Public Schools of North Carolina
State Board of Education
Department of Public Instruction

# Report to the Joint Legislative Education Oversight Committee

## Relationship Between Academic Rigor and Reducing the School Dropout Rate

*SL 2002-178, Section 2 ( c )*

*(SB1275)*

**Date Due: January 15, 2003**
Report # 24 in October 2002-December 2003
DPI Chronological Schedule

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Michael E. Ward, State Superintendent

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## Executive Summary

Senate Bill 1275, Dropout Reduction/LEA Accountability, was ratified on September 23, 2002 and requires the State Board of Education to study and/or report on five components of the law. Two (2) of these sections required reports due on December 15, 2002 and were submitted to the Joint Legislative Education Oversight Committee in December. The two sections addressed in the December report were

(1). (a). the State Board's statewide plan to improve the tracking of dropout data so that accurate and useful comparisons can be made over time, and

(2). (b). identification of technical high schools and career centers currently in operation and recommendations to strengthen concurrent enrollment opportunities between technical high schools and career centers and community colleges. This component must be done in collaboration with the State Board of Community Colleges.

Section 2 (c ) directs the State Board of Education to study the relationship between academic rigor and reducing the school dropout rate. This report is due on January 15, 2003. As part of this study, the Board shall include the following:

(1). The development of a proposal to accelerate the learning of students able to complete high school in three years;

(2). The elimination of low-level classes at the middle and high school levels;

(3). The examination of the appropriateness of electives and exploratory courses at the middle school level;

(4). A review of current vocational courses to determine the rigor of the content; and

(5). The development of up-to-date standards for vocational/technical teachers.

This report outlines the detailed plan that the State Board of Education will implement to comply with the initial three components of Section 2 (c ) of SB 1275. The remaining two components regarding vocational/technical education have been completed. The recently revised Career - Technical Education Standard Course of Study is included in part four of this report and the most recently revised professional teaching standards for career – technical education are included in part five.

The Department of Public Instruction (DPI) will carry out the following steps for items 1, 2, and 3 above:

1. DPI staff will engage in intensive research to identify best practices currently in place and those that are promising. The Divisions of School Improvement and Instructional Services will conduct the research. A listing of the sources of information is included in this report. However, as other sources are identified, they will be studied.
2. DPI staff will analyze reasons for students dropping out of school for a ten-year period to determine trends and implications for academic rigor.
3. DPI staff will carefully analyze all research finding and conduct an in-depth discussion to evaluate the findings in terms of their appropriateness for North Carolina.
4. DPI staff will develop recommendations for Statewide implementation of each of the areas and present the recommendations to the State Board for discussion on May 7, 2002

Following action by the State Board of Education in June, the final report and recommendations will be forwarded to the Joint Legislative Education Oversight Committee.

# Introduction

For the 2000-01 school year, 1,956 students, or 8.49% of all dropouts in North Carolina (23, 034), were attributed to academic problems. Other reasons for dropping out such as attendance problems, choice of work over school, enrolling in a community college, discipline problems, health problems and the necessity of work also contributed to academic problems that can lead to dropping out. This statistic demonstrates that academic rigor or in many instances the lack of academic rigor often influences a student's decision to drop out of school. Both the State Board of Education and Department of Public Instruction are committed to increasing academic rigor in all schools. In an earlier study (May 2001), *Increasing Opportunity to Learn via Access to Rigorous Courses and Programs: One Strategy for Closing the Achievement Gap for At-Risk and Ethnic Minority Students*, the researchers received surveys from approximately one-half of North Carolina's high schools. From those respondents, approximately one-half allow self-selection into Honors courses (57%), AP courses (48%) and dual enrollment into college/community college courses (42%). However, about one-fourth of the high schools surveyed reported that qualified students decline placement in AP courses " 'often or very often.' " In addition, not all high schools are able to offer a large number of advanced courses for logistical and other reasons. So the challenges to academic rigor appear both in terms of access and placement as well as student motivation.[1]

Until 1960, more than one-third of all the production jobs in the United States were held by high school dropouts. As late as 1973, in fact, education and employment were only loosely related. In that era, students with or without high school diplomas, particularly males, could get fairly decent jobs in the manufacturing economy and in our state in the agricultural economy. Widely available blue-collar jobs paid attractive wages and benefits, supported families, bought new cars fairly regularly, and put the children of working men and women through college. In many instances these children were the first generation in their families to attend college. Those days—and jobs –are now gone in North Carolina. Indeed those types of jobs are no longer available in our country. According to the National Commission on the High School Senior Year, the proportion of professional jobs in our country is about the same as it was twenty years ago, but the proportion of skilled jobs has nearly tripled. Most significantly, the proportion of unskilled jobs has fallen drastically. These conditions of modern life demand that all students graduate from a rigorous academic program that equips them with the knowledge and skills needed to succeed in both postsecondary education and careers. Over the past 10 years, in North Carolina 40% of students who have completed a vocational education sequence have indicated that taking vocational education courses has been the main reason for their remaining in school.

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[1] Darity, Jr., William et al. *Increasing Opportunity to Learn via Access to Rigorous Courses and Program: One Strategy for Closing the Achievement Gap for At-Risk and Ethnic Minority Students.* North Carolina Department of Public Instruction. May 2001.

The Department of Public Instruction and State Board of Education continue to work to ensure that all students meet rigorous academic standards and have the support mechanisms in place to allow them to be successful in meeting those standards.

# Senate Bill 1275

Section 2. (c) of Senate Bill 1275 states "The State Board of Education (Board) shall study the relationship between academic rigor and reducing the school dropout rate. As part of this study, the Board shall include the following:

(1) The development of a proposal to accelerate the learning of students able to complete high school in three years.
(2) The elimination of low level classes at the middle and high school levels;
(3) The examination of the appropriateness of electives and exploratory courses at the middle school level;
(4) A review of current vocational courses to determine the rigor of the content; and
(5) The development of up-to-date standards for vocational/technical teachers."

The Curriculum and School Reform Services Area of the Department of Public Instruction will use the following strategies to develop a comprehensive report for items (1), (2) and (3) listed above. This report will be presented to the State Board of Education for discussion on May 7, 2003 and for action in June, 2003. Following Board action, the report will be forwarded to the Joint Legislative Oversight Committee.

**(1). The development of a proposal to accelerate the learning of students able to complete high school in three years.**

**Strategies:**

a. Survey other states to determine what they are doing to help very capable students to complete high school in time periods other than the traditional four year cycle such as three or five years.

b. Review findings and recommendations from "The Lost Opportunity of Senior Year: Finding a Better Way", the report of the National Commission on the High School Senior Year published in January 2001.

c. Review a variety of data from the North Carolina Community College system. This data will include the following:
- Concurrent enrollment
- Huskins enrollment
- High school age students obtaining a GED
- High school age students attending adult high school

d. Review Governor's Easley Education First Taskforce's recommendations that deal specifically with reducing the drop out rate in our state's schools.

e. Examine research available on exemplary high school programs such as the Southern Regional Education Board's (SREB) High Schools that Work program.

f. Research the financial implications of early graduation from high school

g. Review a variety of data from the University of North Carolina system such as the graduation rate for the past five years and remediation needed by entering freshmen for the past five years.

h. Review findings of such exemplary high school and college transitional programs as the middle college program. Investigate local examples of these programs such as the one in Guilford County.

# Senate Bill 1275

## Section 2. ( c)

**(2) The elimination of low-level classes at the middle and high school levels**

**Strategies:**

a. Review Southern Regional Education Board's data on rigor in middle level course offerings in their consortium states.

b. Review research on the effectiveness of transition programs for ninth graders such as Ninth Grade Academies on increasing the readiness of students for more rigorous high school course work.

c. Review trend data for the following:
- Enrollment in nationally recognized honors programs such as Advanced Placement and International Baccaluareate
- Enrollment and graduation rates in each of our state's high school diploma courses of study: career, college technical preparation and university preparation.
- Enrollment of students in locally developed honors level courses.

d. Review research and recommendations of the following task forces or committees: "North Carolina Advisory Commission on Raising Achievement and Closing Gaps", "Middle Grades Taskforce," and "Increasing Opportunity to Learn via Access to Rigorour Courses and Programs: One Strategy for Closing the Achievement Gap for At-Risk and Ethnic Minority Students."

e. Survey teacher regarding their knowledge and use of differentiated instruction. Include in the survey summary information about such programs as Gaston County's innovative efforts to adjust the time a student spends in a high school course to accommodate student's different learning styles.
- Review the data from Exceptional Children Division's Algebra I project
- Review enrollment figures for Algebra I, Algebra IA and Algebra IB.

f. Review data on the impact of local options for the identification of Academically or Intellectually Gifted students on the elimination of low-level classes.

# Senate Bill 1275

## Section 2. ( c)

**(3) The examination of the appropriateness of electives and exploratory courses at the middle school level**

**Strategies:**

a. Review data on the course taking patterns of middle school students in the following reports or projects:

"Where do North Carolina's Middle Schools stand in the 21st Century? A Status Report on Programs and Practices"

Southern Regional Education Board's "Education's Weak Link: Student Performance in the Middle Grades" and "Raising the Bar in the Middle Grades: Readiness for Success",

"Schools to Watch Program"

b. Review the number of electives and exploratory courses that schools list on such reports as the Student Activity Report.

c. Conduct focus groups with middle level students on their course taking patterns with special emphasis on exploratory and elective courses

d. Research the impact of students working after school on dropouts.

e. Research the changing role of the school guidance counselor, the implementation of a school-wide guidance program and the impact of the state accountability program on the responsibilities and duties of the school guidance counselor.

f. Summarize current research on correlation of the following issues and drop outs:
   - Parent involvement
   - Behavior and Classroom Management

# Senate Bill 1275

## Section 2. ( c)

**(4) A review of current vocational courses to determine the rigor of the content**

Career and Technical Education
Standard Course of Study, revised January 2003

Agricultural Education

Business and Information
Technology Education

Career Development

Family and Consumer
Sciences Education

Health Occupations Education

Marketing Education

Middle Grades Education

Technology Education

Trade and Industrial Education

North Carolina

# Standard Course of Study
# GUIDE

Agricultural Education

Business and Information Technology Education

Career Development

Family and Consumer Sciences Education

Health Occupations Education

Marketing Education

Middle Grades Education

Technology Education

Trade and Industrial Education

Support Services
Special Populations
Career Development Coordination


**January 2003**

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# FOREWORD

This document has been prepared to assist local school systems in planning effective and comprehensive career-technical education programs. It contains information about planning, required resources, instructional guidelines, and program area offerings.

This document reflects the need for local school systems to have flexibility to accommodate varying local patterns of organization, resources, and needs. It has been prepared with input from over 170 business/industry representatives, 424 local school administrators, and approximately 3,100 teachers. We appreciate their invaluable input and suggestions.

We believe that this document will have a positive influence on thousands of North Carolina students who take career-technical courses. As a result, the economic development of our State will also be enhanced.

June S. Atkinson, Director
Division of Instructional Services

# PREFACE

The *North Carolina Standard Course of Study Guide* is to be used to plan career-technical education programs beginning with the 2004-05 school year.

Part I provides a program description for career-technical education programs. Subparts include information related to planning, resources, work-based learning, other delivery approaches, and local course options.

Part II highlights specific planning information for each career-technical program area. The content is outlined by program descriptions, major program objectives, scope and sequence, and course descriptions.

Part III describes special population services. This section has a program description, objectives, description of eligible target groups, definitions of disabling conditions, service delivery strategies, and enrollment guidelines. This section also includes Career Development Coordination.

Some local situations may require other modifications. When these occur, a modification procedure has been developed and is included in the appendices. Career-technical student organizations (CTSOs) are also described in the appendices.

# CAREER-TECHNICAL EDUCATION
# STANDARD COURSE OF STUDY GUIDE
# TABLE OF CONTENTS

Activities and procedures within Career-Technical Education are governed by the philosophy of simple fairness to all. Therefore, the policy of the Division is that all operations will be performed without regard to race, sex, color, national origin, or handicap.

# Career-Technical Education Course Offerings
# Grades 6-12

| Program Areas | Grades 6-8 | High School Levels | | | |
|---|---|---|---|---|---|
| | | Level 1 | Level 2 | Level 3 | Level 4 |
| Agricultural Education | Exploring Biotechnology | Agriscience Applications | Agricultural Mechanics I<br>Agricultural Production I<br>Animal Science I<br>Equine Science I<br>Biotechnology and Agriscience Research I<br>Environmental and Natural Resources I<br>Horticulture I | Agricultural Mechanics II<br>Agricultural Mechanics II - Small Engines<br>Agricultural Production II<br>Animal Science II<br>Animal Science II - Small Animal<br>Equine Science II<br>Biotechnology and Agriscience Research II<br>Environmental and Natural Resources II<br>Horticulture II<br>Horticulture II - Turf Grass<br>Horticulture II- Landscape Construction | Agricultural Advanced Studies |
| Business and Information Technology Education | Business Computer Technology<br>Exploring Business Technologies<br>Keyboarding | Computer Applications I<br>Foundations of Information Technology<br>Digital Communication Systems<br>Principles of Business and Personal Finance | Business and Electronic Communications<br>Computer Applications II<br>Computerized Accounting I<br>Computer Programming I | Business Law<br>Computerized Accounting II<br>e-Commerce I<br>Computer Programming II<br>Networking I | Business Advanced Studies<br>Business Management & Applications<br>e-Commerce II<br>Network Administration II – Linux<br>Network Administration II – Microsoft<br>Network Administation II– Novell<br>Small Business/ Entrepreneurship |
| Career Development | Exploring Career Decisions | Career Management | | | |

Note: Work-based learning methods such as internships, cooperative education, and apprenticeships may be a part of any course in grades 9-12.

# Career-Technical Education Course Offerings
# Grades 6-12

| Program Areas | Grades 6-8 | High School Levels | | | |
|---|---|---|---|---|---|
| | | Level 1 | Level 2 | Level 3 | Level 4 |
| Family and Consumer Sciences Education | Exploring Life Skills | Teen Living | Housing and Interiors I | Life Management<br>Housing and Interiors II | Family and Consumer Sciences Adv. Studies |
| | | Foods I- Fundamentals | Foods II- Advanced | Foods II- Food Science | |
| | | | | Culinary Arts and Hospitality I | Culinary Arts and Hospitality II |
| | | | Apparel Development I | Apparel Development II | |
| | | Parenting and Child Development | | Early Childhood Education I | Early Childhood Education II |
| Health Occupations Education | Exploring Biotechnology | Health Team Relations<br>Biomedical Technology | Allied Health Sciences I<br>Medical Sciences I | Allied Health Sciences II<br>Medical Sciences II | Health Sciences Adv. Studies |
| Marketing Education | Exploring Business Technologies | Principles of Business and Personal Finance | Marketing<br>Fashion Merchandising | Travel, Tourism, and Recreation Marketing<br>Marketing Management<br>Small Business/ Entrepreneurship | Marketing Advanced Studies<br>Marketing Technology and Media<br>Strategic Marketing |
| | | | Sports and Entertainment Marketing I | Sports and Entertainment Marketing II | |
| Technology Education | Exploring Technology Systems | Fundamentals of Technology | Communication Systems<br>Manufacturing Systems<br>Structural Systems<br>Transportation Systems | | Technology Advanced Studies |
| | | | Principles of Technology I | Principles of Technology II | |
| | | | Scientific and Technical Visualization I | Scientific and Technical Visualization II | |

Note: Work-based learning methods such as internships, cooperative education, and apprenticeships may be a part of any course in grades 9-12.

# Career-Technical Education Course Offerings
# Grades 6-12

| Program Areas | High School Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Trade and Industrial Education | Introduction to Trade & Industrial Education | | | Trade and Industrial Education Advanced Studies |
| | | | Trade & Industrial Cooperative Training I | Trade & Industrial Cooperative Training II |
| | | Commercial and Artistic Production Technologies | | |
| | | Digital Media I | Digital Media II | |
| | | Printings Graphics I | Printing Graphics II | |
| | | Construction Technologies | | |
| | | Construction Technology I | Construction Technology II | Construction Technology III |
| | | Electrical Trades I | Electrical Trades II | |
| | | Furniture and Cabinetmaking I | Furniture and Cabinetmaking II | |
| | | Masonry I | Masonry II | Masonry III |
| | | Engineering Technologies | | |
| | | Computer Engineering Technology I | Computer Engineering Technology II | |
| | | Drafting I | Drafting II – Architectural | Drafting III – Architectural |
| | | | Drafting II – Engineering | Drafting III – Engineering |
| | | Electronics I | Electronics II | |
| | | Networking I | Network Engineering Technology II – Cisco | Network Engineering Technology III – Cisco |
| | | | Network Engineering Technology II – Nortel | Network Engineering Technology III – Nortel |
| | | | Scientific & Technical Visualization I | Scientific & Technical Visualization II |
| | | Industrial Technologies | | |
| | | Metals Manufacturing Technology I | Metals Manufacturing Technology II | |
| | | Welding I | Welding II | |
| | | Public Service Technologies | | |
| | | Cosmetology Introduction | Cosmetology I | Cosmetology II |
| | | Transport Systems Technologies | | |
| | | Automotive Service Technology I | Automotive Service Technology II | Automotive Service Technology III |
| | | Collision Repair Technology I | Collision Repair Technology II | |

Note: Work-based learning methods such as internships, cooperative education, and apprenticeships may be a part of any course in grades 9-12.

# Part I
# Career-Technical Education In North Carolina

## PLANNING FOR CAREER-TECHNICAL EDUCATION

**MISSION AND PURPOSE**

The mission of career-technical education (CTE) is to help empower students for effective participation in an international economy as world-class workers and citizens.

Career-technical education fulfills this mission by:

1. Preparing students for postsecondary education in career-technical education and lifelong learning.
2. Preparing students for initial and continued employment.
3. Assisting students in making educational and career decisions.
4. Applying and reinforcing related learning from other disciplines.
5. Assisting students in developing decision-making, communication, problem-solving, leadership, and citizenship skills.
6. Preparing students to make informed consumer decisions and apply practical life skills.
7. Making appropriate provisions for students with special needs to succeed in career-technical education programs.

**PROGRAM AREAS**

Competency-based courses are offered in eight program areas, with each area having school-based, work-based, or community-based learning opportunities.

1. Agricultural Education
2. Business and Information Technology Education
3. Career Development
4. Family and Consumer Sciences Education
5. Health Occupations Education
6. Marketing Education
7. Technology Education
8. Trade and Industrial Education

Combined with other academic offerings, career-technical education assists all enrollees with career goals and high school graduation requirements. Students are to have a career development plan outlining courses to be taken to meet a tentative career objective and obtain a high school diploma.

**COMMON GOALS***

All programs in career-technical education are designed to contribute to the broad educational achievement of students. These programs contribute to students being able to

**COMMON GOALS* (continued)**

1. Identify, organize, plan, and allocate resources – time, money, materials and facilities, and human resources.
2. Work with others by participating as a team member, serving clients/customers, negotiating, and working with diversity.
3. Acquire and use information.
4. Work with and operate effectively within social organizations and technological systems.
5. Work with a variety of technologies.
6. Contribute to the development of reading, writing, listening, speaking, and mathematical skills.
7. Contribute to the development of thinking creatively, making decisions, solving problems, and reasoning.

* These goals are based on the Secretary's Commission on Achieving Necessary Skills (SCANS) Report.

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**STATE BOARD OF EDUCATION RESPONSIBILITIES**

The State Board of Education is responsible for providing direction and leadership to career-technical education. The State Board of Education's guidelines are outlined in the *ABCs of Public Education, Basic Education Program,* and the *Master Plan for Career-Technical Education.*

The ABCs has three major emphases:

1. Accountability: Schools are held accountable for student progress. The teachers and principal at each school are responsible for how well they teach children.
2. Basics: Schools are to focus on the care of a good, solid education: reading, writing, and mathematics.
3. Control: Individual schools are given maximum flexibility to decide where to channel their efforts and their resources to achieve success.

The *Basic Education Program* for North Carolina's Public Schools outlines the curriculum which should be provided in all schools throughout the state. Career-technical education is one of the curriculum areas included.

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**MASTER PLAN**

The *Master Plan for Career-Technical Education* establishes the philosophy and framework of the State Board of Education for career-technical education. The framework of the State Board of Education includes the following:

1. Courses should be available to students without regard to race, sex, national origin, or handicap.
2. Teaching transferable and thinking skills is important in preparing students to adapt to a changing work environment.
3. Instruction should provide opportunities for students to apply communication, computational, scientific, and other academic skills to specific areas.

**MASTER PLAN (continued)**

4. Input from local advisory committees, employment data, community surveys, student surveys, and student follow-up are necessary in planning, implementing, and evaluating local programs.
5. Students are provided opportunities to earn industry credentials or certifications documenting specific competencies achieved through participation in a career-technical education program.
6. Counselors and teachers should coordinate programs with business and industry to ensure that educational objectives match work requirements. Additionally, work experiences achieved through shadowing, internships, cooperative on-the-job training, or apprenticeships ensure an easy transition from a student to a competent, wage earner.
7. All students in career-technical programs have an opportunity to develop and extend their learnings through participation in active career-technical student organizations. The program of work for each organization should be based on instructional competencies and be an integral part of the program.
8. Strong career development, guidance, counseling, job placement, and follow-up services are to be available to assist students in planning for their careers and enrolling in appropriate courses. All students should have tentative career development plans.
9. Parents are to be actively involved in helping their children choose courses.
10. Full cooperation, communication, and coordination between secondary schools and community colleges are necessary for each student advancing to a higher education level.

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**CAREER-TECHNICAL STUDENT ORGANIZATIONS (CTSO)**

A career-technical student organization (CTSO) is an integral part of each program area's curriculum. The CTSOs are

Career Exploration Clubs of North Carolina (CECNC)
for Middle Grades Students

DECA
for Marketing Education

Future Business Leaders of America (FBLA)
for Business and Information Technology Education

FFA
for Agricultural Education

Family, Career and Community Leaders of America (FCCLA)
for Family and Consumer Sciences Education

Health Occupations Students of America (HOSA)
for Health Occupations Education

Technology Student Association (TSA)
for Technology Education

SkillsUSA
for Trade and Industrial Education

Any student enrolled in a career-technical course is eligible for membership in the career-technical student organization associated with that program.

**(CTSO) (continued)**

CTSOs develop character, citizenship, technical, leadership, and teamwork skills essential for students who are preparing for the workforce and further education. They enhance students' civic awareness and provide opportunities for developing social competencies and a wholesome attitude about living and working.

CTSOs provide a unique instructional method for attaining the competency goals and objectives identified in each course. Their activities are considered a part of the instructional day when they are directly related to the competencies and objectives in the course blueprints.

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**DETERMINING PROGRAM OFFERINGS**

Career-technical education planners determine local program offerings by considering the following:

1. Availability of resources.
2. Changes in population characteristics.
3. Labor needs in new and emerging occupations, including small business ownership.
4. Labor needs in existing occupations and career pathways with greater than average anticipated growth.
5. Rates of increase in employment projected for the service sector of the public and private economy.
6. Projected increase in occupations requiring technical skills.
7. Impact of technology on consumer decision making.
8. Impact of managing personal, family, and work lives.
9. Community college offerings.
10. Availability of technology.
11. Student and employment demand in career pathways.

When determining local program offerings for a school or a total school system, local planning personnel should organize a comprehensive and appropriate sequence of career-technical education offerings for students enrolled in grades 6-12. These offerings should be based on an assessment of student needs, interests, aspirations and labor market demands, and projections.

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**EVALUATING PROGRAM ACCOMPLISHMENTS**

Consistently high quality local programs can be ensured through a system of continuing qualitative and quantitative evaluation and reporting of programs, services, and activities. The State Board of Education has the primary responsibility for statewide evaluation of career-technical education programs.

Local program evaluation is based on State Board of Education's adopted performance measures and standards. These measures include: academic and technical attainment, credentials, placement and follow-up, and nontraditional enrollment and completion. All enrollees, including members of special populations, are assessed by

these measures and standards at the local level. Annually, local school systems must determine if these standards are met, or if substantial progress is being made to meet the standards. Local evaluations are disaggregated by courses, programs, sites, gender, and special population categories.

**STUDENT ACHIEVEMENT AND PROGRESS**

Reports of enrollment, student and employer follow-up, and performance measures and standards constitute data bases for local program planners and state staff. Other sources include labor market, demographic, teacher, student, and program data. These data sets should be used in making programmatic decisions, for program review and improvement, for guidance, and as a basis for marketing career-technical education to internal and external audiences.

Student achievement and progress may be evaluated by using criterion-referenced measures such as:

- Written and oral pre- and post-assessments.
- Performance tests with teacher or employer rating checklists.
- Performance gains.
- Observation of performance in class and on-the-job settings by teachers and job supervisors.
- Evaluation of projects and products completed by the student, using checklists and rating scales.
- Follow-up studies with students and employers.

Testing instruments and procedures may be designed locally or obtained from another source. Sources include the computerized competency/ test-item banks available from Career-Technical Education, North Carolina Department of Public Instruction. This resource is a part of VoCATS -- the Career-Technical Education Instructional Management System.

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## PARTNERSHIPS WITH COMMUNITY AND TECHNICAL COLLEGES

**COORDINATION**

Coordinating secondary and community and technical college programs is important in helping students make a smooth transition from one level of instruction to another without their experiencing delays or loss of credit. Articulation models include time-shortened, advanced skills, and technical preparation associate degree programs.

**TIME-SHORTENED PROGRAMS**

Time-shortened programs eliminate unnecessary redundancy in educational experiences. They grant advanced placement to high school students entering a postsecondary program. As a result, students complete an occupational specialty or associate degree more quickly than a normal postsecondary program would allow.

**ADVANCED SKILLS PROGRAMS**

Advanced skills programs streamline educational experiences for grades 11-14 in order to incorporate more advanced training than a traditional program would provide. It allows students who have mastered academic or technical skills in high school to bypass some introductory postsecondary courses, thus allowing more time for advanced skills courses.

**COLLEGE TECH PREP**

A college tech prep program is a sequential course of study designed to meet the need for graduates to have more technically-oriented educational preparation. Through a blending of higher level academic and career-technical courses, college tech prep prepares students for increasingly sophisticated technical occupations. It combines English, mathematics, science, career-technical course sequences, and other graduation requirements.

College tech prep combines secondary and postsecondary programs that:

- Provide technical preparation in at least one field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, health, or business.
- Build student competence in mathematics, science, and communications (including applied academics) through a sequential course of study.
- Lead to placement in employment.

Any model should have:

- Leadership and commitment from top administrators.
- Early faculty involvement.
- Written articulation agreements.
- Open and frequent communications.
- Clearly defined responsibilities and goals.
- Clearly identifiable courses of study.
- Competency-based curriculum.
- Common focus on mutual goals.
- Integration of academic and career-technical education.
- Curriculum alignment.
- Career and development counseling.
- Assessment and evaluation.
- Parental involvement.
- Work-based learning.

## RESOURCES

### PERSONNEL

Local boards of education are responsible for securing the persons best qualified for their career-technical education programs. CTE staff include teachers, administration and support personnel such as career development, special populations, and VoCATS coordinators. Selection must be subject to licensure standards approved by the State Board of Education.

Additional information related to licensure may be obtained by referring to the licensure guidelines available from the Division of Human Resource Management.

### TEACHER RESPONSIBILITIES

Career-technical teachers should have the personal qualities, professional preparation, appropriate license, and work experience to carry out their teaching responsibilities effectively. The number and variety of course offerings determine the number of career-technical teachers needed in a school. Single teacher staffing can and will limit the number of courses offered. A sequence which extends from introductory study to specialized occupational areas usually requires multiple staffing.

The major duties of career-technical education teachers include:

- Preparing and implementing instructional plans.
- Working with business/industry representatives.
- Evaluating student progress.
- Implementing career-technical student organizations (CTSOs) leadership and instructional activities in and out of the classroom.
- Organizing and maintaining tools, equipment, and the facility.

An increasing number of teachers also have responsibility for using work-based learning activities such as the cooperative on-the-job training, internships, apprenticeships, and supervision of school-based enterprises.

Sponsoring CTSOs requires planning meetings, both at the local and regional levels, which may occur in the evening or on weekends. One lead advisor should be appointed to coordinate CTSO activities and responsibilities for each program area.

Each of these major categories requires adequate time for preparation, often prior to school and after regular instructional time. Additional time should be provided if the teacher maintains laboratory equipment or coordinates work-based learning. Teachers should have adequate time for instructional preparation.

### PROFESSIONAL DEVELOPMENT

A school system should have a professional development program which assures that:

**PROFESSIONAL DEVELOPMENT (continued)**

1. Activities are provided in accordance with identified professional, skill area, and individual growth and development needs of personnel.
2. An assessment has been conducted to identify staff development needs of career-technical education personnel.
3. The selection of in-service topics and activities is based on identified needs within the instructional program.
4. Teachers and other concerned personnel are informed regarding staff development opportunities available within and outside the local administrative unit, including colleges, universities, businesses and postsecondary institutions.
5. Teachers and other personnel are made aware of the components in the school system's staff development plan.
6. In-service activities offer practical methods to improve instruction and expedite job responsibilities.
7. Within reason, inservice activities are readily available and conveniently scheduled for participants.
8. Teacher and support staff are provided opportunities to participate in at least one annual staff development activity related to their teaching assignments and/or areas of licensure.

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**FACILITIES**

Success of career-technical programs is dependent on adequate and well-equipped facilities which stay current with the business, industry, and other employment categories they represent. To assure successful learning, the physical facilities for each program should meet the following requirements:

1. Size and space for each program is adequate to accommodate the number of students enrolled.
2. Space is arranged for maximum flexibility and ease in teacher supervision of multiple activities.
3. Permanent furnishings and equipment are adequate in number and in good operating condition.
4. There is adequate provision for maintaining service systems in good working condition (e.g., electricity, water, light control).
5. Classrooms, laboratories, auxiliary areas (finish rooms, storage), and other facilities are adequate in design, suitability, and quantity to enable students to meet the specified objectives.
6. Each teacher is assigned a conveniently located, furnished, and equipped area for planning, record keeping, consultation, and administration.
7. All facilities meet the requirements of the Environmental Protection Agency (www.epa.gov) and Occupational Safety and Health Act (www.osha.gov).
8. Restrooms and dressing rooms are located to provide convenient access to students of either sex.
9. Facilities have been modified to accommodate handicapped students.

**FACILITIES (continued)**

10. Adequate provisions exist for the safety and health of students and teachers.

*For further information about facilities, refer to the Career-Technical Education Facilities Planner, (http://www.schoolclearinghouse.org/pubs/facguid.pdf)*

**EQUIPMENT, MATERIALS, AND SUPPLIES**

Students differ widely in interests, abilities, background, learning styles, and prerequisite knowledge and skills. The variations which exist in students make it equally important that a wide range of current and bias-free instructional materials be made available to students.

If students are to get the most out of occupational and practical life skills, they must have the opportunity to practice the tasks involved. This means that a quantity of consumable supplies must be available to students for practice and demonstration activities.

Rapid changes in technology require a regular updating of tools, equipment, and even raw materials. The school system must respond to modern technological advances by maintaining an on-going schedule for updating all tools, equipment, and materials used by students in laboratory activities. In general, the school system should plan to have the following available for each program:

1. Basic equipment and instructional aids in adequate quantity, quality, and currency to permit appropriate practice in laboratory instruction.
2. A budget that permits adding, replacing, and updating equipment and materials.
3. A budget that permits consumable supplies (such as food, lumber, ingredients for mortar, etc.) to be made available in sufficient quantities and at appropriate times.
4. Currently-adopted textbooks (or their equivalent) and pertinent supplementary books readily available in adequate supply and in usable condition.
5. A variety of bias-free instructional materials that can accommodate a great diversity of student interests.

Also, the school system should make sure that all tools and equipment are kept repaired and in good working order. Adequate instructional support and resource materials should be available at each teaching station or easily obtained from the media center or other central location.

*For further information about specific equipment, refer to the Equipment Standards for Career-Technical Education.*
(NCPublicSchools.org/workforce_development/publications/equipment_standards/index.html)

## FUNDING

Career-technical education programs are funded through a combination of state, federal, and local resources. The State Board of Education is committed to a funding formula which provides state funds for the support of a statewide secondary program. Federal career-technical education funds allocated to local boards of education are to be spent according to federal criteria and purposes.

Local boards of education receive state/federal funds on the basis of a continuing plan and an annual application for career-technical education. This plan is to be developed with the advice of local advisory committees and is to be consistent with criteria set up by legislation and State Board of Education policy. The career-technical monies may be used to:

1. Employ CTE instructional and supportive personnel.
2. Purchase CTE instructional materials, supplies, and equipment.
3. Conduct certain other activities which contribute to the state and local goals/objectives of the career-technical program and which are consistent with criteria for their use.

State and federal career-technical funds made available are to be used to supplement the amount of local funds that would, in the absence of career-technical funds, be made available for career-technical education and in no case supplant funds.

All career-technical education courses identified in the course descriptions sections of this document are eligible for career-technical funding when offered in an approved scope and sequence and according to the guidelines in the *Career-Technical Education Fiscal and Policy Guide.* (www.NCPublicSchools.org/workforce_development/management/index.html)

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## CURRICULUM PLANNING

It is critical to the success of a program's implementation/expansion that planning precede student enrollment. This planning time is to be used by administrative personnel to:

1. Conduct student interest, community, and employment surveys to determine if there is a need for the program.
2. Review industry credentials, where available.
3. Select an advisory committee composed of business, industry, and lay community representatives who jointly collaborate with educators in the decision-making process.
4. Assess whether the program will contribute to graduation requirements specified by the State Board of Education adopted in June 2000. (e.g. contribution to a career pathway.)
5. Select a licensed teacher who can begin contributing to the organizational operation of the program.

**CURRICULUM PLANNING (continued)**

6. Design and organize classroom/laboratory facilities and obtain equipment, supplies, books, and materials.
7. Assure that local administrators and other school personnel understand and support the total program.
8. Interpret the program to students and the school community.

Course blueprints, with competencies and objectives, and test-item banks, serve as guides for planning and evaluating instruction. Available from CTE state office, these materials help teachers identify and assess student achievement.

In addition, teachers may need time to develop on-the-job skills and the knowledge required for teaching the course.

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**ENROLLMENT**

Enrollment in each class is to be of a size that ensures effective instruction as prescribed in the individual course descriptions in Part II of this *North Carolina Standard Course of Study Guide.*

Recommended maximum student enrollment is established to maintain proper instructional management and to assure a safe and healthful teaching/learning environment. Maximum figures are suggested for each course of instruction based on the:

1. Degree to which student safety is involved in the learning process.
2. Desired level of learning outcomes for students in the course.
3. Type of instructional activities involved.
4. Type, quantity, and size of instructional equipment, materials, and supplies.
5. Amount of space needed by students and teachers for instructional purposes.

Factors influencing the number of students for any particular course should take into consideration availability of shops and laboratories, availability of qualified instructors, adequacy of preparation time, cooperative on-the-job placement, internship arrangements, number of classroom work stations, and class scheduling requirements.

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**INSTRUCTIONAL ORGANIZATION AND CONTENT**

Course offerings within each program area are both competency-based and individualized. Teachers within a program should cooperatively develop a single, comprehensive instructional plan for each course and program in the school and in the school system. Teachers are also responsible for evaluating competencies established for the program. Where appropriate, discussions about gender equity should be incorporated into the curriculum.

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## WORK-BASED LEARNING

**OVERVIEW**

Work-based learning strategies allow schools to go beyond the classroom and into the community to develop student competence. An essential component of any work-based learning is connecting the work-place to school-based learning. See www.NCPublicSchools.org for State Board of Education policies governing work-based learning.

**APPRENTICESHIP**

*Apprenticeship* is one of the oldest methods of job training. High school apprenticeship is an industry-driven education and career training program based on recognized industry standards. It is a means by which employers address current and projected employment needs. This program is a partnership among business, industry, education, North Carolina Department of Labor (DOL), parents and youth apprentices. Some apprenticeship characteristics are

- Use of a skilled journeyman to help instruct the apprentice.
- Combination of classroom-related instruction with structured work-based learning.
- Employment by an employer who has a direct need for trainees in the occupation.
- Incremental pay scale that increases with skill and knowledge development.
- Training of a highly skilled technician or craft person.
- Appropriate for occupations that do not require a college degree but require a high level of skill and knowledge.
- Registration by the North Carolina Department of Labor, Apprenticeship and Training Division. The Division provides free assistance to the employer and to the apprentice and certifies both the training program and the newly trained journeyman.
- Application of high school apprenticeship hours and experience toward an adult apprenticeship leading to a completed journeyman certificate.
- On-the-job training for each year of participation during high school. The high school student can begin when he/she turns 16 years of age and is part of the high school apprenticeship program. For additional information, refer to North Carolina State Board of Education Policies for work-based learning methods receiving academic credit.

**COOPERATIVE EDUCATION**

*Cooperative career-technical education* provides on-the-job training for students through a cooperative agreement among the school, the employer, the parents/guardian, and the student. A cooperative education coordinator is responsible for providing classroom instruction related to the occupation in which the student is placed and for contact with the student and the appropriate supervisor at the training site. Written training agreements and written training plans between the school and the employers are cooperatively developed and available. Such agreements include:

**COOPERATIVE EDUCATION (continued)**

- Provisions for the employment of student workers in conformity with federal, state, and local laws and regulations and in a manner not resulting in exploitation of such student workers for private gain.
- Related occupational instruction in school.
- Payment of the prevailing wage for employment to student workers and awarding school credit for on-the-job training.

In the classroom, students should receive instruction related to their on-the-job training experiences. A training plan jointly developed by the teacher-coordinator and employer outlines the sequential classroom instruction and on-the-job training a student receives. The training plan is the base for evaluating the student's progress, on the job, and in the classroom. Each cooperative student is coordinated and supervised by a teacher coordinator.

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**INTERNSHIP**

*Internships* allow for additional development of career-technical competencies. Internships are an essential way for today's youth to experience the value of work, develop pride in work, and mature personally. Many communities have opportunities for students to intern in an industry or to work with some community organization addressing a particular problem or need of the business/industry sector.

*Internships* allow students to observe and participate in daily operations, develop direct contact with job personnel, ask questions about particular careers, and perform certain job tasks. This activity is exploratory and allows the student to get hands on experience in a number of related activities.

Possibilities are limited only by the imagination of the students, the staff, and the employment community. The teacher, student, and the business community jointly plan the organization, implementation, and evaluation of an internship, regardless of whether it is an unpaid or paid internship.

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**SCHOOL-BASED ENTERPRISES**

*A school-based enterprise* engages students in providing services or the production of goods for sale through a school sponsored activity. Individual or sequenced high school courses are set up as actual student-run businesses. Participants learn entrepreneurship, application of skills and knowledge from other courses, and enhance their personal development.

Production work activities are also school-based and are performed by career-technical classes under contract with a second party for remuneration. These activities (e.g., live projects) have always been a vital part of the career-technical education delivery system and are among the most effective instructional methods for developing student competence.

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**JOB SHADOWING**

*Job shadowing* is an unpaid short term activity that exposes the student to the workplace. The student is allowed to observe an experienced skilled worker in an actual work setting. Job shadowing heightens student understanding of potential career opportunities and depicts a clear connection between the classroom and the workplace. The duration of this activity could be a half day or longer depending on the needs of the student and work place.

**SERVICE LEARNING**

*Service learning* is a method by which students learn and develop through active participation in thoughtfully organized service and community service experiences. This method provides students with opportunities to use newly acquired skills and knowledge in real-life situations in their own communities.

## OTHER DELIVERY APPROACHES

**CAREER ACADEMIES**

*Career academies* are designed to integrate academic and career-technical curricula organized around a theme (health careers, electronics, banking, etc.) They encompass a set of jobs ranging from those that require no postsecondary education to those that require advanced degrees. Academies have the following common characteristics:

- Each academy is organized as a "school within a school" where students take a sequence of courses together.
- Each academy has a particular career, occupational or industrial theme.
- Each academy enlists the active involvement in the related sector of local employers.

Local employers are involved in the development and implementation of the curriculum. Employers may also provide equipment, serve as mentors and offer summer work experiences.

**CONTRACTS AND AGREEMENTS**

Where conditions are not feasible to establish a regular in-school career-technical program, the following alternatives are available:

- Establish a contract or agreement with a private industry, business, training agency, or community/technical college.
- Employ temporary, part-time, hourly personnel for short-term instructional needs.

All contracts, agreements, and part-time or hourly personnel must meet the procedures outlined in the *Career-Technical Education Fiscal and Policy Guide. (www.dpi.state.nc.us/workforce_development/management/index.html)*

## LOCAL COURSE OPTIONS

Career-technical education courses may be offered in grades 6-12. Course descriptions are given in Part II.

A local education agency may request authorization for offering a course not listed on the course offerings chart by following the procedures outlined in Appendix B. ***This request must be prepared only once when courses are offered in a school system for the first time.***

The following criteria should be used to help a local education agency determine whether to offer a specialized course.

1. The new course will satisfy a currently unfilled community need.
2. The new course is desired by local community and business leaders.
3. The career potential of this new course is permanent and not transitory or temporary in nature and is of sufficient size to assure employment opportunities to students.
4. The course offers attractive career and wage benefits to potential concentrators.
5. A qualified instructor is available.
6. Facilities, equipment, and appropriate instructional materials are available.
7. A curriculum framework is or can be developed which includes:
   - Competency and objective listing (blueprint) verified by business and industry.
   - Content outline.
   - Postassessment.

# PART II
# Specific Planning Information For Each Program Area

# AGRICULTURAL EDUCATION

**PROGRAM DESCRIPTION**

Today, many definitions exist for the term "agriculture." In its vision, agricultural education in North Carolina employs the phrase "food, fiber and environmental systems" to describe a very broad field, best defined by the National Research Council as, "A field that encompasses the production of agricultural commodities, including food, fiber, wood products, horticulture crops, and other plant and animal products. The terms also include financing, processing, marketing and distribution of agricultural products; farm production supply and service industries; health, nutrition and food consumption; the use and conservation of land and water resources; development and maintenance of recreational resources; and related economic, sociological, political, environmental and cultural characteristics of the food and fiber system." This new phrase was chosen in an effort to be inclusive of and to harness the potential of the total agricultural community. ***With this in mind, the mission of the agricultural education program is to prepare students for success in the food, fiber and environmental systems.***

Agricultural Education provides students with the opportunity to participate in an integrated educational model that focuses students on careers in the food, fiber and environmental systems. The program is designed to develop technical, leadership and management expertise needed by secondary school students for success in the industry.

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**DESIGN**

The agricultural education program is built on the three core areas of classroom/laboratory instruction, supervised agricultural experience programs and FFA student organization activities/opportunities. The program is designed for delivery through these three components as follows:

- Classroom/Laboratory Instruction – quality instruction in and about agriculture that utilizes a "learning by doing" philosophy.
- Supervised Agricultural Experience Programs – all students are expected to have an agriculturally related work-based learning experience while enrolled in agricultural education courses.
- FFA Student Organization activities/opportunities – FFA activities are an integral part of the agricultural education program that all agricultural education students should participate in if they are to fully benefit from their enrollment in the program.

A quality agricultural education program has a balanced utilization of these three core components. These components are best carried out when the following strategies are employed:

- Community-Based Planning – involvement of the school administration and community in the planning and coordination of the program is essential to success.

- Professional Development – agriculture teachers take advantage of opportunities for professional development and growth.
- Partnerships – the development of alliances with community and business leaders are essential for program success.
- Marketing – every agricultural education program needs a successful marketing strategy in place to attract and retain students and the support of the community that is being served.

When these components and strategies are in place, program success will occur.

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**MAJOR PROGRAM OUTCOMES**

The major program outcomes for students enrolled in an agricultural education program are as follows:

1. Opportunity to explore career options available in agriculturally-related fields to assist them in planning for a future career.
2. Technical skills training for success in an agriculturally-related career.
3. Connectivity of school-based instruction with work-based learning.
4. Leadership and personal development training needed to succeed in an agriculturally-related career including teamwork, problem-solving, and communications.
5. Competitive advantage for students to succeed in an international economy.
6. Commitment to community development and service through projects that require interaction with parents, agribusiness leaders, civic organizations, etc.
7. Development of skills necessary for lifelong learning in agriculture leading to career advancement and success.

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**PROGRAM UNIQUENESS**

The agricultural education program includes program offerings for students in grades 7-12. Students may choose to enter and progress through one of several agricultural education career pathways in order to achieve their career major within the program. The determination of offerings should be based on an assessment that includes a combination of student needs/interests, program enrollment, qualified teaching faculty, industry needs, and community interest/resources.

Exploring Biotechnology may be offered in grades 7-8 as a part of a middle grade career-technical education program. Agriscience Applications is a recommended entry level course for students enrolled in grades 9 through 12. Agricultural Advanced Studies is offered to agricultural education students in their senior year as a course option to demonstrate their ability to use content and apply knowledge to a real-world situation in a career major.

**COURSE OFFERINGS** Agricultural Education course offerings, grades 7-12, are the following:

| Grades 7-8 | Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Exploring Biotechnology | Agriscience Applications | | | Agricultural Advanced Studies |
| | | Agricultural Mechanics I | Agricultural Mechanics II | |
| | | | Agricultural Mechanics II- Small Engines | |
| | | Agricultural Production I | Agricultural Production II | |
| | | Animal Science I | Animal Science II | |
| | | | Animal Science II - Small Animal | |
| | | Equine Science I | Equine Science II | |
| | | Biotechnology and Agriscience Research I | Biotechnology and Agriscience Research II | |
| | | Environmental and Natural Resources I | Environmental and Natural Resources II | |
| | | Horticulture I | Horticulture II | |
| | | | Horticulture II - Turf Grass | |
| | | | Horticulture II - Landscape Construction | |

*Note: Work-based learning methods such as internships, cooperative education, and apprenticeships may be a part of any course in grades 9-12.

# Agricultural Education Course Descriptions

**Agriscience Applications**
Course Number: 6810
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course focuses on integrating biological/physical sciences with technology as related to the environment, natural resources, food production, science and agribusiness. Topics of instruction include agricultural awareness and literacy, leadership and FFA, employability skills and introduction to all aspects of the total agricultural industry. Skills in biology, language, writing, computers, math, and physics are reinforced in this course. Work-based learning strategies appropriate for this course are: field trips, shadowing, agriscience projects, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Agricultural Advanced Studies**
Course Number: 6899
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This is a three-phased exit course for seniors that is career-focused in agricultural education. The three components of the program include a research paper, a product, and a presentation. Students demonstrate their ability to use content and apply knowledge to real-world situations in a career major. In addition, they will also demonstrate their ability to write, speak, apply knowledge, problem-solve, and use life skills such as time management, planning, follow-through, and organization. Students work under the guidance of a teacher-facilitator in collaboration with community members, business representatives and other school-based personnel. FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Three technical credits in Agricultural Education.

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**Agricultural Mechanics I**

Course Number:
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course develops knowledge and technical skills in the broad field of agricultural machinery, equipment, and structures. The primary purpose of this course is to prepare students to handle the day-to-day problems, accidents, and repair needs they will encounter in their chosen agricultural career. Topics include agricultural mechanics safety, agricultural engineering career opportunities, hand/power tool use and selection, electrical wiring, basic metal working, basic agricultural construction skills related to plumbing, concrete, carpentry, basic welding, and leadership development. Skills in physics, geometry, and algebra are reinforced in this course. Work-based learning strategies appropriate for this course are agriscience projects, field trips, shadowing, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Agricultural Mechanics II**

Course Number:
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course expands upon the knowledge and skills learned in Agricultural Mechanics I. The topics of instruction emphasized are non-metallic agricultural fabrication techniques, metal fabrication technology, safe tool and equipment use, human resource development, hot/cold metal working skills and technology, advanced welding and metal cutting skills, working with plastics, and advanced career exploration/decision-making. Skills in physics, geometry, and algebra are reinforced in this course. Work-based learning strategies appropriate for this course are agriscience projects, internships, cooperative education, apprenticeship, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Agricultural Mechanics I

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**Agricultural Mechanics II-Small Engines**

Course Number:
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

Small Engine Technology provides hands-on instruction and emphasizes small engine systems including the compression, fuel, electrical, cooling and lubrication systems. Troubleshooting methods are emphasized. In addition, students learn how to select engines for specific applications. Materials will be covered to prepare students for the Master Service Technician Exam. Safety skills will be emphasized as well as leadership development and work-based learning. Opportunities exist for students to conduct internships or apprenticeships as small engine technicians.

Prerequisite: Agricultural Mechanics I

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**Agricultural Production I**

Course Number: 6811
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course focuses on the basic scientific principles and processes related to the production of plants and animals for the food and fiber systems. Topics of instruction include basic understanding of the livestock/poultry industry and its various components, career opportunities, soil science, crop science/agronomy, weed science, basic agricultural machinery and related industry careers, environmental stewardship, and leadership/personal development. Skills in algebra and biology are reinforced in this course. Work-based learning strategies appropriate for this course are agriscience projects, internships, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Agricultural Production II**

Course Number: 6812
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course provides instruction that expands the scientific knowledge and technical skills gained in Agricultural Production I with heavy emphasis on topics including pesticide use and safety, herbicide use and safety, wildlife habitat concerns, irrigation, agricultural equipment technology and safety, global industry issues, career planning, and human resource development. Skills in algebra and biology are reinforced in this course. Work-based learning strategies appropriate for this course are agriscience projects, supervised agricultural experience, and apprenticeship. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Agricultural Production I

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**Animal Science I**

Course Number: 6821
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course focuses on the basic scientific principles and processes that are involved in animal physiology, breeding, nutrition, and care in preparation for an animal science career major. Topics include animal diseases, introduction to animal science, animal nutrition, animal science issues, career opportunities, and animal evaluation. Skills in biology, chemistry, and algebra are reinforced in this course. Work-based learning strategies appropriate for this course are agriscience projects, internships, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Animal Science II**

Course Number: 6822
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course includes more advanced scientific computations and communication skills that were developed in Animal Science I. Topics include animal waste management, animal science economics, decision making, global concerns in the industry, genetics, and breeding. Content knowledge in biology, chemistry, and algebra are reinforced in this class. Work-based learning strategies appropriate for this course are agriscience projects, internships, cooperative education, apprenticeships and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Animal Science I

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**Animal Science II-Small Animal**

Course Number:
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

The Small Animal course provides instruction on topics related to animal husbandry related to small animals as those served by a veterinarian. Content related to the breeding, grooming, care and marketing of animals that fit into this category will be covered through this course. Opportunities for students to gain hands-on experience will be included in the course and reinforced through work-based learning and leadership experiences.

Prerequisite: Animal Science I

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**Biotechnology and Agriscience Research I**

Course Number:
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

Biotechnology in Agriculture provides instruction in the technologically advanced world of agriculture and life sciences. Students are exposed to the latest techniques and advances in plant and animal biotechnology with a strong emphasis on hands-on activities. The FFA student organization and work-based learning experiences are integrated throughout this course to bring the scientific information to students for real-life application. Agriscience Applications is a recommended prerequisite.

Prerequisite: None

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**Biotechnology and Agriscience Research II**

Course Number: 6872
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course provides instruction in laboratory and safety skills needed by agricultural research scientists. Current applications of biotechnology in animal science, environmental science, food science and plant science are emphasized. Basic concepts of genetics and microbiology are applied to the agriculture industry and its success in providing food and fiber for the world. Opportunities exist for students to conduct individual or team research experiments. Hands-on laboratories and current topic discussions provide students an understanding of careers in agriscience research.

Prerequisite: Biotechnology and Agriscience Research I

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**Environmental and Natural Resources I**

Course Number: 6851
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course provides an introduction to environmental studies, which includes topics of instruction in renewable and non-renewable natural resources, history of the environment, personal development, water and air quality, waste management, land use regulations, soils, meteorology, fisheries, forestry, and wildlife habitat. Skills in biology and algebra are reinforced in this class. Work-based learning strategies appropriate for this course are agriscience projects, field trips, shadowing, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Environmental and Natural Resources II**

Course Number: 6852
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course covers instruction in best management practices in methods of environmental monitoring and conservation, air and water regulations, sampling methodologies, prescribing conservation techniques, and wildlife and forestry management. Skills in biology, chemistry, and algebra are reinforced in this class. Work-based learning strategies appropriate for this course are agriscience projects, field trips, shadowing, cooperative education, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Environmental and Natural Resources

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**Equine Science I**

Course Number:
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

Equine Science I focuses on the basic scientific principles and processes related to equine physiology, breeding, nutrition and care in preparation for a career in the equine industry. Skills in biology, chemistry and math are reinforced in this course. Opportunities for students to gain hands-on experience will be included in this course through work-based learning and leadership experiences. Supervised agricultural experience programs and FFA leadership activities are integral components of the course.

Prerequisite: None

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**Equine Science II**

Course Number:
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

The course focuses on more advanced applications of feeding, breeding, and management practices involved in the horse industry. Content knowledge in biology, chemistry, and algebra are reinforced in this class. Work-based learning strategies appropriate for this course are agriscience projects, internships, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Equine Science I

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**Exploring Biotechnology**

Course Number: 6828
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course focuses on the agricultural and medical industries with emphasis on the relationship of science and technology that affects agriculture, medicine and health care. Topics include career concepts in the agriculture and medical fields. Skills in mathematics, science and language arts are reinforced in the course. This course contributes to the development of a career development plan. Work-based learning activities appropriate for this course are projects, field trips, and job shadowing. Teaching strategies encourage the development of essential skills and knowledge of the world of work, careers and leadership in the agriculture and medical industries. FFA leadership activities apply instructional competencies to authentic experiences.

Prerequisite: None

**Horticulture I**

Course Number: 6841
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course provides instruction on the broad field of horticulture with emphasis on the scientific and technical knowledge for a career in horticulture. Topics in this course include plant growth and development, plant nutrition, media selection, basic plant identification, pest management, chemical disposal, customer relations, career opportunities, and leadership development. Skills in biology, chemistry, and algebra are reinforced in this course. Work-based learning strategies appropriate for this course are agriscience projects, internships, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Horticulture II**

Course Number: 6842
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course covers instruction that expands the scientific knowledge and skills to include more advanced scientific computations, and communication skills needed in the horticulture industry. Topics include greenhouse plant production and management, bedding plant production, watering systems, light effects, basic landscape design, installation and maintenance, lawn and turfgrass management, career planning, and leadership/personal development. Skills in biology, chemistry, and algebra are reinforced in this class. Work-based learning strategies appropriate for this course are agriscience projects, cooperative education, apprenticeships, and supervised agricultural experience. Supervised agricultural experience programs and FFA leadership activities are integral components of the course and provide many opportunities for practical application of instructional competencies.

Prerequisite: Horticulture I

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**Horticulture II-Landscape Construction**

Course Number: 6882
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

Landscape Construction provides hands-on instruction and emphasizes safety skills needed by landscape technicians in the field. This course is based on the North Carolina Landscape Contractor's Association skill standards for a Certified Landscape Technician. Students are instructed in interpreting landscape designs, identifying landscape plants, and planting/maintaining trees, shrubs and turf. Landscape construction is emphasized in the areas of grading and drainage, irrigation, paver installation and the use/maintenance of landscape equipment. Current topic discussions provide students an understanding of careers and the employability skills needed to enter the landscape industry. Opportunities exist for students to conduct internships or apprenticeships as landscape technicians.

Prerequisite: Horticulture I

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**Horticulture II-Turf Grass**

Course Number:
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

Turf Grass provides hands on instruction and emphasizes eight units of instruction including: fundamentals of soils and pests; environmental issues related to turf management; landscape basics; lawn care and turf production; golf course management; sports turf and turf irrigation; turf equipment and maintenance; and human resources and financial management. Safety skills will be emphasized as well as leadership development and work-based learning. Opportunities exist for students to conduct internships or apprenticeships related to landscaping, lawn care, and golf course management.

**Prerequisite** Horticulture I or Agricultural Production I

**LOCAL COURSE OPTIONS**

Schools may offer one or more specialized courses not included in the Standard Course of Study. These courses should meet a local economic need. Options may include:

Aquaculture
Floriculture

Refer to Part I, Local Course Options, and Appendix B for instructions on how to offer these courses.

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**FOR MORE INFORMATION**

Agricultural Education
North Carolina State University
Department of Agricultural and Extension Education
Ricks Hall Box 7607
Raleigh, NC 27695-7607
(919) 515-4206

or

NC Department of Public Education
Instructional Services/ITHS
Agricultural Education
Career - Technical Education
6360 Mail Service Center
Raleigh, NC 27699-6360

# BUSINESS AND INFORMATION TECHNOLOGY EDUCATION

**PROGRAM DESCRIPTION**

Business and Information Technology Education is a broad, comprehensive curriculum at the middle and high school levels that provides students with meaningful instruction for and about business. Instruction in Business and Information Technology Education encompasses business skills and techniques, an understanding of basic economics, and business attitudes essential to participate in the multinational marketplace as productive workers and consumers.

The public schools of North Carolina have a responsibility to provide a competent, business-literate, and skilled workforce. Business and Information Technology Education is critical to this process! Business and Information Technology Education is for every student because it is designed to integrate business and information technology skills into the middle and high school curriculum. Therefore, a Business and Information Technology Education course should be part of the curriculum for every student. Business and Information Technology Education has relevance and helps young adults manage their own financial affairs and make intelligent consumer and business-related choices.

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**DESIGN**

Business and Information Technology Education is designed to prepare graduates as viable competitors in the business world and for advanced educational opportunities. The instructional program begins in the middle grades with the development of proficiency in operating a computer keyboard using the touch system and using basic computer software applications. Exploratory experiences in the Business Technologies Career Pathway leading to career decisions concludes the middle school curriculum. This experience continues at the high school level with career majors that provide knowledge/skill development in:

- Accounting and Finance
- Business Administration
- Business Management and Small Business/Entrepreneurship
- Information Technology
- Office Systems Technology

The basic skills of reading, writing, and computation are an integral part of the business and information technology program. Computer literacy and proficiency in the various applications are emphasized. Development of human relations/interpersonal, employability, economic, and entrepreneurial skills is a part of each of the career majors. Opportunities to develop and apply leadership, social, civic, and business-related skills are provided through Future Business Leaders of America

(FBLA), the Career-Technical Student Organization for business and information technology education students. Integration of the entire business program with appropriate academic concepts/courses is strongly encouraged.

**MAJOR PROGRAM OUTCOMES**

Business and Information Technology Education prepares students for successful transition from school to work. It empowers them to use business principles and concepts while they manage their current and future responsibilities as informed consumers and productive workers. Upon completion of a Business and Information Technology Education career major, students should be able to do the following:

- Function as economically literate citizens in domestic and multinational settings.
- Develop an understanding of personal, societal, and governmental responsibility in the economic system.
- Understand how businesses operate.
- Demonstrate the interpersonal, teamwork, and leadership skills needed to function in diverse business and information technology settings.
- Develop an awareness of career opportunities and lifelong learning skills that enable students to become employable in a variety of business and information technology careers.
- Select and apply technology tools for making personal and business decisions.
- Communicate effectively as writers, listeners, and speakers in diverse social and business settings.
- Understand how accounting procedures can be applied to decisions about planning, organizing, and allocating personnel and financial resources.
- Understand principles of law and ethics as they apply to personal and business settings.
- Appreciate the value of entrepreneurial spirit, both in small business and the corporate environments.
- Understand that the various functions of a business are not separate, but are interrelated, and that each impacts the others.
- Apply critical thinking skills needed to function in students' multiple roles as citizens, consumers, workers, managers, business owners, and directors of their own economic futures.

**NATIONAL VOLUNTARY SKILL STANDARDS**

Sponsored by the United States Department of Education, the *Career Clusters in Information Technology (IT)* initiative is a partnership of Education Development Center, Inc. (EDC), the Information Technology Association of America (ITAA), and the National Alliance of Business (NAB). The goal of this initiative was to create a national model and career curricular framework for IT careers that involve the design, development, support, and management of hardware, software, multimedia, and systems integration services. North Carolina was one

of the initial pilot sites for this project. This model and framework supports the development of curriculum in the *Business and Information Technology Education Standard Course of Study*.

A second national Career Cluster initiative has been used in the development of curriculum in the *Business and Information Technology Education Standard Course of Study*. The *Business, Management, and Administration Career Cluster Project* was a partnership involving states, schools, educators, employers, industry groups, and other stakeholders that created curiculum guidelines, academic and technical standards, assessments, and professional develoment materials for career concentrations in Business, Management, and Administration. North Carolina was one of the initial state sites involved in this effort.

**NATIONAL CURRICULUM STANDARDS**

The National Business Education Association developed the second edition of the *National Standards for Business Education* (2001) to ensure that students and adults are afforded equal access to fundamental business knowledge and skills and, therefore, an equal opportunity to success in life. The standards, first published in 1995, represent the leading edge of business and career education. The *National Standards for Business Education* are based on a comprehensive curriculum model that integrates 11 content areas: accounting, business law, career development, communication, computation, economics and personal finance, entrepreneurship, information technology, international business, management, and marketing.

**STUDENT CREDENTIALING AND CERTIFICATION**

Most businesses focus on skills acquired through course work and work-based learning experiences when deciding if prospective employees can perform in their workplace. Building a portfolio as students progress through the Business and Information Technology Education courses is one way to show the skills they can use effectively.

Students desiring a universally recognized credential that is information-technology related should enroll in a career major that leads them to credentials such as Internet and Computing Core Certification ($IC^3$), Microsoft Officer User Specialist (MOUS), A+ Certification, Net+, Certified Novell Administrator (CNA), Microsoft Certified Systems Engineer (MCSE), or Certified Cisco Network Administrator (CCNA). These high school credentials can be enhanced at postsecondary levels or may be used immediately in the workplace.

**PROGRAM UNIQUENESS**

Data input and manipulation skills are essential to success in all business occupations. These skills are essential if students are to interact with technology in the most effective manner.

Each course in a Business Technologies Pathway requires the use of technology. For students to succeed in these courses, they must have keying skills and basic computer skills that allow them to perform at acceptable levels.

Local education agencies are encouraged to have students demonstrate competence in basic keying and technology usage. Through an assessment that focuses on speed, accuracy, formatting, and proper techniques, business educators can determine the level of competence in keyboarding and basic technology usage. By administering selected timed writings and formatting assessments to all students in middle/junior high, teachers can counsel students into proper courses in high school.

Keyboarding and Business Computer Technology are designed to develop keying and formatting skills, appropriate techniques, and basic technology applications. Keyboarding and Business Computer Technology should not be the sole provider of computer skill exposure in the middle grades. A combination of Keyboarding and Business Computer Technology is designed to reinforce and complement the computer skills being integrated throughout the elementary and middle grades curriculum.

The Business Technologies Career Pathway majors are designed broadly with foundational skills at levels 1 and 2. As the students progress into levels 3 and 4, they begin to specialize into a career major. These career majors are designed to allow the students to articulate into the postsecondary programs to gain the appropriate degree of specialized training they desire.

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**COURSE OFFERINGS***

Business and Information Technology Education course offerings, grades 6-12, are the following:

| Grades 6-8 | Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Business Computer Technology<br><br>Exploring Business Technologies<br><br>Keyboarding | Computer Applications I<br><br>Foundations of Information Technology<br><br>Digital Communication Systems<br><br>Principles of Business and Personal Finance | Business and Electronic Communications<br><br>Computer Applications II<br><br>Computerized Accounting I<br><br>Computer Programming I | Business Law<br><br>Computerized Accounting II<br><br>e-Commerce I<br><br>Computer Programming II<br><br>Networking I | Business Advanced Studies<br><br>Business Management & Applications<br><br>e-Commerce II<br><br>Network Administration II – Linux<br><br>Network Administration II – Microsoft<br><br>Network Administation II – Novell<br><br>Small Business/ Entrepreneurship |

*Note: Work-based learning methods such as internships, cooperative education, and apprenticships may be a part of any course in grades 9-12.

# Business and Information Technology Education
# Course Descriptions

**Business Computer Technology**

Course Number: 6400
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 67-90

This course is designed to provide hands-on instruction in basic computer hardware components and software applications. Emphasis is placed on extending and reinforcing touch keying skills while providing experience for learning word processing, database, spreadsheet, graphics, multimedia, and telecommunications applications. Communication skills and basic mathematical concepts are reinforced in this course. Work-based learning strategies appropriate for this course are field trips and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Keyboarding

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**Business and Electronic Communications**

Course Number: 6535
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course provides students essential competencies for oral and written communication in the technological workplace. Emphasis is placed on utilizing the computer to further develop written communication skills such as composing memos, letters, and reports; describing processes or mechanisms; and completing forms and responding to e-mail. Utilizing technology (presentation software and telecommunications) to further develop oral communication skills such as delivering oral presentations, giving instructions, interviewing for information, and presenting information/reports in an effective manner is reinforced in this course. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Keyboarding Skill – defined as a minimum of 35 words per minute with errors corrected; format from rough draft copy of an announcement, memorandum, personal business letter, and unbound report; and exhibit proper keyboarding techniques.

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**Business Advanced Studies**

Course Number: 6599
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This is a culminating course for seniors who are career focused in Accounting and Finance, Business Administration, Business Management and Ownership, Information Technology, or Office Systems Technology in the business technologies pathway. The three parts of the course include writing a research paper, producing a product, and delivering a presentation. Students demonstrate their abilities to use content and apply knowledge to professional business situations in a selected career. In addition, they will also demonstrate their ability to write, speak, apply knowledge, problem solve, and use life skills such as time management and organization. Students work under the guidance of a teacher-advisor in collaboration with community members, business representatives, and other school-based personnel.

Prerequisite: The student must have competed three technical credits in the Business Technology Pathway.

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**Business Law**

Course Number: 6215
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course is designed to acquaint students with the basic legal principles common to business and personal activities. Topics include consumer concepts to assist students when evaluating contracts, purchasing with credit, purchasing appropriate insurance, and renting and owning real estate. Business concepts such as contracting, ethics, starting a business, hiring employees, managing employees, and representing other businesses and individuals in an agency capacity are included. Skills in critical thinking are reinforced in this course along with oral and written communication skills. Work-based learning strategies appropriate for this course are field trips and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**Business Management and Applications**

Course Number: 6225
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course covers the organizational functions of businesses including quality concepts, project management, and problem solving. Emphasis is placed on analyzing the social, technological, and organizational systems in businesses, such as human relations, communications, data management, and meeting and conference coordination. Skills in communications and mathematics are reinforced as the student uses the appropriate business technology to perform business applications. Work-based learning strategies appropriate to this course are school-based enterprises, internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: The student must have completed two technical credits in Business and Information Technology Education.

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**Computerized Accounting I**

Course Number: 6311
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course is designed to help students understand the basic principles of the accounting cycle. Emphasis is placed on the analysis and recording of business transactions; preparation and interpretation of financial statements; accounting systems; banking and payroll activities; basic types of business ownership; and an accounting career orientation. Mathematics skills and critical thinking are reinforced. Work-based learning strategies appropriate to this course are school-based enterprises, internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**Computerized Accounting II**

Course Number: 6312
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course is designed to provide students with an opportunity to develop in-depth knowledge of accounting procedures and techniques utilized in solving business problems and making financial decisions. Emphasis includes partnership accounting; adjustments and inventory control systems; budgetary control systems; cost accounting; and further enhancement of accounting skills. Mathematics skills and critical thinking are reinforced. Work-based learning strategies appropriate to this course are school-based enterprises, internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Computerized Accounting I

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**Computer Applications I**

Course Number: 6411
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course is designed to help students master advanced skills in the areas of word processing, database management, spreadsheet, telecommunications, desktop publishing, and presentation applications. Emphasis is on data communications, Internet and e-mail, as well as skill development in the integration of software applications, ethical issues pertaining to information systems, and information technologies careers. Communication skills and critical thinking are reinforced through software applications. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Keyboarding Skill – defined as a minimum of 35 words per minute with errors corrected; format from rough draft copy of an announcement, memorandum, personal business letter, and unbound report; and exhibit proper keyboarding techniques.

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**Computer Applications II**

Course Number: 6412
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course is designed to help students master advanced skills in the areas of integrating technology devices, Internet research strategies and uses, complex desktop publishing, multimedia production, and basic web page design. Emphasis is placed on skill development and refinement of skills in information technologies as well as economic, ethical, and social issues in the information technologies area. Communication skills and critical thinking are reinforced through software applications. Work-based learning strategies appropriate for this course are school-based enterprises, internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Computer Applications I

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**Computer Programming I**

Course Number: ____
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction 135-180

This course is designed to introduce the concepts of programming, application development, and writing software solutions in the Visual Basic environment. Emphasis is placed on the software development process, principles of user interface design, and the writing of a complete Visual Basic program including event-driven input, logical decision making and processing, and useful output. Communication, critical thinking, and lifelong learning skills are reinforced through the completion of course activities. Work-based learning strategies appropriate to this course are internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Algebra I

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**Computer Programming II**

Course Number: ____
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This project-based course is designed to teach students to access and manipulate data in a variety of data structures including Access, Structured Query Language (SQL), XML, and text files. Emphasis is placed on advanced functionality, packaging and deploying business solutions, and program life-cycle revision and maintenance. Communication, critical thinking, and lifelong learning skills are reinforced through the completion of course activities. Work-based learning strategies appropriate for this course are internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Computer Programming I

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**Digital Communication Systems**

Course Number: ____
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course is designed to teach basic digital input skills including keying using the touch method, speech recognition, and use of handheld devices. Emphasis is on the daily use and operation of commonly used digital communication devices to develop skill with concentrated application of those skills in the production of business communication and correspondence. Communication skills are reinforced as the students format, compose, and proofread. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**e-Commerce I**

Course Number: ____
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course is designed to help students master skills in the design and construction of complex web sites for conducting business electronically. Emphasis is on skill development in advanced web page construction and entrepreneurial applications of conducting business electronically as well as economic, social, legal, and ethical issues related to electronic business. Students will plan, design, create, publish, maintain, and promote an electronic business website. Communication skills and critical thinking are reinforced through software applications. Work-based learning strategies appropriate for this course are school-based enterprises, internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Computer Applications II

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**e-Commerce II**

Course Number: ____
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course is designed to help students master advanced skills in electronic commerce security; payment infrastructure; secure electronic commerce transactions; and electronic commerce order entry, tracking and fulfillment. Emphasis is placed on marketing techniques for electronic commerce websites, tracking and using customer and sales data, and other uses of databases in electronic commerce sites. Communication skills, problem solving, research, and critical thinking skills are reinforced as students develop and enhance capstone projects. Work-based learning strategies appropriate to this course are internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: e-Commerce I

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**Exploring Business Technologies**

Course Number: 6208
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course is designed to explore the nature of business in an international economy and to study related careers in fields such as entrepreneurship, financial services, information technology, marketing, office systems technology, public relations and promotion, and travel and tourism. Emphasis is on using the computer while studying applications in these careers along with problem solving and thinking skills. Communication and mathematics skills are reinforced as students explore business applications and careers. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies. This course contributes to the development of a career development plan.

Prerequisite: None

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**Foundations of Information Technology**

Course Number: ____
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course provides students with the essential competencies to pursue further study in information technology. Emphasis is on the career concentrations of network systems, information support and services, programming and software development, and interactive media. Students will study new and emerging developments in information technology basics, applications, and systems, while enhancing technical skills, academic foundations, communication, leadership, teamwork, ethics, and legal responsibilities. Communication skills, problem solving, research, and critical thinking are reinforced in this course. Work-based learning strategies appropriate to this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**Keyboarding**

Course Number: 6511
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 67-90

This course is designed to teach middle grades students basic keying skills, which consist of fluent manipulation of letter, figure/symbol, and basic service keys by touch. Emphasis is on daily use of a computer system and appropriate software to provide integrated training through a learn/practice/sustain/assess plan of skill building. Communication skills are reinforced as students format, compose, and proofread. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**Networking I**

Course Number: ____
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course provides a broad-based foundation in the engineering and administration of computer network systems. Emphasis is on PC/network hardware and operating systems, architecture, protocols, design and security, and career development. Communication, mathematical, and critical thinking skills are strengthened throughout the course. Work-based learning strategies appropriate for this course are field trips and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

**Network Administration II**

Course Numbers:
Linux ____
Microsoft ____
Novell ____
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course is the second of two courses of a certification program based on industry-validated skill standards. Topics of this course include networking security, administrator responsibilities, and documentation of work-based experiences. Critical thinking skills are taught. The expectation of this course sequence is for students to sit for the appropriate industry credentialling exam. Work-based learning strategies appropriate to this course are internships, cooperative education, and apprenticeship. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Networking I

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**Principles of Business and Personal Finance**

Course Number: 6200
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course introduces students to the rewards and risks of owning or operating a business enterprise. Emphasis is placed on the mastery of skills needed to plan, organize, manage, and finance a small business. Skills in communication, technical writing, mathematics, research, and problem-solving are reinforced as each student prepares his/her own business plan. Work-based learning strategies appropriate for this course include cooperative education and paid/unpaid internships. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**Small Business/ Entrepreneurship**

Course Number: 6235
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction 135-180

This course introduces students to the rewards and risks of owning or operating a business enterprise. Emphasis is placed on the mastery of skills needed to plan, organize, manage, and finance a small business. Skills in communication, technical writing, mathematics, research, and problem-solving are reinforced as each student prepares his/her own business plan. Work-based learning strategies appropriate for this course include cooperative education and paid/unpaid internships. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: The student must have completed two technical credits in the same career pathway.

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**LOCAL COURSE OPTIONS**

Schools may offer one or more specialized courses not included in the *Standard Course of Study.* These courses should meet a local economic need. Options may include:

Data Base Programming and Administration
International Business

Refer to Part I, Local Course Options, and Appendix B for instructions on how to offer these courses.

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**PARTNERING OPPORTUNITIES**

The following are external, nationally recognized programs. The participants must be members of schools of these organizations and follow the curriculum requirements of these partnerships. NCDPI will not provide any curriculum materials for these programs.

- Advanced Placement (AP) Computer Science
- International Baccalaureate (IB) Business Management
- International Baccalaureate (IB) Information Technology
- National Academy Foundation (NAF) Academy of Finance
- National Academy Foundation (NAF) Academy of Informa tion Technology

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**FOR MORE INFORMATION**

NC Department of Public Instruction
Instructional Services/B&M
Business and Information Technology Education
Career - Technical Education
6358 Mail Service Center
Raleigh, NC 27699-6358

# CAREER DEVELOPMENT

**PROGRAM DESCRIPTION**

Career development is a process that involves students, parents, teachers, counselors, and the community. The goal is to help students make good decisions about themselves and their future. The process includes helping students develop and implement an individual career development plan. Coordinating the process is the responsibility of the Career Development Coordinator.

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The Career Development program area provides both instructional courses and career services to students enrolled in Career-Technical Education courses.

**DESIGN**

Instructional Courses:

The two instructional courses include Exploring Career Decisions (6-8) and Career Management (9-12). Both courses include competencies in leadership development, critical and creative thinking, decision-making, problem-solving, teamwork and technology, as well as opportunities for the application of skills. The courses are based on the National Career Development Guidelines and focus on the North Carolina identified career pathways.

Students enrolled in Exploring Career Decisions also have opportunities to enhance their skills by participating in Career Exploration Clubs of North Carolina (CECNC).

Career Development Services:

Career Development Coordinators provide leadership and support activities in three broad areas

- Academic Development
- Career Development
- Personal/Social Development

Within these areas, functions include

- Preparatory services
- Case management services
- Transition services
- Business, industry, and education partnership services
- Promotional services

School-wide and group activities are provided with a focus on career-technical education students. In addition, concentrators in Career-Technical Education may be served for a period of one year after graduation.

**MAJOR PROGRAM OUTCOMES**

The career development curriculum is designed to help students understand the lifelong, sequential process of determining self and career identity. Students will have opportunities to learn how to make good decisions about education, work, and life roles; how to secure employment; and how to succeed in a rapidly changing world of work. The Career Management Curriculum will enable students in grades nine through twelve to:

- Analyze the influence of a positive self-concept.
- Apply positive interaction skills.
- Evaluate the impact of growth and development.
- Analyze the relationship between educational achievement and career planning.
- Analyze the need for positive attitudes toward work and learning.
- Apply skills to locate, evaluate, and interpret career information.
- Apply skills to prepare to seek, obtain, maintain, and change jobs.
- Determine how societal needs and functions influence the nature and structure of work.
- Apply problem solving skills to make decisions.
- Consider the interrelationship of life roles as related to career planning.
- Appraise the continuous changes in male/female roles as related to career planning.
- Apply skills in personal career planning.

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**NATIONAL STANDARDS**

Curriculum development and service functions are based on the National Career Development Guidelines, endorsed by the North Carolina State Board of Education. Other national standards that influence this program area include the National Standards for School Counseling Programs. One-third of the North Carolina Comprehensive School Counseling program is focused on career development competencies.

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**PROGRAM UNIQUENESS**

Career development is a process in which skills are acquired, applied, and transferred from one activity or job to another throughout the life span. Continuous learning and up-dating will be required. Knowing the career planning process will assure that our citizens know how to obtain and use quality career information.

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**COURSE OFFERINGS**

Career Development Course offerings, grades 6-12 are the following:

| Grades 6-8 | Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Exploring Career Decisions | Career Management | | | |

# CAREER DEVELOPMENT EDUCATION
## Course Descriptions

**Exploring Career Decisions**

Course Number 6158
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course is designed to provide an orientation to the world of work. Experiences are designed to introduce students to the technical nature of today's world and the role of productive workers. Activities enable students to increase self-awareness and make wise educational and occupational decisions as they plan for careers. Work-based learning strategies appropriate for this course include job shadowing and field trips. Opportunities for leadership development and further application of instructional competencies are provided through Career Exploration Clubs of North Carolina (CECNC). The formal career development planning process often begins within this course.

Prerequisite: None

**Career Management**

Course Number 6145
Recommended Maximum Enrollment: 26
Recommended Hours Of Instruction: 135-180

This course is designed to prepare students to locate, secure, keep, and change careers. Competencies for this course are based on the National Career Development Guidelines. Strategies for this course include teamwork, technology, problem-solving, decision-making, goal-setting, and self-management.

**Prerequisite**: None

**FOR MORE INFORMATION**

NC Department of Public Instruction
Instructional Services/BHC
Career Development
Career - Technical Education
6359 Mail Service Center
Raleigh, NC 27699-6359

# FAMILY AND CONSUMER SCIENCES EDUCATION

**PROGRAM DESCRIPTION**

Family and Consumer Sciences Education prepares students for careers working with individuals and families, as well as for competence in the work of their own families. The concept of work, whether in a family or career, is central to the program area. The program's unique focus is on families, work, and their interrelationships. Family and Consumer Sciences Education prepares individuals for family and career.

**DESIGN**

Family and Consumer Sciences Education is founded on six distinct core areas. The areas are:

- Consumer Education and Resource Management
- Family and Interpersonal Relationships
- Foods, Nutrition, and Wellness
- Housing, Interiors, and Design
- Human Development and Parenting Education
- Textiles, Apparel, and Fashion

Developmentally appropriate courses incorporate these six core areas, as well as academic integration and workplace applications, to prepare students to successfully manage individual, family, work, and community roles. Examples of workplace applications include basic skills, thinking skills, and personal qualities. Ultimately, students prepare to enter paid employment and to advance within a career with additional training and/or education.

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**MAJOR PROGRAM OUTCOMES**

Family and Consumer Sciences Education prepares students for successful life management, employment, and career development. The overall program empowers students to:

1. Balance personal, home, family, and work lives.
2. Strengthen the well-being of individuals and families across the life span.
3. Become responsible citizens and leaders in family, community, and work settings.
4. Promote optimal nutrition and wellness across the life span.
5. Manage resources to meet the material needs of individuals and families.

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6. Use critical and creative thinking skills to address problems in diverse family, community, and work environments.

7. Prepare for successful life management, employment, and career development.

8. Function as providers and consumers of goods and services.

9. Appreciate human worth and accept responsibility for one's actions and success in family and work life.

## NATIONAL VOLUNTARY OCCUPATIONAL SKILL STANDARDS

The United States Departments of Education and Labor have initiated public-private partnerships to develop voluntary skill standards for various industries. They identified skills and performance levels needed by the American workforce to be competitive.

Family and Consumer Sciences Education links with the skill standards projects described below:

**Apparel and Textiles**

- The Uniform and Textile Service Association (UTSA) sets skill standards for production workers and maintenance technicians in the industrial laundry. These skills apply to the apparel and textiles career area.

**Community and Family Services**

- The Human Services Research Institute (HSRI) sets skill standards for the human services position of community support worker. These skills apply to Family and Consumer Sciences Advanced Studies.

**Culinary Arts and Hospitality**

- The Council of Hotel, Restaurant, and Institutional Education (CHRIE) sets skill standards for the food service positions of host, server, busser, and cashier/counter person in the hospitality and tourism industry. These skill standards apply to Culinary Arts and Hospitality I & II.

- The National Grocers Association (NGA) sets skill standards for customer service/stock associate and front-end associate. These skill standards apply to Culinary Arts and Hospitality I & II.

**Interior Design Services**

- The Foundation for Industrial Modernization (FIM) sets skill standards for computer aided drafting and design. These skill standards apply to Housing and Interiors I and II.

**STUDENT CREDENTIALING AND CERTIFICATION**

**North Carolina Early Childhood Credential**

Students who complete both levels of Early Childhood Education may be recognized as "teachers" in accordance with G.S. 110-91(8); 143 B-168.3. The Child Day Care Rules of North Carolina define "teacher" as the care giver who has responsibility for planning and implementing the daily program of activities for each group of children in a day care facility. These completers are entitled to the same benefits and are bound by the same requirements as other teachers in child care centers.

**ServSafe® Food Service Manager Certification**

Food Handling Certification is offered by county health departments, county extension offices and independent consultants. To receive the credential, students must satisfactorily complete the "ServSafe® Food Service Manager Certification" course developed and promoted by the National Restaurant Association. This is in addition to regular course work in Culinary Arts and Hospitality I and II and Foods II – Advanced.

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**PROGRAM UNIQUENESS**

Two areas in Family and Consumer Sciences Education have industry regulations. In both courses of study, compliance is recommended to meet public standards, therefore mitigating liability.

**Culinary Arts and Hospitality**

- The NC Department of Labor cites regulations on the use of equipment; and the NC Department of Environment, Health, and Natural Resources cites regulations regarding sanitation. These regulations assure the protection of public health. On an annual basis, food service establishments are inspected by county officials with the resulting sanitation grade posted. The establishments are issued grades of A, B, and C based on their compliance level.

**Early Childhood Education**

- The NC Department of Health and Human Resources, Division of Child Development, Regulatory Services, cites regulations related to child care and safety. Child care licensure is obtained by submitting an application for a license, passing inspections, and providing written operational plans and records. Licenses are renewed annually. A "one-star" rated license is required for operation. A center may also obtain a national accreditation from the National Association for the Education of Young Children.

Further, in all on-the-job work opportunities, students are bound by the same regulations as other employees, such as those regarding health certificates or immunizations. The Fair Labor Standards Act including Child Labor Law Requirements and the NC Wage and Hour Act also apply.

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**COURSE OFFERINGS***

Family and Consumer Sciences Education course offerings, grades 7-12, are the following:

| Grades 7-8 | Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Exploring Life Skills | Teen Living | | Life Management | Family and Consumer Sciences Adv. Studies |
| | | Housing and Interiors I | Housing and Interiors II | |
| | Foods I - Fundamentals | Foods II - Advanced | Foods II - Food Science | |
| | | | Culinary Arts and Hospitality I | Culinary Arts and Hospitality II |
| | | Apparel Development I | Apparel Development II | |
| | Parenting and Child Development | | Early Childhood Education I | Early Childhood Education II |

* Note: Work-based learning methods such as internships, cooperative education, and apprenticeships may be a part of any course in grades 9-12.

# Family and Consumer Sciences Education
# Course Descriptions

**Apparel Development I**

Course Number: 7035
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course examines clothing production in the areas of preparation for clothing construction, basic clothing construction techniques, consumer decisions, textiles, historical perspectives and design, and career opportunities. Emphasis is placed on students applying these construction and design skills to apparel and home fashion. Skills in art, communication, mathematics, science, and technology are reinforced in this course. Work-based learning strategies appropriate for this course include field trips, job shadowing, and services learning. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Apparel Development II**

Course Number: ____
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course focuses on advanced clothing and housing apparel development. The use of fibers and fabrics is combined with design and construction techniques to develop and produce a clothing or housing apparel product. A real or simulated business apparel enterprise and FCCLA activities allow students to apply instructional strategies and workplace readiness skills to an authentic experience and to develop a portfolio. Skills in science, math, management, communication, and teamwork are reinforced in this course. Work-based learning strategies approrpiate for the course include school-based enterprises, field trips, job shadowing, and service learning.

Prerequisite: Apparel Development I or Housing and Interiors I

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**Culinary Arts and Hospitality I**

Course Number: 7121
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 270-360

This is a two block course which introduces students to basic food production, management, and service activities in both the back and the front of the "house." Emphasis is placed on sanitation, safety, and basic food preparation. Skills in mathematics, science, and communication are reinforced in this course. Comprising 50 % of the course work, work-based learning strategies appropriate for this course include school-based enterprises, internships, cooperative education, and apprenticeship. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences. Foods I - Fundamentals is a recommended prerequisite for this course.

Prerequisite: None

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**Culinary Arts and Hospitality II**

Course Number: 7122
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 270-360

This is a two block course which provides advanced experiences in food production, management, and service. Topics include menu planning, business management, and guest relations. Skills in mathematics, communication, creative thinking, and entrepreneurship are reinforced in this course. Comprising 50 percent of the course work, work-based learning strategies appropriate for this course include school-based enterprises, internships, cooperative education, and apprenticeship. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: Culinary Arts and Hospitality I

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**Early Childhood Education I**

Course Number: 7111
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 270-360

Early Childhood Education I is a two block course that prepares students to work with children birth to age 8. Emphasis is placed on enhancing the development of young children while providing early education and care. Topics include stages of development, health, safety, guidance, and developmentally appropriate activities. This course is a two-credit course with work-based learning comprising over 50% of the required coursework. Students who will be participating in work-based learning experiences in child care centers should be 16 years of age prior to the beginning of the work-based placement (North Carolina Child Care General Statute 110.91, Section 8). The work-based learning strategies appropriate for this course include school-based enterprises, internships, cooperative education, service learning, field trips, job shadowing, and apprenticeships. SCAN (industry) skill development and FCCLA leadership activities provide the opportunity to apply instructional competencies and career management skills to authentic experiences. Parenting and Child Development is a recommended prerequisite for this course.

Prerequisite: None

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**Early Childhood Education II**

Course Number: 7112
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 270-360

Early Childhood Education II is a two block course that prepares students to work with children birth to twelve years of age in child care, preschool, and/or after school programs. Students are encouraged to continue their education at a community college or university. Students receive instruction in child care pertaining to teaching methods, career development, program planning and management, health and safety issues, entrepreneurship skills, and technology. This course is a two-credit course with work-based learning comprising over 50% of the required coursework. Students who successfully complete this course and are 18 years of age will be eligible to apply for the North Carolina Early Childhood Credential (NCECC) through the Division of Child Development. The work-based learning strategies appropriate for this course include school-based enterprises, internships, cooperative educa-

tion, field trips, job shadowing, and apprenticeships. SCAN (industry) skill development and FCCLA leadership activities provide the opportunity to apply instructional competencies and career management skills to authentic experiences.

Prerequisite: Early Childhood Education I

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**Exploring Life Skills**

Course Number: 7018
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course explores life skills essential for the adolescent now and in the future. Units include resource management, relationships, nutrition and wellness, child care, and career pathways. Resource management includes decision-making, interior design, and managing a sewing project. Relationships focus on personal and social responsibilities with emphasis on the family across the life span. The focus is on developing a foundation for the application of life management skills. Skills in applying basic academics, problem solving, decision making, and creative and critical thinking are reinforced in this course. This course also contributes to the development of the career development plan. Work-based learning strategies appropriate for this course include field trips, job shadowing, and service learning. Life skill development and FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Family and Consumer Sciences Advanced Studies**

Course Number: 7199
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This is a culminating course for seniors that is career-focused in the apparel design, community and family services, culinary arts and hospitality, early childhood education, food science, dietetics, and nutrition; or interior design career areas. The three parts of the course include a research paper, a product, and a presentation. Students demonstrate their abilities to use content and apply knowledge to authentic situations in a selected career. In addition, they will also demonstrate their abilities to write, speak, solve problems, and to use life skills such as time management and organization. Students work under the guidance of a teacher-facilitator in collaboration with community members, business representatives, and other school-based personnel. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: Three technical credits in Family and Consumer Sciences Education

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**Foods I - Fundamentals**
Course Numbers: 7045
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course examines the nutritional needs of the individual. Emphasis is placed on the relationship of diet to health, kitchen and meal management, and food preparation. Skills in science and mathematics are reinforced in this course. Work-based learning strategies appropriate for this course include field trips, job shadowing, and service learning. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Foods II - Advanced**

Course Number: ____
Recommended Maximum Enrollment: 16 or 4 per laboratory kitchen
Recommended Hours of Instruction: 135-180

This course focuses on advanced food preparation techniques while applying nutrition, food science, and test kitchen concepts using new technology. Food safety and sanitation receive special emphasis, with students taking the exam for the ServSafe® credential from the National Restaurant Association. Students develop skills in preparing foods such as beverages, salads and dressing, yeast breads, and cake fillings and frostings. A real or simulated in-school food business component allows students to apply instructional strategies and workplace readiness skills to an authentic experience to develop a portfolio and to enhance FCCLA activities. Skills in science, math, management, and communication are reinforced in this course. Work-based learning strategies appropriate for this course include school-based enterprises, field trips, job shadowing, and service learning.

Prerequisite: Foods I - Fundamentals or Culinary Arts and Hospitality I

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**Foods II - Food Science**
Course Numbers: 7075
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course develops laboratory skills in the scientific evaluation of food, product development, and food preservation. Topics include the investigation of matter, electrolyte solutions, energy, properties, mixtures, and systems as they relate to food. Skills in science and mathematics are reinforced in this course. Work-based learning strategies appropriate for this course include field trips, job shadowing, and internships. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences. A recommended prerequisite for this course is Food II - Advanced.

Prerequisite: Foods I - Fundamentals or Culinary Arts and Hospitality I

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**Housing and Interiors I**

Course Number: 7055
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course examines housing and interior decisions that individuals and families make based on their needs, the environment, and technology. Emphasis is placed on selecting goods and services and creating functional and pleasing living environments based on sound financial decisions and design principles. Skills in mathematics, technology, and art are reinforced in this course. Work-based learning strategies appropriate for this course include field trips, job shadowing, service learning, and school-based enterprises. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Housing and Interiors II**

Course Number: 7152
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 270-360

This is a two block course that prepares students for opportunities in the residential and non-residential interior design fields for entry-level and technical jobs. Topics include application of design theory to interior plans and production, selection of materials, and examination of business procedures. Skills in technology, art, mathematics, and communication are reinforced in this course. Comprising 50 percent of the course work, work-based learning strategies appropriate for this course include field trips, job shadowing, school-based enterprises, internships, cooperative education, and apprenticeships. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: Housing and Interiors I or Apparel Development I

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**Life Management**

Course Number: 7085
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed to empower students to take action for the well-being of themselves and others in the family, workplace, and community. Topics include financial management, personal development, parenting, relationships, career development, and wellness and nutrition. The focus is on what students need to know and be able to do to manage work and family responsibilities within the first five years after high school. Skills in decision making, problem solving, critical thinking, interpersonal relationships, technology, workplace readiness, and communication are reinforced in this course. Work-based learning strategies appropriate for this course include field trips and service learning. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Parenting and Child Development**

Course Number: 7065
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course introduces students to responsible nurturing and basic applications of child development theory. Emphasis is on the parents' responsibilities and the influences they have on children while providing care and guidance. Skills in communication, resource management, and problem solving are reinforced in this course. Work-based learning strategies appropriate for this course include field trips and service learning. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Teen Living**

Course Number: 7015
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course examines life management skills in the areas of personal and family living; wellness, nutrition, and foods; financial management; living environments; appropriate child development practices; fashion and clothing; and job readiness. Emphasis is placed on students applying these skills during their teen years. Through simulated experiences, they learn to fulfill their responsibilities associated with the work of the family and community. Skills in mathematics, communication, science, technology, and personal and interpersonal relationships are reinforced in this course. Work-based learning strategies appropriate for this course include field trips and service learning. FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**LOCAL COURSE OPTIONS**

Schools may offer one or more specialized courses not included in the *Standard Course of Study*. These courses should meet a local economic need. Options may include:

Family and Interpersonal Relationships
Consumer Education and Resource Management

Refer to Part I, Local Course Options, and Appendix B for instructions on how to offer these courses.

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**FOR MORE INFORMATION**

NC Department of Public Instruction
Instructional Services/ITHS
Family and Consumer Sciences
Career - Technical Education
6360 Mail Service Center
Raleigh, NC 27699-6360

# HEALTH OCCUPATIONS EDUCATION

**PROGRAM DESCRIPTION**

The comprehensive Health Occupations Education program seeks to meet present and predicted needs for health care workers within a health care delivery system that is characterized by diversity and changing technologies. It is a program that recruits qualified and motivated students and prepares them for pursuit of appropriate health careers.

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**DESIGN**

Based on natural and social sciences, the humanities, and a researched body of knowledge, the curriculum is designed to offer a foundation of knowledge and skills necessary to health career preparation. Curriculum concepts incorporate technological advances related to the health care delivery system, including ethics, professionalism, prevention (wellness), patient/client diagnosis, treatment, care, and rehabilitation as a result of disease/disorders. Teaching/learning strategies integrate appropriate workplace basic skills that assist students to use resources and technologies, function as effective members within a complex system, and to access and use appropriate information/data.

Guiding students to make relevant connections between abstract theories and concrete applications is emphasized throughout the curriculum. This is especially practiced through team teaching with health professionals and on-site practicums (mentorships/internships).

Opportunities for expanded leadership, management, technical, and citizenship development are available through membership in a co-curricular student organization, Health Occupations Students of America (HOSA). The organization includes local, regional, state, and national levels. Activities integrate curriculum competencies and objectives. Healthy competition through organized and judged skill events assists in strengthening those skills that make students more marketable as potential health care workers. Interaction with health professionals also guides members in the selection of health careers. HOSA seeks to instill an attitude of pride, commitment, and professionalism in its members, and strives to build self-esteem and confidence.

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**MAJOR PROGRAM OUTCOMES**

Health Occupations Education programs are designed to enable students to:

1. Select health career majors suited to their individual needs, aptitudes, abilities, and career development plan.

**MAJOR PROGRAM OUTCOMES CONT'D.**

2. Develop a sound preprofessional and pretechnical multiskilled foundation based on National Health Care Skill Standards.

3. Successfully pursue advanced education and/or entry-level employment in a health career cluster.

4. Develop basic workplace skills as applied to adapting to technological change, transferring of skills to different environments, and functioning as ethical and moral health team members.

5. Acquire and use information relevant to remaining technologically abreast of their chosen health career majors and the health field in general.

6. Develop a professional philosophy as evidenced in personal qualities and practices, that improves the delivery of quality health care and health maintenance to consumers.

7. Become knowledgeable consumers of health care in a consistently changing technological environment.

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**NATIONAL SKILL STANDARDS**

Through a United States Department of Education federal grant managed by Far West Laboratory on Research and Development and in partnership with the National Consortium on Health Science and Technology Education (NCHSTE), voluntary National Health Care Skill Standards have been validated. There are 31 core standards configured into six subsets that address what health care workers need to know and be able to do. Research conducted by North Carolina State University (1995-1996) has provided significant evidence that the secondary Health Occupations Education body of knowledge has integrated each of the standards. VoCATS provides a valid and reliable student assessment.

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**STUDENT CREDENTIALING AND CERTIFICATION**

**Cardiopulmonary Resuscitation (CPR) and Basic First Aid Certification**

- Students who successfully complete Allied Health Sciences I and II or Medical Sciences II may acquire American Red Cross or American Heart Association CPR and Basic First Aid Certification.

**Standard Precautions Proficiency Certification**

- The Occupational Safety and Health Act (OSHA) requires all health care workers who may come in contact with body fluids must demonstrate proficiency in tasks/procedures referred to as "Standard Precautions." Students must demonstrate such

**STUDENT CREDENTIALING AND CERTIFICATION CONT'D**

proficiency prior to their Health Occupations Education clinical internships or mentorships. Evaluation and certification may be given by either local health agency personnel or by a licensed secondary Health Occupations Education teacher.

**Nurse Aide, Level I Certification**

- A student may acquire Nurse Aide Level I certification if the student:

1. Successfully completes selected core competencies in Allied Health Sciences I or Medical Sciences I, Allied Health Sciences II and supplemental competencies identified in the state approved Nurse Aide, Level I curriculum.

2. Is taught by a state approved teacher (Registered Nurse) in a state approved program.

3. Scores at least 85 percent on a written examination and 100 percent on a performance assessment within a health care agency.

Students' names and demographic data are entered into the North Carolina Nurse Aide Central Nurse Registry that is electronically accessible statewide to potential employers.

**DAMON Medical Terminology Certification**

- Students who successfully complete the DAMON Medical Terminology course may receive certification awarded by the local Health Occupations Education program and an approved teacher. The DAMON system is recognized by health agencies and by postsecondary Health Occupations Education programs.

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**PROGRAM UNIQUENESS**

Work-based experiences include an individualized approach with either a minimum of 65 hours in a clinical internship in health agencies, or a minimum of a 45-hour mentorship with a health care professional. Medical liability insurance for negligent acts in health agencies are afforded to students prior to clinical experiences. Health agencies may require testing for tuberculosis and/or other diseases, and a criminal record check for felonies related to drugs.

**COURSE OFFERINGS***

Health Occupations Education course offerings, grades 7-12, are the following:

| Grades 7-8 | Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Exploring Biotechnology | Health Team Relations<br><br>Biomedical Technology | Allied Health Sciences I<br><br>Medical Sciences I | Allied Health Sciences II<br><br>Medical Sciences II | Health Sciences Adv. Studies |

NOTE: Due to the nature of the required liability insurance, the sequencing of Health Occupations Education courses should result in having juniors/seniors only in Allied Health Sciences II and Medical Sciences II.

* NOTE: Work-based learning methods such as internships, cooperative education and apprenticeships may be a part of any course Level 3 or 4 in grades 11-12.

# Health Occupations Education Course Descriptions

**Exploring Biotechnology**

Course Number: 6828
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course focuses on the agricutural and medical industry with emphasis on the relationship of science and technology that affects agriculture, medicine and health care. Topics include career concepts in the agriculture and medical fields. Skills in mathematics, science, and language arts are reinforced in the course. This course contributes to the development of a career development plan. Work-based learning activities appropriate for this course are projects, field trips, and job shadowing. Teaching strategies encourage the development of essential skills and knowledge of the world of work, careers and leadership in the agriculture and medical industries. CECNC leadership activities apply instructional competencies to authentic experiences.

Prerequisite: None

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**Allied Health Sciences I**

Course Number: 7211
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course investigates the health care delivery system, its services, occupations, and related sciences. Topics include the study of the language of medicine, medical mathematics, microbiology, anatomy and physiology, diseases/disorders, diagnoses, treatments, patient/client care regimens, career development, and future technological innovations. Work-based learning strategies include service learning, field trips, and job shadowing. Skills in science, mathematics, communications, social studies and health are reinforced in this course. Projects, teamwork, demonstrations, and HOSA competitive events serve as instructional strategies that reinforce the curriculum content. Biology and Health Education are recommended prerequisites.

Prerequisites: None

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**Allied Health Sciences II**

Course Number: 7212
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 270-360

This course is designed to prepare potential health care workers, preferably seniors, to become effective and efficient multiskilled health team members. Emphasis is placed on the development of proficiency in employability skills, emergency care skills, safety skills, clerical skills, and health care skills. The work-based learning strategy appropriate for this course is a minimum 65-hour clinical internship where student interns deliver health care in local hospitals, medical/dental/veterinarian offices, nursing/convalescent/retirement facilities, wellness centers, etc. Skills in science, mathematics, communications, health, and social studies are reinforced in this course. HOSA activities support networking with health care agencies and professionals through the development of clinical expertise and volunteerism.

Prerequisites: Allied Health Sciences I or Medical Sciences I

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**Biomedical Technology**

Course Number: 7200
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This survey course challenges students to investigate current and 21st century medical and health care practices using computerized databases, the Internet, media, and visiting health team professionals. Topics include the world of biomedical technology, the language of medicine, present and evolving biomedical specialties, biomedical ethics: crises and alternatives, and health career development. Work-based learning strategies include service learning, field trips, and job shadowing. Skills in science, mathematics, communications, health, and social studies are reinforced in this course. HOSA membership provides opportunities for personal and experiential growth.

Prerequisite: None

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**Health Science Advanced Studies**

Course Number: 7299
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This is a culminating course for seniors that is career-focused in a health or medical career. The three parts of the course include a research paper, a product, and a presentation. Students demonstrate their abilities to use content and apply knowledge to real-world situations in a selected career. In addition, they will also demonstrate their abilities to write, speak, apply knowledge, problem solve, and use life skills such as time management and organization. Students work under the guidance of a teacher-facilitator in collaboration with community members, business representatives, and other school-based personnel. HOSA membership provides avenues for applying leadership skills, reinforcing writing and speaking skills, and participating in volunteer activities.

Prerequisites: Three credits in Health Occupations Education

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**Health Team Relations**

Course Number: 7210
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed to assist potential health care workers in their role and function as health team members. Topics include terminology, the history of health care, health care agencies, ethics, legal responsibilities, careers, holistic health, human needs, change, cultural awareness, communication, medical math, leadership, and career decision-making. Work-based learning strategies include service learning, field trips, and job shadowing. Basic academic skills, employability skills, critical thinking skills, teamwork, and the use of technology are reinforced in this course. HOSA leadership activities provide many opportunities for practical application of instructional competencies.

Prerequisite: None

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**Medical Sciences I**

Course Number: 7221
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 135-180

This course uses advanced investigative approaches to the study of human and social sciences as related to medicine and health care. Emphasis includes the language of medicine, body chemistry, anatomy and physiology, and the current and futuristic study of diseases and disorders. Work-based learning strategies include service learning, field trips, and job shadowing. Skills in science, mathematics, health, and social studies are reinforced in this course. HOSA competitive events serve as instructional strategies that reinforce the curriculum content. Biology, Algebra I and Health Education are recommended prerequisites.

Prerequisites: None

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**Medical Sciences II**

Course Number: 7222
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This specialized course is designed to prepare potential health care workers, preferably seniors, for performance in an advanced technical or professional health career. Emphasis is placed on professional development, communications, safety, bioethical/legal practices, healthcare delivery systems, assessment and diagnostic practices, health maintenance practices, and problem-solving and decision-making. Skills in mathematics, science, and communications are reinforced in this course. Work-based learning strategies include the development of individualized clinical skills specifically related to a selected mentorship (minimum of 45 hours) with an exemplary health professional. HOSA activities support networking with health care agencies and professionals through the development of clinical expertise and volunteerism.

Prerequisites: Allied Health Sciences I or Medical Sciences I

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**FOR MORE INFORMATION**

NC Department of Public Instruction
Instructional Services/BHC
Health Occupations Education
Career - Technical Education
6359 Mail Service Center
Raleigh, NC 27699-6359

# MARKETING EDUCATION

**PROGRAM DESCRIPTION**

The purpose of the Marketing Education instructional program is to prepare students for advancement in marketing and management careers and/or future studies in two-year technical/community colleges or four-year colleges or universities. Marketing is a vast and diverse discipline. It encompasses activities within production, as well as aspects of consumption. It is as specific as procedures for inventory control and, at the same time, as general as the creativity needed in effective promotion. The function of marketing occurs in all industries. Application of skills in reading, writing, mathematics, problem-solving, psychology, and critical thinking are found throughout the curriculum.

Based upon the National Marketing Education Standards and the National Curriculum Framework, courses in Marketing Education provide students with essential skills necessary to succeed in the workplace. The basic skills of reading, writing, and mathematics are an integral part of the Marketing Education curriculum. Skills in academic and technical areas are combined with the use of technology to provide students the foundation our business and industry leaders demand. Emphasis is placed on the development of competence in marketing functions and foundations, economic foundations, and human resource foundations to create a well-rounded education, enabling students to pursue further education in their chosen marketing career.

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**DESIGN**

The high school scope and sequence of Marketing Education includes varied program offerings for students in grades 9-12 (levels 1-4). Students may enter the program and progress through the Business Technologies Career Pathway in one of seven career majors:

- Marketing Technologies
- Sales & Technical Services
- Travel, Tourism, and Recreation Marketing
- Business Management and Small Business/Entrepreneurship
- Fashion Merchandising
- Business Administration
- Sports and Entertainment Marketing

Work-based learning strategies should be practiced throughout the Marketing Education curriculum.

Opportunities to develop and apply leadership, social, civic, and career-technical skills in marketing are provided through DECA, an association for Marketing Education students. As an integral part of the instructional program, students engage in performance activities to

demonstrate their mastery of knowledge to business and industry leaders. These organized activities help to interpret the Marketing Education program to the business community, faculty, parents, and other students.

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**MAJOR PROGRAM OUTCOMES**

Marketing Education programs in the secondary schools are designed to enable students to:

- Make realistic career choices regarding marketing careers.
- Prepare for further education in the discipline of marketing.
- Develop occupational and entrepreneurial skills necessary for initial employment and advancement in a marketing career.
- Develop an understanding and appreciation of the social, civic, and economic values of the production, marketing, and consumption of goods and services.
- Participate in work-based learning activities that allow skill application in a marketing-related field.
- Develop initiative and leadership skills.
- Develop and apply communication, computational, ethics, problem-solving, critical thinking, and planning competencies that will enable them to pursue further education and/or advance more rapidly in a chosen marketing career.

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**NATIONAL VOLUNTARY SKILL STANDARDS**

**National Skill Standards for the Hospitality and Tourism Industry**

Through the Council of Hotel, Restaurant, and Institutional Education (CHRIE), in conjunction with the National Marketing Education Standards, skill standards for the hospitality and tourism industry have been developed. Food, lodging, travel-related, and recreational services are addressed in these standards. These standards are integrated into the Travel, Tourism, and Recreation Marketing curriculum.

**National Retail Skill Standards**

The National Retail Federation (NRF) developed skill standards for the retail sales associate to promote a high performance work organization at the point where the greatest number of jobs and the opportunity for driving profit coexist. These standards are addressed in the Marketing, Marketing Management, and Fashion Merchandising curricula through personal selling competencies.

**National Voluntary Curriculum Standards**

The North Carolina Marketing Education Curriculum is based on the National Marketing Education Curriculum Framework. This framework

**NATIONAL VOLUNTARY SKILL STANDARDS CONT'D.**

was developed through a joint effort of the U. S. Department of Education, the Marketing Education Resource Center, business and industry leaders, and marketing educators across the nation.

The Curriculum Framework is divided into four foundational areas and seven marketing functions. The four foundations support the seven marketing functions.

The four broad foundational areas include:

- Business, Management, and Entrepreneurship
- Communication and Interpersonal Skills
- Economics
- Professional Development

The seven specific functional areas include:

- Distribution
- Financing
- Marketing-Information Management
- Pricing
- Product/Service Management
- Promotion
- Selling

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**COURSE OFFERINGS***

Marketing Education course offerings, grades 7-12, are as follows:

| Grades 7-8 | Levels | | | |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 |
| Exploring Business Technologies | Principles of Business and Personal Finance | Marketing<br>Fashion Merchandising<br>Sports and Entertainment Marketing I | Travel, Tourism, and Recreation Marketing<br>Marketing Management<br>Small Business/ Entrepreneurship<br>Sports and Entertainment Marketing II | Marketing Advanced Studies<br>Marketing Technology and Media<br>Strategic Marketing |

*NOTE: Work-based learning methods such as internships, cooperative education, and apprenticeships may be part of any course in grades 9-12.

# Course Descriptions for Marketing Education

**Exploring Business Technologies**

Course Number: 6208
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course is designed to explore the nature of business in an international economy and to study related careers in fields such as entrepreneurship, financial services, information technology, marketing, office systems technology, public relations and promotion, and travel and tourism. Emphasis is on using the computer while studying applications in these careers along with problem solving and thinking skills. Communication and mathematics skills are reinforced as students explore business applications and careers. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA or CECNC leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies. This course contributes to the development of a career development plan.

Prerequisite: None

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**Fashion Merchandising**

Course Number: 6631
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed for students interested in the fashion industry and the merchandising of fashion. Topics include an overview of the fashion industry, evolution and movement of fashion, career development, merchandising, risk management, promotion, and fashion show production. Skills in research, mathematics, textile chemistry, and technical writing are reinforced in this course. Work-based learning strategies appropriate for this course include cooperative education or paid/unpaid internships. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisite: None

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**Marketing**

Course Number: 6621
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed to help students develop basic knowledge, skills, and attitudes that will prepare them to enter the field of marketing. The course, which focuses on the National Marketing Education Standards and the National Curriculum Framework, emphasizes the foundations of business, management, and entrepreneurship; economics; professional development; and communication and interpersonal skills. Included in these foundations are concepts such as distribution, financing, selling, pricing, promotion, marketing-information management, and product/service management. Skills in communications, mathematics, and psychology are reinforced in this course. Work-based learning strategies appropriate for this course include job shadowing, paid/unpaid internships, school-based enterprises, field trips, and/or cooperative education.

Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisite: None

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**Marketing Technology and Media**

Course Number: 6665
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This course is designed to couple the marketing and economic skills students have mastered with the latest technology in marketing sales, mass media, research, and customer service presentation techniques. Emphasis is placed on creating a professional, polished approach to marketing products and services. Skills in technical writing, communications, mathematics, and application of current computer software are reinforced in this course. Work-based learning strategies appropriate for this course include paid/unpaid internships and apprenticeships. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisites: Marketing, Fashion Merchandising, or Strategic Marketing, and Computer Applications I.

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**Marketing Management**

Course Number: 6622
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed to continue the foundations covered in Marketing or Fashion Merchandising. Topics of study include recruiting, hiring, training and evaluating employees; information management; purchasing; pricing; ethics; sales management; and financing. Skills in math, human relations, communications, and technical writing are reinforced in this course. Work-based learning strategies appropriate for this course are school-based enterprises, cooperative education, paid/unpaid internships, and apprenticeships. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisites: Marketing or Fashion Merchandising

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**Marketing Advanced Studies**

Course Number: 6699
Recommended Maximum Enrollment: 16
Recommended Hours of Instruction: 135-180

This is a culminating course for seniors who are career-focused in Marketing Technologies; Sales and Technical Services; Travel, Tourism, and Recreation Marketing; Business Management and Small Business/ Entrepreneurship; Fashion Merchandising; Business Administration; or Sports and Entertainment Marketing. The three components of the course include writing a research paper, producing a product, and delivering a presentation. Students demonstrate the ability to use content and apply knowledge to real-world situations in a career major. In addition, they will also demonstrate the ability to write, speak, apply knowledge,

problem solve, and use life skills such as time management, planning, follow through, and organization. Students work under the guidance of a teacher facilitator in collaboration with community members, business representatives, and other school-based personnel. Simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: The student must have completed three technical credits in the Business Technologies Pathway.

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**Principles of Business and Personal Finance**

Course Number: 6600
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction 135-180

This course is an introductory course covering principles and concepts that are the foundation for future study of business and management of work projects. Topics of study include basic business principles; personal finance concepts; management concepts; systems thinking and quality management; and the current environment for business in a multinational marketplace. Communication skills and basic mathematical concepts are reinforced in this course. Work-based learning strategies appropriate for this course are field trips and job shadowing. In addition to simulations, projects, and teamwork, DECA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

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**Small Business/ Entrepreneurship**

Course Number: 6615
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed to introduce students to the rewards and risks of owning or operating a business enterprise. Emphasis is placed on the mastery of skills needed to plan, organize, manage, and finance a small business. Skills in communication, technical writing, mathematics, research, and problem-solving are reinforced as each student prepares his/her own business plan. Work-based learning strategies appropriate for this course include cooperative education and paid/unpaid internships. In addition to simulations, projects, and teamwork, DECA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: The student must have completed two technical credits in the same career pathway.

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**Sports and Entertainment Marketing I**

Course Number: ____
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed for students interested in sports, entertainment, and event marketing. Emphasis is placed on the following principles as they apply to the industry: branding, licensing, and naming rights; business foundations; concessions and on-site merchandising; economic foundations; promotion; safety and security; and human relations. Skills in communications, human relations, psychology, and mathematics are reinforced in this course. Work-based learning strategies appropriate for this course include cooperative education, paid/unpaid internships, or school-based enterprises. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisite: None

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**Sports and Entertainment Marketing II**

Course Number: ____
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed for students interested in an advanced study of sports, entertainment, and event marketing. Emphasis is placed on the following principles as they apply to the industry: Business management, career development options, client relations, ethics, events management, facilities management, legal issues and contracts, promotion, and sponsorships. Skills in communications, human relations, mathematics, psychology, and technical writing are reinforced in this course. Work-based learning strategies appropriate for this course include cooperative education, paid/unpaid internships, or school-based enterprises. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisite: Sports and Entertainment Marketing I

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**Strategic Marketing**

Course Number: 6626
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This fast-paced course challenges students by combining in one course the content taught in the Marketing and Marketing Management courses. The curriculum, activities, and resources utilized in this course are written at the freshman college level. Topics include economics, marketing research and decision making, domestic and international markets and influences, human resource development, ethics, management, and financial analysis. Skills in mathematics, research, and critical thinking are reinforced in this course. Work-based learning strategies appropriate for this course include cooperative education and paid/unpaid internships. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisite: None

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**Travel, Tourism, and Recreation Marketing**

Course Number: 6645
Recommended Maximum Enrollment: 20
Recommended Hours of Instruction: 135-180

This course is designed to provide a foundation for students interested in a career in travel, tourism, and recreation marketing. Emphasis is placed on the hospitality/tourism industry, customer relations, travel destinations, tourism promotion, economics, and career development. Skills in mathematics, psychology, geography, and communications are reinforced in this course. Work-based learning strategies appropriate for this course include cooperative education or paid/unpaid internships. Marketing simulations, projects, teamwork, DECA leadership activities, meetings, conferences, and competitions provide many opportunities for application of instructional competencies.

Prerequisite: Marketing

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**LOCAL COURSE OPTIONS**

Schools may offer one or more specialized courses not included in the *Standard Course of Study.* These courses should meet a local economic need. Options may include:

Fashion Merchandising and Management
International Marketing

Refer to Part I, Local Course Options, and Appendix B for instructions on how to offer these courses.

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**PARTNERING OPPORTUNITIES**

The following are external, nationally recognized programs. The participants must be member schools of these organizations and follow the curriculum requirements of these partnerships. NCDPI will not provide any curriculum materials for these programs.

- International Baccalaureate (IB) Business Management
- National Academy Foundation (NAF) Academy of Finance
- National Academy Foundation (NAF) Academy of Travel and Tourism

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**FOR MORE INFORMATION**

NC Department of Public Instruction
Instructional Services/B&M
Marketing Education
Career - Technical Education
6358 Mail Service Center
Raleigh, NC 27699-6358

# MIDDLE GRADES

**PROGRAM DESCRIPTION**

Career development is a lifelong process by which individuals develop and refine their self-identity as it relates to life and employment decisions. Middle grades students have reached a critical age when they can explore career decision making and develop future educational plans. Career development experiences for middle grades students are designed to be exploratory in nature and do not develop specific skills, except in Business Computer Technology and Keyboarding. However, in the other five middle grades courses, students will develop a knowledge of self and the world of work and begin a career development planning process for bringing the two together.

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**DESIGN**

Curriculum design, materials, and teaching strategies take into account the characteristics, nature, and learning styles of the middle grades student. Teaching strategies recommended for all course offerings include:

1. Hands-on approaches
2. Cooperative learning
3. Inquiry methods
4. Community involvement
5. Integration of academic skills

Commonalities among all course offerings include:

1. Critical and creative thinking
2. Communication skills
3. Problem solving
4. Leadership/citizenship
5. Career information and planning
6. Impact of technology

It is recommended that Exploring Career Decisions be included in any given sequence. Local school systems should select courses that will provide a continuum of experiences for the middle grades learner. These courses will provide building blocks from which students may choose based on the results of their interest inventories and assessments. Development of an individual career development plan should be the outcome of the middle grades experience.

Opportunities for leadership development and further application of instructional competencies are provided through student participation in Career Exploration Clubs of North Carolina (CECNC) or a program area career-technical student organization. Options include: FBLA, FFA, FCCLA, or TSA.

**PROGRAM UNIQUENESS**

Keyboarding and Business Computer Technology taught at the middle school level are designed to develop keying and formatting skills, appropriate techniques, and basic technology applications.

Keyboarding and Business Computer Technology should not be the sole provider of computer skill exposure at the middle grades. A combination of Keyboarding and Business Computer Technology is designed to reinforce and compliment the computer skills being integrated throughout the elementary and middle school curriculum.

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**MAJOR PROGRAM OUTCOMES**

The career development program at the middle grades level is designed to assist students in:

1. Making wise decisions about choices related to themselves and to the world of work.
2. Developing an individual career development plan.

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**NATIONAL CURRICULUM STANDARDS**

In 1986, the National Occupational Information Coordinating Committee (NOICC) launched the National Career Development Guidelines initiative. These guidelines have been endorsed by the North Carolina State Board of Education and are being implemented in educational programs throughout the state. The guidelines reflect professional consensus in three main areas:

1. Competencies and indicators for individual growth in self knowledge, educational and occupational exploration, and career planning.
2. Organizational capabilities to support competency-based career development programs.
3. Professional competencies that counselors and other staff must possess to deliver an effective career development program.

Education is a continuum that helps us take advantage of the opportunities in the workplace and to adapt to changing skill needs. Career development plays a key role in this continuum and the National Career Development Guidelines clearly recognize that need.

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**COURSE OFFERINGS** Middle Grades Course Offerings, Grades 6-8, are the following:

| Grades 6-8 | Grades 7-8 |
|---|---|
| Exploring Career Decisions<br><br>Keyboarding | Business Computer Technology<br><br>Exploring Biotechnology<br><br>Exploring Business Technologies<br><br>Exploring Life Skills<br><br>Exploring Technology Systems |

**Courses are shown at the first grade level at which they may be offered.**

# Course Descriptions for Middle Grades

**Business Computer Technology**

Course Number: 6400
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 67-90

This course is designed to provide hands-on instruction in basic computer hardware components and software applications. Emphasis is placed on extending and reinforcing touch keying skills while providing experience for learning word processing, database, spreadsheet, graphics, multimedia, and telecommunications applications. Communication skills and basic mathematical concepts are reinforced in this course. Work-based learning strategies appropriate for this course are field trips and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: Keyboarding

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**Exploring Biotechnology**

Course Number: 6828
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course focuses on the agricultural and medical industry with emphasis on the relationship of science and technology that affects agriculture, medicine and health care. Topics include career concepts in the agriculture and medical fields. Skills in mathematics, science, and language arts are reinforced in the course. This course contributes to the development of a career development plan. Work-based learning activities appropriate for this course are projects, field trips, and job shadowing. Teaching strategies encourage the development of essential skills and knowledge of the world of work, careers and leadership in the agriculture and medical industries. FFA and CECNC leadership activities apply instructional competencies to authentic experiences.

Prerequisite: None

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**Exploring Business Technologies**

Course Number: 6208
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course is designed to explore the nature of business in an international economy and to study related careers in fields such as entrepreneurship, financial services, information systems, marketing, office systems technology, public relations and promotion, and travel and tourism. Emphasis is on using the computer while studying applications in these careers along with problem solving and thinking skills Communication and mathematics skills are reinforced as students explore business applications and careers. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies. This course contributes to the development of a career development plan.

Prerequisite: None

**Exploring Career Decisions**

Course Number: 6158
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course is designed to provide an orientation to the world of work. Experiences are designed to introduce students to the technical nature of today's world and the role of productive workers. Activities enable students to increase self-awareness and make wise educational and occupational decisions as they plan for careers. Work-based learning strategies appropriate for this course include job shadowing and field trips. Opportunities for leadership development and further application of instructional competencies are provided through Career Exploration Clubs of North Carolina (CECNC). The formal career development planning process often begins within this course.

Prerequisite: None

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**Exploring Life Skills**

Course Number: 7018
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course explores life skills essential for the adolescent now and in the future. Units include resource management, relationships, nutrition and wellness, childcare, and career pathways. Resource management includes decision-making, interior design, and managing a sewing project. Relationships focus on personal and social responsibilities with emphasis on the family across the life span. The focus is on developing a foundation for the application of life management skills. Skills in applying basic academics, problem-solving, decision-making, and creative and critical thinking are reinforced in this course. This course also contributes to the development of the career development plan. Work-based learning strategies appropriate for this course include field trips, job shadowing, and service learning. Life skills development and FCCLA leadership activities provide the opportunity to apply instructional competencies and workplace readiness skills to authentic experiences.

Prerequisite: None

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**Exploring Technology Systems**

Course Number: 8108
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course is designed to allow students to explore basic technological concepts and related career fields. Topics include technology systems, technical drawing, graphic design, modeling skills, computer systems, electronics, and audio/visual production. Activities are structured to integrate physical and social sciences, mathematics, language, and fine arts. This course contributes to the development of a career development plan. Work-based learning strategies appropriate for this course include job shadowing and field trips. Exploring Technology Systems and TSA technical and leadership activities enhance the students' appreciation of technical and engineering career fields.

Prerequisite: None

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**Keyboarding**

Course Number: 6511
Recommended Maximum Enrollment: 26
Recommended Hours of Instruction: 67-90

This course is designed to teach middle grades students basic keying skills, which consist of fluent manipulation of letter, figure/symbol, and basic service keys by touch. Emphasis is on daily use of a computer system and appropriate software to provide integrated training through a learn/practice/sustain/assess plan of skill building. Communication skills are reinforced as students format, compose, and proofread. Work-based learning strategies appropriate for this course are service learning, field trips, and job shadowing. In addition to simulations, projects, and teamwork, FBLA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

Prerequisite: None

**FOR MORE INFORMATION**

NC Department of Public Instruction
Instructional Services/BHC
Middle Grades Education
Career - Technical Education
6359 Mail Service Center
Raleigh, NC 27699-6359

# TECHNOLOGY EDUCATION

**PROGRAM DESCRIPTION**

Technology Education helps students develop an appreciation and fundamental understanding of technology through the study and application of materials, tools, processes, inventions, structures and artifacts of the past and present. Technology may be defined as "How people modify their natural world to suit their purposes" (from Technology for All Americans). This series of courses allows students to apply knowledge, tools, skills, and insights to the solving of problems found in communication, manufacturing, structural, and transportation systems. To a lesser degree, the areas of bio-technology, agriculture, and medical technology also are addressed. Students learn about and from technology, by applying technological principles and concepts as well as abstract ideas and concepts of mathematics, science, language arts, and social studies. Through this integrated study of technology, students develop an understanding of the importance and role of technology in our society and the economy and its impacts upon the environment.

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**DESIGN**

Technology Education courses are an equal balance between hands-on laboratory experiences and knowledge and understanding. Students are given the opportunity to apply the principles and concepts addressed within the curriculum through experimentation and research, design, problem solving, formal and informal presentations, and virtual and physical modeling. The middle grades *Exploring Technology Systems* course offers students an overview of various technology systems as well as an opportunity to reflect upon technology occupations. At the high school level, communication skills and problem-solving are major focuses of the prerequisite course, *Fundamentals of Technology*. Emphasis is placed on continued skill development and the use of more complex tools central to *Technology Advanced Studies* and the systems courses. Topics include technical communication, problem-solving, modeling, safety, and technology assessment.

The systems courses (Communication, Manufacturing, Structural and Transportation) develop indepth skills and understandings in their respective areas. The two *Principles of Technology* courses provide students with a fundamental understanding of physics. These courses are laboratory based and are designed to permit students the opportunity to apply physics concepts to practical situations. The course series *Scientific and Technical Visualization* (SciVis) allows students to develop complex graphic skills that have virtually universal application. While the primary focus is on science and technological subjects, students may easily transfer their work to such areas as business, social studies and the arts.

The culminating course *Technology Studies* offers students the opportunity to select and pursue a topic they find interesting and challenging using the skills and insights gained from their technology course work and general education experience. This systematic approach to learning about technology prepares students for the rapidly changing technological world by developing skills necessary for adapting to new technologies as they evolve. It increases the likelihood that they become full participants in the global economy and rewarded and productive citizens.

The Technology Student Association (TSA) is also an essential component of Technology Education. Through TSA, students learn and apply technical, leadership, social and civic skills. Students become effective team members through the use and development of interpersonal and technical skills. TSA activities are an integral part of the Technology Education program and relate directly to the program outcomes.

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**MAJOR PROGRAM OUTCOMES**

Programs in Technology Education are designed to help students:

1. Acquire general technological literacy.
2. Access, process, and share information through the use of contemporary tools and processes.
3. Acquire and apply design, problem-solving, and leadership skills.
4. Assess the implications of technology upon society, the economy, and the environment.
5. Appreciate the importance of technology and its effect on all aspects of human behavior and systems.
6. Use simple and complex tools and concepts found in communication, manufacturing, structural, and transportation systems.
7. Apply physical and social sciences, mathematics, and language and fine arts concepts and principles in an authentic manner.
8. Make wise career decisions.
9. Become more knowledgeable citizens and consumers regarding issues of technology.
10. Become responsible, participating, and successful citizens.

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**NATIONAL VOLUNTARY CURRICULUM STANDARDS**

The *Standards for Technological Literacy* were initiated by the International Technology Education Association (ITEA) and funded by the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA). The project, *Technology for All Americans*, has created a rationale, structure, and framework for Technology Education K-12. These standards identify what all students should know and be able to do with respect to understanding technology. The North Carolina Technology Education Program has been designed to reflect the *Standards for Technological Literacy* standards and benchmarks.

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**PROGRAM UNIQUENESS**

1. Technology Education develops an understanding of complex technologies through the systems approach to problem solving. Students participate in designing, developing, monitoring, assessing, correcting, and improving technological systems. Technology Education provides a foundation for students to make career decisions leading to other career-technical education courses of study.

2. Principles of Technology I or Principles of Technology II can count as the third science credit required for graduation under these conditions:

   a. PT I can count as a science elective, a physical science credit, or as the course Physical Science (3010). The Physical Science Course (3010) would be subject to the EOC test.
   b. PT II can count as a science elective, a physical science credit, or as the course Physics (3060). The Physics Course (3060) would be subject to the EOC test.

3. North Carolina has recognized a national pre-engineering program as an option in Technology Education. Project Lead The Way Inc. (PLTW) is the national program forming partnerships among Public Schools, Higher Education Institutions and the Private Sector to increase the quantity and quality of engineers and engineering technologist graduating from our educational system.

   PLTW has developed a four year sequence of courses for high schools which, when combined with traditional mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. The courses are Introduction to Engineering Design, Digital Electronics, Computer Integrated Manufacturing, Principles of Engineering, and Engineering Design and Development. Introduction at this level will attract more students to engineeering, and will allow students, while still in high school, to determine if engineering is the career they desire. The PLTW graduate will be better prepared for college engineering programs and more likely to be successful. School systems file a modification to use this program. For additional information visit: http://www.pltw.org.

   PLTW has also developed a middle school program, Gateway to Technology. The purpose of this middle school curriculum is to expose students to a broad overview of the field of technology and its related processes. Because engineers use mathematics, science, and technology to solve problems, the course has been designed to be "activity oriented." It incorporates four units, each designed to be taught in a period of ten weeks. Each unit is an independent unit, developed specifically for the student's age and comprehension level. It is recommended that they be taught in the following order: Design

and Modeling, The Magic of Electrons, The Science of Technology and Automation and Robotics. School systems file a modification to use this program. For additional information visit: http:// www.pltw.org.

**COURSE OFFERINGS***

Technology Education course offerings, grades 7-12, are the following:

| Grades 7-8 | Academic Levels* | | | |
|---|---|---|---|---|
| | Levels 1 | Levels 2 | Levels 3 | Levels 4 |
| Exploring Technology Systems | Fundamentals of Technology | Communication Systems<br>Manufacturing Systems<br>Structural Systems<br>Transportation Systems<br>Principles of Technology I<br>Scientific and Technical Visualization I | Principles of Technology II<br>Scientific and Technical Visualization II | Technology Advanced Studies |

*NOTE: Work-based learning methods such as internships, cooperative education, and apprenticeships may be a part of any course in grades 9-12.

# Course Descriptions for Technology Education

**Communication Systems**

Course Number: 8125
Recommended Maximum Enrollment: 21
Recommended Hours of Instruction: 135-180

This course introduces students to classical and contemporary visual, audio and electronic communication using state-of-the-art technology. Emphasis is placed on analyzing, designing, testing and evaluating communication systems such as: computer operating systems, the Internet, electronic, optical and digital communication systems, and concentrated areas of study determined by students and their teacher. Activities are structured to integrate physical and social sciences, mathematics, language and fine arts, and technical studies. Work-based learning strategies appropriate for this course include school-based enterprise, job shadowing, and service learning projects. This course and TSA technical and leadership activities develop skills essential for students interested in pursuing technical or engineering careers in communication related fields.

Prerequisite: Fundamentals of Technology

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**Exploring Technology Systems**

Course Number: 8108
Recommended Maximum Enrollment: 18
Recommended Hours of Instruction: 67-90

This course allows students to explore basic technological concepts and principles and related career fields. Topics include design and problem solving, technology assessment, technology systems, technical sketching, CAD, graphic design, modeling skills, computer systems, electronics, and audio/visual production. Activities are structured to integrate physical and social sciences, mathematics, and language and fine arts. This course contributes to the creation of a career development plan. Work-based learning strategies appropriate for this course include job shadowing and field trips. This course and TSA technical and leadership activities enhance the students' appreciation of technical and engineering career fields.

Prerequisite: None

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**Fundamentals of Technology**

Course Number: 8110
Recommended Maximum Enrollment: 21
Recommended Hours of Instruction: 135-180

This course provides prerequisite hands-on experiences in principles and processes essential for the study of the technology systems courses and develops a foundation for students interested in any technical field of study. Emphasis is placed on problem-solving, design, technical communication, modeling, testing, evaluation, and implications of technology. Activities are structured to integrate physical and social sciences, mathematics, language and fine arts. Work-based learning strategies appropriate for this course include job shadowing and field trips. This course and TSA technical and leadership activities develop skills essential for students interested in technical or engineering career fields.

Prerequisite: None

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**Manufacturing Systems**

Course Number: 8115

Recommended Maximum Enrollment: 21

Recommended Hours of Instruction: 135-180

This course introduces students to principles of past and present manufacturing systems. Emphasis is placed on computer modeling, flexible manufacturing systems and computer-aided manufacturing concepts. Students assess their solutions through mass property analysis and modification using contemporary manufacturing methods. Activities are structured to integrate physical and social sciences, mathematics, and language and fine arts. Work-based learning strategies appropriate for this course include school-based enterprise, job shadowing, and service-learning projects. This course and TSA technical and leadership activities develop skills essential for students interested in pursuing careers in manufacturing as a designer, drafter, industrial manager, technician, or engineer.

Prerequisite: Fundamentals of Technology

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**Principles of Technology I**

Course Number: 8011

Recommended Maximum Enrollment: 16

Recommended Hours of Instruction: 135-180

This course provides a hands-on approach to understanding the fundamental principles and concepts of physics and associated mathematics. Emphasis is placed on understanding mechanical, electrical, fluid, and thermal systems as they relate to work, force, rate, resistance, energy, and power. Activities are structured to integrate science, mathematics, and language arts. Work-based learning strategies appropriate for this course include job shadowing and field trips. This course and TSA technical and leadership activities enhance the skills of students interested in pursuing technical, engineering, or science related careers. Algebra I and Fundamentals of Technology are recommended prerequisites.

Prerequisite: None

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**Principles of Technology II**

Course Number: 8012

Recommended Maximum Enrollment: 16

Recommended Hours of Instruction: 135-180

A continuation of laboratory-based experiences, students focus on mechanical, electrical, fluid, and thermal systems as they relate to force transformers, momentum, waves and vibrations, energy convertors, transducers, radiation theory, optical systems, and time constants. Activities are structured to integrate science, mathematics, and language arts. Work-based learning strategies appropriate for this course include job shadowing, and field trips. This course and TSA activities further enhance the skills essential for success in technical, engineering, and science related fields.

Prerequisite: Principles of Technology I

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