written by Dale Parnell, former President of the American Association for Community and Junior Colleges, the TPAD Program provides students with a clearly defined course of study that begins in the eleventh grade and includes science (Principles of Technology), math and communications - all taught in an applied setting. These courses provide a foundation of basic academic skills so that students will be better prepared to pursue a postsecondary technical training program. Because it is goal oriented, the tech prep curriculum has the potential to give the less motivated student an incentive to finish high school and eventually complete the requirements for an associate degree. The TPAD Program provides a realistic and attractive educational continuum that not only contributes to our country's labor needs but also addresses the dropout problem among our high school youth.

This year, a national movement is underway in the United States to implement TPAD programs in every state in order to meet the needs of a large number of undirected students as well as to meet the country's changing employment needs. Rhode Island is one of the few states to have a well-established, successful TPAD Program and received an award from the American Association of Community and Junior Colleges in 1990 as one of 3 model programs in the country.

The Community College of Rhode Island along with local high schools, the Rhode Island Department of Elementary & Secondary Education, and the Office of Higher Education have all demonstrated commitment to and support of this model program. Participating high schools have implemented new curricula in science, math and communications that combine a "hands-on" practical approach to learning with critical academic skills. Funding provided by the Office of Higher Education and the Rhode Island Department of Elementary and Secondary Education as well as continued internal support and commitment from the administration and faculty at CCRI have contributed to the continuation and growth of the TPAD Program.

As a result of the cooperative efforts between the Community College and participating secondary schools, the Tech Prep Program will begin its sixth year in September, 1992. Thirty comprehensive

high schools and vocational/technical facilities and more than 2000 students will participate in the program at the secondary and postsecondary level.

TECH PREP ASSOCIATE DEGREE PROGRAM

COMMUNITY COLLEGE OF
RHODE ISLAND

11/12

12

TECH PREP/ASSOCIATE DEGREE PROGRAM

ARTICULATION IN THE COMPREHENSIVE SCHOOL

The Tech Prep/Associate Degree Program is a high school/community college partnership that provides an alternative program of study for students who are enrolled in general education or vocational programs.

The program begins in grade 11 at the secondary level where students enroll in a focused curriculum in science (Principles of Technology), math and English - all taught in an applied setting. These courses provide students with the academic skills they will need to pursue a postsecondary technical training program and subsequently a career in a technical field.

The TPAD Program is an educational plan that

... offers an alternative to the traditional college prep program
... offers students a solid academic foundation based on concrete, real-life applications
... coordinates the efforts of secondary and postsecondary schools to achieve maximum results in minimum time
... effectively addresses key differences in student needs, backgrounds, and learning styles and
... provides students with lifelong learning competencies.

Because it is goal-oriented, the tech prep curriculum has the potential for giving the less motivated student an incentive to finish high school and eventually complete the requirements for an associate degree.

STUDENT SELECTION

Students are targeted for the TPAD Program in grade 10 and begin the program in grade 11 at the secondary level. The kinds of students likely to enroll in the TPAD Program are those students who are in an unfocused general program of study and who lack career and educational goals as well as those students who are

enrolled in vocational technical programs that are likely to lead to some postsecondary education and training.

The program is designed for the average student in the middle two quartiles who falls between a 4 and 7 stanine.* The curriculum materials are written at a ninth grade reading level.

The recruitment process includes

... information letters to students and parents
... orientation presentations and meetings
... student interviews and counseling sessions
... selection meetings
... parent orientations
... distribution of promotional materials (fliers, brochures)

Students are targeted and selected by the guidance counselors with input from the classroom teachers. Students selected for the TPAD Program are those who ultimately can meet the academic requirements of an associate degree.

To assist with student recruitment, tech prep staff at the Community College of Rhode Island are available during the school year to conduct student and parent orientations at the high schools.

Once selected, students will receive an informational packet on tech prep and will be invited to visit the Community College for an introduction to the program.

TECH PREP STUDENT PROFILE

Evaluate grade 10 students at midyear by using the following criteria:

1.	REPORT CARD	-	College prep students who are not succeeding and strong non-college prep students are candidates.
2.	PORTFOLIO	-	Assess past performance for strengths and weaknesses.
3.	CAREER INTEREST ASSESSMENTS	-	Review results to determine interests.
4.	STANDARDIZED TESTS	-	MAT Scores in the 40 percentile to 60 percentile range.

Consideration should be given to all the above areas before guiding a student in/out of the 2 + 2 Program.

COURSE SELECTION

Students enrolling in the TPAD Program take the Principles of Technology (Applied Physics), English with an Applied Communications component and Technical Math I and II. Selection of math courses may vary according to a student's math skills and career goals, and Technical Math may be offered in grades 10 and 11 rather than 11 and 12. Technical Math I and II provide students with the minimal math requirements needed for most of the technical programs at CCRI. Some of the technical programs at CCRI, however, require advanced math skills for acceptance. (See curriculum outlines for specific program requirements)

CURRICULUM OVERVIEW

The tech prep curriculum at the secondary level is a core curriculum that is occupationally related and highlights goal setting skills. The course material is practical and relevant and related to the world of work. Courses are also taught in cooperative learning settings and utilize a hands-on approach to learning.

The Principles of Technology is an applied physics course that combines video instruction, printed materials and hands-on lab activities. Students will complete 9 to 14 units in grades 11 and 12 that are based on the application of physics principles in mechanical, fluid, electrical and thermal systems found in modern technical equipment.

Applied or Technical Math I and II is based on an integrated presentation of topics in arithmetic, algebra, geometry, trigonometry, probability, estimation, problem solving, and statistical process control. The 36 modules are designed to be used in two one-year courses and fully reflects the standards set by the National Council of Teachers of Mathematics Two years of Applied Math fulfills the requirements for one year of algebra and a half year of geometry.

Applied Communication teaches communication, language arts and English skills as they apply in the workplace. It is designed to develop and refine job-related communication skills. The curriculum consists of 15 modules that can be used in any order in grades 11 and 12.

Applied Biology/Chemistry consists of 12 units that present scientific fundamentals of biology and chemistry as a unified domain and provides students with hands on activities that relate to work and other life experiences. The units may be taught as a one or two year course or integrated into existing curricula.

The TPAD Program exposes students to a number of career options in technical fields and provides them with the academic and technical skills needed to pursue those careers.

PARTICIPATING TECHNICAL PROGRAMS AT CCRI

The tech prep curriculum at the secondary level prepares students for the following technical programs at CCRI as well as any of the 22 associate degree programs offered at the college:

Chemical Technology
Computer Science
Electronics
Engineering
Engineering Technology (Computer Engineering Technology, Electronic Engineering Technology, Mechanical Engineering Technology)
Instrumentation
Machine Design
Machine Process

OTHER TECH PREP ACTIVITIES

Students who are enrolled in the TPAD Program are invited to participate in a number of career and educational development actitivies during the school year. While in high school, tech prep students visit the Community College of Rhode Island on three occasions. The first visit, which takes place in the Fall, introduces students to the college and faculty and provides them with a general overview of all of the technical programs that are offered at CCRI. At that time, students receive information about career opportunities as technicians in a number of different fields and tour the technical labs to get a first-hand look at the various programs offered at the college.

In the Spring, students return to CCRI for a full day of "hands-on" lab activities and an opportunity to meet and talk with employers from various technical industries and businesses.

High school seniors in the TPAD Program are provided an opportunity to shadow CCRI students who are enrolled in technical programs at the college any time during the school year. A senior luncheon is held in January where students complete math and English placement tests and receive assistance with college applications, financial aid and employment opportunities.

An early registration day is scheduled for those tech prep students who plan to attend the Community College in the fall.

All of these activities help to increase students' awareness of the career opportunities in high technology and the educational requirements needed to successfully pursue a career in a technical field.

Students are also invited to attend a number of workshops that are held throughout the academic year that deal with study skills, time management and financial aid.

Additional programs and activities are scheduled for individual high schools upon request.

GUARANTEED ACCEPTANCE

Students who successfully complete the high school portion of the TPAD Program are guaranteed acceptance into the technical programs at the Community College of Rhode Island.

Criteria for guaranteed acceptance are:

(1) a C or better in the Principles of Technology, Year I and Year II

(2) a C or better in English, grade 11 and 12

(3) a C or better in a math program that meets the requirements of the specific technical program that the student is applying to: for most of the technical programs, a C or better in Applied Math I and II, Elementary Algebra Part I and II, or Algebra I meet the requirements for guaranteed acceptance; however, the Computer Science Program requires that students maintain a B or better in Algebra I, Engineering requires that students complete a minimum of two years of Algebra or equivalent, and Electronic Engineering Technology and Mechanical Engineering Technology require that students complete Algebra and Geometry or the equivalent.

(4) proficiency on the English and Math Placement Tests (see appendix)

Students who successfully complete the high school portion of the TPAD Program will receive a certificate of completion from the Community College of Rhode Island.

Students who do not meet the criteria for guaranteed acceptance will be accepted to the college and will be able to complete their chosen program of study once they have met the academic criteria.

APPLICATION PROCESS

Students enrolled in the TPAD Program who wish to attend the Community College of Rhode Island upon graduation from high school can apply to the college any time during their senior year. They should complete an application that is stamped with "TPAD" which signifies that they are in the TPAD Program and therefore eligible for guaranteed acceptance and waiver of the application fee ($20).

Students will be scheduled for the Math and English Placement Tests and will receive notice of acceptance by mail.

*Stanines are based on Metropolitan Achievement Tests administered in grade 10. Stanines rank ability on a scale of 1 to 9.

SECONDARY/POSTSECONDARY TECH PREP CURRICULUM

SECONDARY LEVEL

GRADE 11	GRADE 12
Principles of Tech. I	Principles of Tech. II
English/Applied Communications	English/Applied Communications
*Math (Applied Math I, Applied Math II, Elementary Algebra Part I, Algebra I	*Math (Applied Math II, Elementary Algebra Part II, Algebra II, Geometry
Phys. Ed.	Phys. Ed.
Other required coursework	Other required coursework
Electives	Electives

POSTSECONDARY LEVEL
COMMUNITY COLLEGE OF RHODE ISLAND

GENERAL EDUCATION REQUIREMENTS	CORE CURRICULUM
Composition I or Technical Report Writing	See individual course descriptions
Algebra for Technology or Technical Math I and II	
Trigonometry for Technology	
Technical Physics or Physics for Technology I, II	
Electives	

*Math requirements vary for some postseecondary technical programs. Applied Math 1 and II may be taught in grades 10 and 11.

SUGGESTED GUIDELINES FOR ENGLISH: SECONDARY LEVEL*

English 1010, Composition I, is the basic English course required by CCRI technical programs. If, after taking the English placement test, a student isn't ready for English 1010, English 1050, Fundamentals of Writing, may be taken in its place. Students who receive credit for English 1050 will not have to take English 1010. English 2100, Technical Report Writing, and English 1100, Oral Communications, are required by some of the technical programs.

The following guidelines were recommended for the high school English portion of the program and a student who has the following competencies should be prepared for English 1010:

a) Write complete sentences - no fragments and no run-ons

b) Write organized single paragraphs

c) Outline

d) Write small essays

e) Grammar: know subject, verb, adjective

f) Punctuation: know comma, period, apostrophe, quotation, colon

g) Critical reading

h) Critical thinking skills

i) Research skills

j) Study skills

The following guidelines were recommended for the high school mathematics portion of the program:

1) Students should begin studying math in the 9th grade and take one math course each year through grade 12;

2) By the end of the 12th grade the students should be proficient in elementary algebra. Students who are proficient at the intermediate algebra level would be able to choose one of the more advanced technical programs;

3) The students should have the following arithematic skills
   a) a working knowledge of addition, subtraction, multiplication, division facts and number concepts
   b) able to add, subtract, multiply, and divide whole numbers, fractions and decimals
   c) find the least common multiple and the greatest common factor
   d) convert fractions to decimals and decimals to fractions
   e) convert fractions to decimals and percents and reverse the process
   f) find the rate, base, and percentage
   g) solve ratio and proportion problems
   h) find rate of increase and rate of decrease
   i) solve numerical geometric and trigonometric problems
   j) understand the concept of exponents and be able to raise a number to any power
   k) solve arithmetic word problems
   l) round decimals to the required number of places
   m) use the metric system of measurement
   n) use approximations to determine if an answer is reasonable

4) The students should have the following geometric skills; these concepts should be taught along with the arithmetic and elementary algebra courses and with their technical courses

a) understand and use the properties of:
- ... a circle-radius, diameter, circumference, area
- ... a rectangle-length, width, perimeter, and area
- ... a triangle-side, length, altitude, perimeter,angular measurements, and area
- ... a right triangle-pythagorean theorem
- ... a rectangular solid-length, width, height, area of the sides, and volume
- ... a cylindrical solid-radius, diameter, circumference, area for surfaces, and volume
- ... a triangular solid (prism)-length, triangular side lengths, triangular altitudes, triangular angles, area of plane surfaces, and volume

b) Each of these figures should be looked at in a real-life situation

c) The students should understand how to construct and interpret graphs, such as circle, bar, and line graphs

5) The students should have the following algebraic skills:

a) add, substract, multiply and divide signed numbers
b) solve linear equations-non-fractional, fractional, decimal, forms with and without parenthesis
c) simplify algebraic expressions
d) factor-common factors, special products, trinomials
e) solve quadratic equations-factoring, completing the square formula
f) graph linear and quadratic functions on the x-y coordinate plane
g) given an algebraic formula solve for a specific letter
h) solve algebraic word problems
i) solve two simultaneous linear equations
j) properties of exponents and radicals

SUGGESTED GUIDELINES FOR TECHNICAL STUDIES*

It was recommended that high schools use the Principles of Technology (Units 1 - 14) for the Applied Physics portion of the program in grades 11 and 12. Students should complete a minimum of 9 units by the end of grade 12.

*These curriculum guidelines were determined by a curriculum committee made up of high school and Community College faculty.

ASSOCIATE DEGREE
COURSES OF STUDY
TECHNICAL PROGRAMS

CHEMICAL TECHNOLOGY
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Algebra for Technology	Trigonometry for Technology
General Biology - Zoology	Modern Technical Physics I
Chemical Tech. I	Chemical Tech II.
Elective - Humanities or social sciences	Composition I

Second Year

First Semester	Second Semester
Chemical Tech. III	Chemical Tech IV
Modern Technical Physics II	General Microbiology
Introduction to Computers or any non-science or math course	Elective - Liberal Arts

JOB TITLES:

Chemical Research Technician

Laboratory Assistant

Chemical Production Technician

Junior Chemist

Analytical Technician

Electronics

Sales Representative

*Students' math selection should prepare them to take Algebra for Technology at the Community College level and to successfully complete the math placement test that is administered at the end of their senior year.

Students who successfully complete this program will receive an Associate Degree in Applied Science.

ELECTRONICS
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Technical Report Writing	Trigonometry for Technology
Algebra for Technology	Electrical Circuits
Technical Physics	Semiconductor Devices
Electrical Fundamentals	Measurements for Electronics
Digital Concepts	Social Science Elective

Second Year

First Semester	Second Semester
Computer Applications	Microprocessors
Communications	Technical Project and Seminar
Analog Circuits	Special Topics
Nonlinear Circuits	Elective
Elective	

JOB TITLES:

Electronic Technician
Electronic Systems Installer/Repairer
Developmental Electronics Assembler

*Students' math selection should prepare them to take Algebra for Technology at the Community College level and to successfully complete the math placement test administered at the end of their senior year.

Students who successfully complete this program will receive an Associate Degree in Applied Science.

ENGINEERING
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Composition I	General Chemistry
Pre-Calculus Math	General Elective
Engineering Graphics	Calculus I
Intro to Engineering and Technology	Engineering Physics (Eng. and Mech.)
Intro to Chemistry or General Chemistry	Liberal Arts Elective
	Scientific Programming

Second Year

First Semester	Second Semester
Calculus II	Calculus III
Intro to Electrical Engineering	Linear Systems & Circuit Theory
Engineering Mechanical	Electrical Engineering Lab
Liberal Arts Electives	Mechanics of Materials (Lab)
Physical Science Elective	Liberal Arts Elective

JOB TITLES:

Design Engineer
Applications Engineer
Project Engineer

*A minimum of two years of algebra or the equivalent is required for admission into the engineering program.

Students who successfully complete this program will receive an Associate in Science Degree.

COMPUTER ENGINEERING TECHNOLOGY
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Technical Math I	Technical Math II
Composition I	Fiber Optic Communications
Programming in Basic	Graphics for Electronics
Fund. of Electricity & Electronics I	Electronic Devices & Circuits I
Intro. to Engineering & Technology	Fund. of Electricity & Electronics II
Engineering Application of Computers	

Second Year

First Semester	Second Semester
Physics for Technology	Operating Systems
Data Base Design & Maintenance	Scientific Programming
Electronic Measurement & Instruments	Technical Project
Digital Electronics	Microprocessors & Microcomputers
Electronic Devices & Circuits II	Liberal Arts Elective
Liberal Arts Elective	

*A minimum of two years of Algebra and one year of Geometry or equivalent is required for acceptance into the program.

Students who successfully complete this program will receive an Associate in Science Degree.

ELECTRONIC ENGINEERING TECHNOLOGY
COLLEGE COURSE OF STUDY
First Year

First Semester	Second Semester
Composition I	Graphics for Electronics
Technical Math	Basic Electronic Circuity theory & Devices
Engineering Applications Comp.	Digital Electronics
BASIC Module	Technical math II
Physics	Physics
Fund. of Electricity & Technology	
Introduction to Engineering & Technology	

Second Year

First Semester	Second Semester
Advanced Electronic Circuit Theory & Devices	Communications Electronics
Electronic Measure & Instruments	Technical Project
Semiconductor Technology	Industrial Electronics and Power
Microprocessors & Microcomputers	Microprocessor Applications & Interfacing
Liberal Arts Elective	Liberal Arts Electives (2)

JOB TITLES: Engineering Technician
Testing Technician

*A minimum of two years of algebra and one year of geometry or equivalent is required for acceptance into the program.

Students who successfully complete this program will receive an Associate in Science Degree.

MECHANICAL ENGINEERING TECHNOLOGY
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Technical Math I	Technical Math II
Composition I	Programming in Basic
Physics for Tech. I	Elective
Engineering Graphics	Manufacturing Processes
Introduction to Robotics	Static & Strength of Materials
Intro. to Engineering & Technology	Design Drafting
	Engineering Applications of Computers
	Cost Estimating

Second Year

First Semester	Second Semester
Liberal Arts Electives (2)	Principles of Production Management
Statistics & Quality Control	Industrial Materials
Basic Mechanisms	Elements of Machine Design
Basic Tool Design	Fund. of Control Electronics

*A minimum of two years of algebra and one year of geometry or equivalent is required for acceptance into the program.

Students who successfully complete this program will receive an Associate in Science degree.

INSTRUMENTATION
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Algebra for Technology	Trigonometry for Technology
Technical Report Writing	Technical Physics
Instrumentation I	Instrumentation II
Electrical Fundamentals	Electrical Circuits
Digital Concepts	Semiconductor Devices

Second Year

First Semester	Second Semester
Control Principles	Technical Project and Seminar
Fundamentals of Electronic Circuits	Electronics for Instrumentation
Social Science Elective	Electives (2)

JOB TITLES: Instrumentation Technician
Product Development Technician
Assistant Control Specialist
Instrument Repairer

*Students' math selection should prepare them to take Algebra for Technology at the community college level and to successfully complete the math placement test that is administered at the end of their senior year.

Students who successfully complete this program will receive an Associate Degree in Applied Science.

MACHINE DESIGN
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Composition I	Trigonometry for Technology
Algebra for Technology	Fasteners & Welding Representation
Technical Drawing - Shape Description II	Technical Drawing-Dimensioning & Tolerancing
Computer Aided Drafting I	Technical Drawing - Working Drawings
Machine Tool Processes I	Manufacturing Processes
	Elective

Second Year

First Semester	Second Semester
Machine Elements	Machine Tool Processes II
Gear Design	Mechanisms
Cam Design	Strengths & Properties of Materials
Jig, Fixture & Tool Design	Gear Trains
Newtonian Physics	Degree Project
Elective	Elective

JOB TITLES:
Machine Technician
Drafter

*Students' math selection should prepare them to take Algebra for Technology at the community college level and to successfully complete the math placement test that is administered at the end of their senior year.

Students who successfully complete this program will receive an Associate Degree in Applied Science.

MACHINE PROCESSES
COLLEGE COURSE OF STUDY

First Year

First Semester	Second Semester
Composition I	Trigonometry for Technology
Algebra for Technology	Mechanical Drawing Basics
Industrial Blueprint Reading	
Lathe I	Lathe II
Mill I	Mill II
Grind I	Grind II
Measurement I	Measurement II
App. Machine Tool Geometry	Elective

Second Year

First Semester	Second Semester
Lathe III	Newtonian Physics
Mill III	Concepts of Numerical Control
Grind III	Machine Processes Project
Diemaking I	Diemaking II
Machinery Handbook	Elective
Elective	

JOB TITLES:
Tool & Die Maker
Manufacturing Engineering Technician
Numerical-Control Machine Tool Operator

*Students' math selection should prepare them to take Algebra for Technology at the community college level and to successfully complete the math placement test that is administered at the end of their senior year.

Students who successfully complete this program will receive an Associate Degree in Applied Science.

PROGRAM AND CAREER INFORMATION

CHEMICAL TECHNOLOGY

DEFINITION: Emphasis on laboratory applications and techniques. Develop fundamental understanding of general. organic and analytical chemistry. This program provides students with a core of chemical information which places more emphasis on practical applications than on theory.

CAREER OPTIONS: This two-year program prepares students to enter the chemical field in any one of a variety of capacities including chemical research technician, laboratory assistant, chemical production technician, junior chemist or analytical technician. **Chemical Technologists** work with chemists and chemical engineers developing and using chemicals and related products and equipment. Most do research and development, testing, or other laboratory work. They set up and conduct tests and experiments, measure reactions, and collect and analyze data. Some chemical technicians collect and analyze samples of air and water to monitor pollution levels.

QUALIFICATIONS: Strong interest in chemical processes and in science, ability to work at repetitive tasks toward a desired end result, ability to work independently and with others, mechanical aptitude and manual dexterity, good health, eyesight and color perception.

EMPLOYERS: Hoechst Celanese, Corp., Philip Hunt, Pfizer, Inc., Davol, Polaroid, IBM, Eastern Color & Chemical Co., and Wel Gen Manufacturing.

SALARY: Average salary $24,960/year.

HIGH SCHOOL REQUIREMENTS: Technical Math I and II or equivalent, Principles of Technology, Technical Communication Skills.

ELECTRONICS

DEFINITION: Study of electronic components used in today's society. Students learn how to calibrate and maintain a system. Emphasis is placed on semiconductor usage. Program includes four computer science courses.

CAREER OPTIONS: Employment in areas of maintaining and repairing electronic equipment, repairing computers, research and development, field service representative in communications fields.

Electronics Technicians develop, manufacture and service a wide range of electronic equipment and systems. They assist engineers in the design and fabrication of experimental models of electronic equipment, set up and repair electronic equipment and systems for consumers, perform inspection and assembly of complex electronic equipment, work with radar, radio, sonar, television, control instrumentation, communication equipment, navigation equipment, electronic computers, data processing equipment and specialize in one or several of these items. Electronics Technicians can engage in sales activities of electronic products, work in research laboratories, test laboratories production prototype fabrication and assembly areas, as well as in design and engineering offices.

QUALIFICATIONS: Good color perception, manual dexterity, good eye-hand coordination, patience, attention to detail and ability to work alone.

EMPLOYERS: IBM, Digital Equipment, Honeywell, Codex, Raytheon, G.T.E. Transcom, G Tech, American Power Conversion, and Telecom Technology

SALARY: Average salary $21,167 (13,500-26,000 range)

HIGH SCHOOL REQUIREMENTS: College Algebra or equivalent (Technical Math I, II), Principles of Technology, Communication Skills

ENGINEERING

DEFINITION: Abstract designing using design principles and mathematical formulas to solve problems. Program includes strong foundation in math, basic sciences and engineering fundamentals as well as liberal arts courses.

CAREER OPTIONS: This program is designed to allow students to transfer curses to a four-year Engineering Degree Program or to obtain employment as an engineering associate or technician.

Engineering Technicians use the principles and theories of science, engineering, and mathematics to solve problems in research and development, manufacturing, sales, and customer service. Their jobs are more limited in scope and more practically oriented than those of scientists and engineers. Many engineering technicians assist engineers and scientists, especially in research and development. Some technicians work on their own, service equipment at customers worksites. Others work in production or inspection jobs.

QUALIFICATIONS: Strong interest in and aptitude for math and science, creativity, able to work with others.

EMPLOYERS: Andon Electronics Corp, BASF Bio Research Corp, Brown & Sharpe, Kenyon Industries, and Texas Instruments.

SALARY: Average salary $32,516/yr ($21,000 - $37,000 range)

HIGH SCHOOL QUALIFICATIONS: Two units of Algebra or equivalent, Principles of Technology, Technical Communication Skills

ELECTRONIC ENGINEERING TECHNOLOGY

DEFINITION: Technicians support the engineer directly as co-workers in design, construction, and testing of engineering models and systems. They also install and maintain electronic equipment. They indirectly act as liaison for an engineering team in production, sales, distribution and maintenance of systems and equipment.

CAREER OPTIONS: Engineering technicians use the principles and theories of science, engineering and mathematics to solve problems in research and development, manufacturing, sales, and customer service. Their jobs are more limited in scope and more practically oriented than those of scientists and engineers. Many engineering technicians assist engineers and scientists, especially in research and development. Some technicians work on their own, servicing equipment at customers' worksites. Others work in production or inspection jobs. Electrical and electronics technicians develop, manufacture, and service equipment and systems such as radios, radar, sonar, television, industrial and medical measuring of control devices, navigational equipment, and computers, often using measuring and diagnostic devices to test, adjust, and repair equipment. Mechanical engineering technicians work with engineers in design and development by making sketches and rough layouts of proposed machinery and other equipment and parts. They record data, make computations, plot graphs and analyze results, and write reports when planning and testing experimental machines. When planning production, mechanical engineering technicians prepare layouts and drawings of the assembly process and of parts to be manufactured. They estimate labor costs, equipment life, and plant space.

QUALIFICATIONS: Science and math aptitude, creativity, able to work with others.

SALARY: Average salary $18,720

HIGH SCHOOL REQUIREMENTS: Algebra or equivalent, Principles of Technology, Technical Communication Skills

INSTRUMENTATION TECHNOLOGY

DEFINITION: Student is trained to install, maintain, repair and calibrate instruments used in the production of products. Study of instruments used in process control (can be mechanically controlled by hand or electronically by computer). Process from raw to finished product. Example: production of paper, chemicals, be r, film, etc.

CAREER OPTIONS: An instrument technician services instruments which are used to measure, record, analyze and control product output and processes in research and industry. They overhaul and service instruments used to measure hydraulic pressure, fluid flow, rate of change of position, direction, altitude, time, intervals of time and a wide variety of moving indicator devices. They inspect faulty instruments and diagnose malfunctions using manufacturers' manuals, by disassembly and visual inspection of special test jigs, chambers and other apparatus designed especially for certain types of instruments. They reassemble, test and calibrate using high standard instruments to ensure accuracy and minimal instrument error. They install special laboratory test equipment and calibrate to manufacturers' specifications.

QUALIFICATIONS: Good manual dexterity and eye hand coordination, good vision and color perception, patience and ability to work alone and with others.

EMPLOYERS: Honeywell, Davol, Narragansett Electric, Hoechst Celanese, Corp., Polaroid, Electric Boat, Foxboro Company, Sylvania, Gulton and B.I.F.

SALARY: Average salary $25,000 (Salary range 20,000 - 31,000)

HIGH SCHOOL REQUIREMENTS:

Principles of Technology, Technical Math I and II, Technical Communication Skills

MACHINE DESIGN

DEFINITION: Design of products or mechanisms used in manufacturing. The Machine Designer works closely with the Engineer using drafting to design solutions (drawings that include specifications) to proposed problems. They may design new products or redesign existing products to make them more efficient. Upon completion of this program, the student is qualified for employment as a technician in the design of industrial products as well as industrial machinery.

CAREER OPTIONS: Employment as a draftsman with potential to advance to Machine Designer. A drafter prepares detailed drawings from rough sketches, specifications and calculations of a wide variety of products. Drafters draw plans of a wide variety of items and show entire item and individual parts complete with dimensions and tolerances. They calculate strength, quality and cost of materials used in the final item. Drafters prepare final drawings containing detailed views of objects and specifications of materials to be used as well as procedures to follow in the fabrication. They work with drafting tools such as compasses, dividers, protractors, triangles and drafting machines.

QUALIFICATIONS: Drafters must be able to perform detailed work accurately, have good eyesight and eye-hand coordination, be able to work independently and as a team member, have artistic ability to do freehand sketching of three-dimensiona. objects and have the ability to letter with or without drafting a .

EMPLOYERS: B.I.F, Stanley Bostitch, Inc., A.T. Cross, Electric Boat, G & E Safety Equipment, GTE, and Toray Plastics.

SALARY: Average salary $23,000/yr

HIGH SCHOOL QUALIFICATIONS: High school Algebra or equivalent, Principles of Technology, Technical Communication Skills

MACHINE PROCESSES

DEFINITION: Production of tools or elements designed by Machine Designer. This program enables students to gain knowledge in construction of machine tools (theoretical and practical phases of design, cost, and production of tools, dies and machine parts) and the principles underlying their operation.

CAREER OPTIONS: Employment in the metal working industry. Other options include enrolling an Apprentice Tool and Die Making Program or a four-year Industrial Technology Program. **Tool and Die Makers** are highly skilled workers who produce tools, dies, and special guiding and holding devices that are used in machines that produce a variety of products. Toolmakers produce jigs and fixtures. They also make gauges and other measuring devices used in manufacturing precision metal parts. They also repair worn or damaged tools.

QUALIFICATIONS: Mechanical aptitude, manual dexterity, good eye-hand coordination, accuracy, dependability, pride in skills, attention to detail, good spatial judgment and ability to work alone.

EMPLOYERS: A.T. Cross, Bostitch, Carbon Tech, Federal Products, Madison Industries, Speidel, Tedco, Texas Instruments, Tower Manufacturing Co., General Dynamics, Evans Co., and A.T. Wall

SALARY: Average salary $31,010/yr ($27,019-$35,000 range)

HIGH SCHOOL REQUIREMENTS: Technical Math I and II or equivalent, Principles of Technology, Technical Communication Skills

TECH PREP BUSINESS/OFFICE ADMINISTRATION ASSOCIATE DEGREE PROGRAM

COMMUNITY COLLEGE
OF RHODE ISLAND

ARTICULATION IN THE COMPREHENSIVE AND VOCATIONAL HIGH SCHOOL

The Tech Prep Business Administration/Office Administration Program is a high school/community college partnership program which provides an alternative program of study in Business Administration or Office Administration for high school students who are enrolled in general education or vocational programs.

This is a four-year program that begins in grade 11 and culminates with an Associate Degree. Students enroll in a focused course of study at the high school level in Business, math and English - all taught in an applied setting and have the opportunity to earn college credit from the Community College of Rhode Island as well as high school credit for some of the courses in the program.

The curriculum at the secondary level is a core curriculum that is occupationally related and highlights goal setting skills. The Tech Prep Business Administration/Office Administration Program encourages students to explore a number of career options in these fields and prepares them to enter a Business or Office Administration Program at the college level.

STUDENT SELECTION

Students are targeted for the Tech Prep Business Administration/Office Administration Program in grades 9 and 10 and begin the program in grade 11. The kinds of students likely to enroll in the program are those students who are in an unfocused general education program of study, lack career and educational goals and have an interest in the Business or Office Administration fields.

Students are identified for the program by their high school guidance counselors, English teachers, math teachers and business teachers. The high school guidance counselors officially enroll students in the program when they complete grade 10.

The program is designed for the average student in the middle two quartiles who falls between a 4 and 7 stanine.* The recruitment process includes

... information letters to parents and students
... orientation presentations and meetings
... student interviews and counseling sessions
... selection meetings

... parent orientations
... distribution of promotional materials

To assist with student recruitment, tech prep staff at the Community College of Rhode Island are available during the school year to conduct student and parent orientations at the high schools, and a number of promotional materials are available for dissemination.

Once selected, students will receive an informational packet on tech prep and will be invited to visit the Community College for an introduction to the program.

Introduction to Business & Elementary Accounting I
Course Outlines

CCRI will provide Curriculum Course Outline.

CCRI faculty in conjunction with high school faculty will develop the four quarterly tests.

Administering & grading of four quarterly tests will be completed by high school faculty.

High schools will use the same textbook as used by CCRI.

Quizzes, problems, papers, projects, or other related activities will enhance the appreciation of subject material & will be used in conjunction with the four quarterly test when determining student's final grade.

The high school teacher determines the student's final grade for Introduction to Business & Elementary Accounting I.

CCRI recommends Introduction to Business be completed in the junior year of high school.

NOTE: The same textbook is used in Elementary Accounting I & II at CCRI. CCRI recommends that high school faculty encourage high school students to purchase the Elementary Accounting I textbook.

Course Credit Criteria

Students will receive Community College of Rhode Island credit contingent upon the following criteria:

1. Students must be enrolled in the Tech Prep Business Program at the completion of their sophomore year in high school.

2. Students must complete & pass Introduction to Business course at the high school.

3. Students must complete & pass Elementary Accounting I course at the high school in their senior year.

4. Students must graduate from high school & matriculate into the Business Administration Dept. at CCRI.

5. Students must complete & pass 12 credit hours or more at CCRI which will include Accounting II.

TECH PREP BUSINESS/OFFICE ADMINISTRATION COURSE OF STUDY-SECONDARY LEVEL

Business Administration Program

Grade 11	Grade 12
English with Applied Communications component	English with Applied Communications component
Applied math I or equivalent	Applied Math II or equivalent
Introduction to Business (3 CCRI credits)*	College Accounting (4 CCRI credits)*
Accounting I	
Other required courses	Other required courses

Office Administration Program

Grade 11	Grade 12
English with Applied Communications component	English with Applied Communications component
Applied Math I or equivalent	Applied math II or equivalent
Keyboarding (with CCRI challenge credit)	Secretarial Procedures (3 CCRI credits)*
Shorthand or Speedwriting (with CCRI challenge credit)	College Accounting (3 CCRI credits)*
Other required courses	Other required courses
Business electives	Business electives

*These courses are one semester college courses that are taught at the high school for a full academic year. They are taught by the high school faculty. Suggested proficiency in English and Math are the same as outlined in the tech-prep curriculum guidelines.

ASSOCIATE DEGREE COURSES OF STUDY

BUSINESS ADMINISTRATION/ OFFICE ADMINISTRATION

ASSOCIATE DEGREE
COURSES OF STUDY
BUSINESS ADMINISTRATION

The following courses are required of business administration students in any program concentration - Accounting, General Business Administration and Management.

Principles of Economics I
Principles of Economics II
Composition I (or English 1050)
Oral Communication I
A one-semester literature course
Math -Varies with course selection;
see course descriptions
(two semesters)
Two electives from Social Sciences;
Geography, History, Labor Studies, Philosophy,
Political Science, Psychology or Sociology
Elementary Accounting I and/or II
Law of Contracts
Law of Real Property, Estates or
Law of Business Organization or
Commercial Paper and Secured Transaction
Principles of Management
Principles of Marketing

ACCOUNTING CONCENTRATION

Students must complete Accounting 2010, Accounting 2020 and at least two other courses from this list:

Income Taxes I
Intermediate Accounting I
Intermediate Accounting II
Principles of Financial Management
Statistical Analysis I
Introduction to Computers
Cooperative Work Experience

GENERAL BUSINESS ADMINISTRATION CONCENTRATION

Students must select at least 13 credits from this list:

Introduction to Computers
Income Taxes I
Statistical Analysis I
Applied Business Psychology
Introduction to Business
Cooperative Work Experience

MANAGEMENT CONCENTRATION

Students must select at least 13 credits from this list:

Introduction to Computers
General Sociology
Income Taxes I
Applied Business Psychology
Managerial Accounting
Principles of Financial Management
Statistical Analysis I
Cooperative Work Experience

LAW ENFORCEMENT CONCENTRATION

Year I	Year II
Fall	**Fall**
Oral Communications I	State & Local Gov't.
Introduction to Computers	Algebra for Technology
Criminal Law	Composition I
General Sociology	Criminalistic I
Administration of Justice	Criminal Law & the Constitution
Spring	**Spring**
Psychology of Personal Adjustment or General Psychology	Principles of Management
Criminalistic II	Criminology
Law of Evidence	Law and Society
Constitutional Law	Elective
Elective	Elective

Electives

Elements of Economics
Interviewing Skills
Penology
Survey of Labor Relations
Drugs & Human Behavior
Cooperative Education Experience

ASSOCIATE DEGREE
COURSES OF STUDY
OFFICE ADMINISTRATION

OFFICE ADMINISTRATION WITH SHORTHAND OPTION
Year I

Fall	Spring
Shorthand Theory: Gregg Speedwriting or Advanced Shorthand Theory	Shorthand Dictation/ Transcription or Advanced Shorthand Dictation and Trams.
Keyboard Application for for Business I or Advanced Keyboarding Applications for Bus.	Keyboard Application for Business II
Editing Skills for Trans. I	Editing Skills for Transcription II
Office Accounting	Administrative Office Proc. I
Introduction to Comp. Business for Sec.	Business Math Introduction to Word Processing

YEAR II

FALL	Spring
Administrative Dictation & Transcription Administrative Office Procedures II Applied Document Processing I	Applied Document Processing II Law of Contracts Cooperative Work Experience I or II Career Devel-opment for Office Occupations
Oral Communication I Psychology of Personal Adjustment Cooperative Work Exp.	Composition I Administrative Office Mngt. Social Science Elec.

OFFICE ADMINISTRATION WITH MACHINE TRANSCRIPTION OPTION

YEAR I

FALL

Business File Management
Keyboard App. for Business I or Advanced Keyboarding Applications for Bus.
Editing Skills for Transcription I
Office Accounting

Introduction to Computers
Business Writing for Secretaries

SPRING

Administrative Machine Trans. I
Keyboard App. for Business II

Editing Skills for Transcription II
Administrative Office Procedures I
Business Math

Introduction to Word Processing

YEAR II

FALL

Administrative Machine Transcription II
Administrative Office Procedures II
Applied Document Processing I

Oral Communication I
Psychology for Personal Adjustment
Cooperative Work Experience

SPRING

Applied Document Processing II
Law of Contracts

Cooperative Work Experience I or II
Career Development for Office Occupations
Composition I
Administrative Office Mngt.
Social Science Elective

LEGAL ADMINISTRATIVE ASSISTANT/SECRETARY
YEAR I

Same as Office Administration with Shorthand or Machine Transcription Option

YEAR II
SHORTHAND OPTION

FALL	SPRING
Legal Dictation Trans.	Applied Document Processing I
Legal Document Processing	Cooperative Work Experience I or II o
Career Occupations	Development for Office
Law of Contracts	Legal Office Administration
Oral Communication I	Legal Forms & Terminology
Cooperative Work Exp. I	Psychology of Personal Adjust.
	Social Science Elective

MACHINE TRANSCRIPTION OPTION

FALL	SPRING
Administrative Machine Transcription II	Applied Docu-Processing II
Legal Document Processing	Cooperative Work Experience I or II o Career Develop-ment for Office Occupations
Law of Contracts	Legal Office Administration
Law of Business Organization	Legal Forms & Terminology
Oral Communications I	Psychology of Personal Adjust.
Cooperative Work Exp. I	Social Science Elective

MEDICAL ADMINISTRATIVE SECRETARY/ASSISTANT

YEAR I

Same as Office Administration with Shorthand or Machine Transcription Option

YEAR II

FALL	SPRING
Medical Document Processing	Medical Machine Trans. II
Medical Terminology	Medical Cooperative Work Exp.
Anatomy & Physiology	Medical Office Administration
Psychology of Personal Adjustment	Introduction to Pharmacology
Oral Communication I	Clinical Procedures
Cooperative Work EXp.	Composition I
Elective	Social Science

APPENDIX

SAMPLE PLACEMENT-TEST QUESTIONS: ENGLISH

WRITING PART I:

Directions: In each of the following sentences find out what is wrong, if anything. In deciding whether there is something wrong with a sentence, consider the way a sentence should be written in standard written English, the kind of English usually found in textbooks. Remember that this is sometimes different from the kind of English that you use in talking with your friends.

Some sentences are acceptable without change.
No sentence contains more than one error.

If the sentence has an error, you will find that the error is underlined and lettered. Assume that all other parts of the sentence are acceptable and cannot be changed.

When you find an error, select the one underlined part that must be changed in order to make the sentence acceptable, and blacken the corresponding circle on the answer sheet.

If there is no error, mark circle D.

Sample Questions	Sample Answers
1. Tom ate (A) the hamburger, it (B) was good. (C) No error (D)	1. (A) (B) (C) (D)
2. Next week Mrs. Wilson has visited (A) her (B) sister in Chicago. (C) No error (D)	2. (A) (B) (C) (D)

You will have 10 minutes to work on the 20 questions in Part 1.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

WRITING PART II:

Directions: In each of the following sentences some part of the sentence or the entire sentence is underlined. Beneath each sentence you will find four ways of writing the underlined part. The first of these repeats the underlined part in the original sentence, but the other three are all different. If you think the original sentence is better than any of the suggested changes, you should choose answer A; otherwise you should mark one of the other choices. Select the best answer and blacken the corresponding circle on the answer sheet.
In choosing your answers, follow the requirements of standard written English, the kind of English usually found in textbooks.

Remember that it is sometimes different from the kind of English you use in talking with your friends. Pay attention to how clearly ideas are expressed, whether the words convey the meaning they are supposed to convey, and how the sentence is constructed and punctuated. Choose the answer that produces the most effective sentence--clear and exact, without awkwardness or ambiguity. Do not make a choice that changes the meaning of the original sentence.

Sample Questions	Sample Answers
1. Caroline is studying mathematics because she has always wanted to become <u>it</u>. (A) it (B) one of them (C) a mathematician (D) one in mathematics	1. (A)(B)(C)(D)
2. Because Mr. Thomas was angry, <u>he spoke</u> in a loud voice. (A) he spoke (B) and speaking (C) and he speaks (D) as he spoke.	2. (A)(B)(C)(D)

You will have 15 minutes to work on the 20 questions in Part 2.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

WRITING PART III:

<u>Directions:</u> Choose one of the topics listed below and develop that topic during the specified time allowed. This paper will be used to judge your grasp of grammar rules and to see what your personal writing style is like.

SAMPLE PLACEMENT-TEST QUESTIONS

The Placement Test has four parts with 17 questions in each part: Part I — ARITHMETIC, Part II — ELEMENTARY ALGEBRA, Part III — INTERMEDIATE ALGEBRA, and Part IV — TRIGONOMETRY. Many of the following questions are quite similar to those on the Placement Test. Review only the underlined courses listed above that you have previously studied; don't worry about those you have never had.

A mathematics instructor will discuss with you your test results, and recommend a math course that is consistent with your background and educational objectives. However, the decision as to which course you take is yours!

SAMPLE QUESTIONS

PART I — ARITHMETIC

1. Subtract: $5\frac{1}{5} - 3\frac{2}{3}$
2. Divide: $2\frac{1}{3} \div \frac{1}{2}$
3. Add: $38 + 3.8 + .38$
4. 2.3 is what percent of 7? Round your answer to the nearest tenth percent.
5. The ratio of men to women in a community college is 4 to 5. How many women attend if there are 7600 men?

PART II — ELEMENTARY ALGEBRA

6. Perform the indicated operations: $-2(5 - 7) - 6$
7. Express as a single fraction in simplest form:
$$\frac{x}{2} - \frac{2x + 2y}{4y}$$
8. Solve: $3 - 2(x + 4) = x$
9. Solve: $5 - \frac{3x}{4} = 2x$
10. Solve for F: $C = \frac{5}{9}(F - 32)$

PART III — INTERMEDIATE ALGEBRA

11. Rationalize the denominator and simplify:
$$\frac{\sqrt{8} + 3\sqrt{2}}{5\sqrt{3}}$$
12. Express in simplest form without negative exponents:
$$\left(\frac{x^3 \cdot y^2}{xy}\right)^{-1}$$
13. Solve this system of equations: $2x - y = 4$, $3x - 2y = 1$
14. Solve: $3\sqrt{x} - x = 2$
15. Given the coordinates of the two points P_1 (1,2), P_2 (-2,3), determine the slope.

PART IV — TRIGONOMETRY

16. Graph the sine and cosine functions on the same axes. Then determine the interval(s) below for which $\sin\theta > \cos\theta$: ($0^\circ \le \theta < 90^\circ$, $90^\circ \le \theta < 180^\circ$, $180^\circ \le \theta < 270^\circ$, $270^\circ \le \theta < 360^\circ$).
17. Solve for all values of θ such that $0 \le \theta < 360^\circ$:
$$2\sin^2\theta - \sin\theta = 0$$
18. Given that $\cos\theta = \frac{\sqrt{2}}{2}$, determine the values of θ between 270° and 450°.
19. Express as a single trigonometric function in simplest form:
$$\frac{\csc\theta}{\cot\theta}$$
20. Given that $\tan\theta = -\frac{2}{3}$ and θ is in Quadrant II, determine the value of $\sec\theta$.

ANSWERS

1. $1\frac{8}{15}$
2. $4\frac{2}{3}$
3. 42.18
4. 32.9%
5. 9500 women
6. -2
7. $\frac{xy - x - y}{2y}$
8. $x = -\frac{5}{3}$
9. $x = \frac{20}{11}$ or $1\frac{9}{11}$
10. $F = \frac{9}{5}C + 32$ or $\frac{9C + 160}{5}$
11. $\frac{\sqrt{6}}{3}$
12. $\frac{1}{x^2y}$
13. (7,10)
14. 1,4
15. $-\frac{1}{3}$
16. $90^\circ \le \theta < 180^\circ$
17. $0^\circ, 30^\circ, 150^\circ, 180^\circ$
18. $315^\circ, 405^\circ$
19. $\sec\theta$
20. $-\frac{\sqrt{13}}{3}$

2 Tech-Prep 2 Associate Degree Program

Community College of Rhode Island

Congratulations! You have been selected to participate in the 2 + 2 Tech-Prep Associate Degree Program, a partnership program between the Community College of Rhode Island and _____ _____ High School.

As a participant in this program, you will be asked to meet the following program objectives:

... complete two years of the Principles of Technology in grades 11 and 12 or one year of Principles of Technology and one year of another science

... complete four years of Math beginning in grade 9 to include Applied Math I and II or equivalent and Algebra I

... complete four years of English to include one year of Applied Communications or equivalent

... participate in a series of career development activities conducted by the Community College of Rhode Island in grades 10, 11, and 12

When you successfully complete the first two years of the 2 + 2 TPAD, CCRI will

... guarantee your acceptance into a technical program at the college

... schedule an early registration day for course selection for 2 + 2 TPAD students

... waive the $10 application fee for 2 + 2 TPAD students

Knight Campus • 400 East Avenue, Warwick, Rhode Island 02886-1807 • (401) 825-2143

2 Tech-Prep 2 Associate Degree Program

Community College of Rhode Island

2 + 2 STUDENT CONTRACT

I UNDERSTAND THAT THE 2 + 2 PROGRAM REQUIRES A TWO-YEAR COMMITMENT. I UNDERSTAND THAT I MUST ENROLL IN THE REQUIRED COURSES FOR MY CHOSEN PROGRAM OF STUDY AND PARTICIPATE IN THE PROGRAM ACTIVITIES WHICH WILL INCLUDE INFORMATIONAL WORKSHOPS AND VISITS TO THE COMMUNITY COLLEGE OF RHODE ISLAND. I UNDERSTAND WHAT IS EXPECTED OF ME IN THIS PROGRAM AND I WILL DO MY BEST TO FULFILL THE PROGRAM REQUIREMENTS.

STUDENT SIGNATURE: _____

SCHOOL: _____

DATE: _____

AS A PARENT/GUARDIAN, I SUPPORT _____

PARTICIPATION IN THE 2 + 2 PROGRAM.

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Tech-Prep / Associate Degree Program

2 + 2

Community College of Rhode Island

This is to certify that _____ *is participating in the 2 + 2, Tech-Prep/Associate Degree Program and has successfully completed the program requirements for the first year.*

Robert A. Silvestre

Vice President, Academic Affairs

Director, 2 + 2

"2 + 2" TECH PREP ARTICULATION AGREEMENT

The Community College of Rhode Island (CCRI) and the secondary school members of the "2 + 2" Tech Prep Consortium heretofore agree to commit to a program designed to provide students with a nonduplicative sequence of progressive achievement leading to competencies in the Tech Prep Program.

The Tech Prep Program is defined as a combined secondary and postsecondary program which leads to an associate degree or two year certificate; provides technical preparation in at least one field of engineering technology, applied science, mechanical, industrial, or practical art or trade, agriculture, health or business; builds student competence in mathematics, science, and communications (including applied academics) through a sequential course of study; and leads to placement in employment.

The attached Addendum, which is hereby made part of this agreement, describes and details the processes that will be used to develop and maintain the "2 + 2" Tech Prep Consortium in terms of:

-development of curricula
-inservice training for teachers
-training for counselors
-equal access to special populations
-preparatory services
-sample student contract which outlines the student's commitments to participation

The Community College of Rhode Island agrees to the following:

1. To disseminate "2+2" descriptive materials and consortium application guidelines/surveys to all public school systems in the state prior to the beginning of each academic year through a direct mail process.

2. To host and coordinate annual orientations to the Tech Prep Program for students, administrators, guidance counselors and teachers at the beginning of each academic year.

   On-site orientations and technical assistance will be scheduled on an as needed basis at the request of individual secondary schools, based upon the availability of the "2 + 2" staff.

3. To conduct discipline specific inservice training workshops scheduled for secondary school teachers interested in adopting any of the available applied curricula (contingent upon availability of funds.)
4. To guarantee students who successfully complete the high school segment of the "2 + 2" Tech Prep Program acceptance into a technical program at the College; to provide an early registration day for course selection; and to waive the College's application free for any

Consortium member's students who successfully complete the first two years of the "2 + 2" Tech Prep Associate Degree Program (see Addendum for student Contract specifics.)

The secondary school members agree to the following:

1. To institute at least one of the applied Tech Prep curricula in math, science, communications, and/or the technologies in the first year of participation.

2. To develop a plan for instituting additional applied curricula in subsequent years of participation in the Consortium.

3. To allow teachers and counselors to attend relevant inservice training workshops;

4. To allow Tech Prep students to attend the Fall orientation; the annual Career Day; and the annual senior activity hosted by the College.

5. To allow faculty to participate in secondary/post-secondary articulation meetings on a semiannual basis.

6. To allow a representative to participate in the "2 + 2" Tech Prep evaluation design and to supply the necessary student data to the College upon request.

7. To provide the College with a written explanation as to how special populations shall be integrated into Tech Prep Programs and a description of resources to be provided as soon as possible, but no later than the end of the calendar year. This information is required by the Division of Vocational and Adult Education to meet funding requirements.

8. To include a copy of this mutually signed Articulation Agreement in any and all proposals that are submitted to the RI Division of Vocational and Adult Education for the purposes of obtaining "2 + 2" Tech Prep funding.

This agreement shall remain in effect through June 30, 1992 and is subject to renewal on an annual basis with the consent of both parties.

Principal	Edward J. Liston, President Community College of RI
Date	Date

ADDENDUM

1. Development of Curricula

The Division of Vocational and Adult Education will obtain the proper distribution licenses to disseminate Tech Prep applied curricula materials from the Center for Occupational Research and Development, Agency for Instructional Technology, and/or other publishers.

Participating secondary and postsecondary (CCRI) faculty in the "2 + 2" Tech Prep Consortium will jointly review and adapt the materials for implementation. Semiannual meetings among participating faculty, scheduled by academic discipline, will be hosted by CCRI for this purpose. The review process shall continue for each discipline throughout FY's 92, 93, and 94. Additionally, if a new applied curriculum is to be introduced, the curriculum will be field tested at one or two sites prior to the full scale adoption of the curriculum throughout the state.

2. In Service Training for Teachers

CCRI will be responsible for surveying Consortium members on an annual basis and developing an inservice training plan for participating secondary and postsecondary faculty members.

A total of seven inservice trainings will be scheduled for FY 92; two in Principles of Technology; two in Applied Math I and II; two in Applied Communications; and one in Applied Biology/Chemistry. Similar training plans will be developed in response to survey results for FY 93 and 94 (contingent upon availability of funds). A peer training model is used. The trainers for the inservice workshops have been trained by the National Center for Occupational Research and Development, the organization that has developed most of the applied curricula materials being used in RI.

The inservice trainings are held at CCRI's campuses, which are geographically accessible to all parts of the state.

CCRI has established an applied physics lab at its Providence campus and is planning to expand the lab to include the applied curriculum for biology/chemistry during FY 92. This lab is available to any of Consortium members as a training resource for staff and students on a scheduled basis. The "2 + 2" Project Director at CCRI should be contacted for scheduling use of these facilities.

The physics inservice training is a three-day training program (six to seven hours a day) and the secondary school teachers receive one credit from CCRI which can be used for teacher certification update or renewal. The same model and credit process is planned for the biology/chemistry inservice. The

applied math and applied communications workshops are half day to one day training sessions.

In addition to the inservice training on the applied academic curricula, inservice workshops are also held to assist teachers in improving and diversifying their teaching methodologies. Since "2 + 2" students undergo both academic assessments and learning style assessments, this information is used to instruct teachers as to which strategies work best with the identified learning styles. Such workshops also focus on motivating and retaining at-risk, and/or disadvantaged students in the classroom.

All workshop sessions are evaluated by participants and the evaluation data is reviewed and used in the Consortium's planning process.

3. Training Programs for Counselors

During FY 92, counselors will be invited to CCRI's "2 + 2" inservice trainings that focus on identifying various learning styles, assisting special populations, and motivating at-risk students; the student orientations; and will receive newsletters on the Tech Prep Program. Topics for these 2-3 hour workshops, which are held four times a year, are as follows:

-Understanding High Technology and its Application to the Manufacturing Process
-Working with "High Risk" Students - A Teacher's Perspective
-Strategies for Test Construction and Evaluation for the "High Risk" Student
-Learning Styles

Results obtained from the academic placement testing in Math and English are shared and analyzed with the counselors on an individual basis.

Inservice training workshops that are specifically and solely targeted toward counselors will be designed for FY 93 and 94 based upon survey data collected in FY 92 from participating Tech Prep counselors, teachers, and administrators (contingent upon availability of funds).

4. Strategies to Provide Equal Access to Members of Special Populations

Consortium members must conform to a non-discriminatory policy and adhere to their respective EEO and Affirmative Action guidelines as public educational institutions. Consortium members are required to submit a written description of the resources that will be made available to special populations within their school system who wish to access the Tech Prep Program. This description shall be submitted to CCRI, which

is the administrative entity for the Tech Prep Consortium.

CCRI will provide the following services

Outreach with community based agencies and referral services.

Tech Prep administrators and other employees have been and will continue to be encouraged to actively support and personally participate in meaningful interracial community action programs.

The Affirmative Action Officer of the postsecondary partner will continually meet with community leaders, minority group organizational heads, and persons who work with or have contact with large segments of the states minority and handicapped population.

The postsecondary partner has and will continue whenever possible to coordinate on-campus tours and lend the use of its facilities to community-based groups for various meetings, seminars, and cultural activities.

Continued emphasis will be placed upon Tech Prep students and staff's participation in programs oriented toward minorities, handicapped, and females.

Orientations on Affirmative Action and EEO policies and workshops on discrimination, cultural awareness, and sexual harassment shall be conducted for staff.

Notices on non-discrimination and sexual harassment policies shall be prominently displayed.

The postsecondary partner's Admissions Office is and will continue to be in contact with various community organizations while handling student recruitment.

The postsecondary partner's Office of Student Services will work to alleviate the physical barriers on campus and will make an extensive effort to ensure that State and Federal regulations on discrimination toward disabled persons are fully implemented.

The postsecondary partner's Office of Student Services will provide services in the following areas: parking, scheduling of classes, readers when necessary, note takers, adjustment counseling, and interpreters.

Will encourage and facilitate the development of student clubs for special populations.

Access to services provided under grant funds such as:

Non-traditional Careers
Single Parents and Homemakers Reentering Education and Employment Program
Adult Basic Education and GED Programs
ESL courses
TRIO Programs
Sex Equity Resource and Training Center

A mailing list of organizations serving special populations shall be maintained for purposes of public relations and information sharing.

Whenever possible, minority group employees, handicapped, and women will be featured in news releases, employment, and Tech Prep publications and reports.

The postsecondary partner's Director of Affirmative Action shall review all publications.

The postsecondary partner's Affirmative Action Officer will continually review admission applications and other pertinent data to ensure that the College is not discriminating in its admission programs.

5. Strategies to Provide Preparatory Services

CCRI will schedule annual on-site presentations to students in grades 9 and 10 to introduce the "2 + 2" Tech Prep curriculum and Associate Degree Program option to them.

Summer workshops to address study skills, test taking techniques, note taking, stress management, and time management will be conducted; academic assessment services will be provided and tracked; and enrichment and/or developmental summer courses in Math, English, or Technology will be offered by CCRI to entering freshmen (contingent upon availability of funds).

Participating secondary schools shall be responsible for articulating the Tech Prep curricula within their own schools.

TECH PREP/ASSOCIATE DEGREE
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