July 2000

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Technology Studies
Occupational Area:	Technology Education
Program Numbers:	8600100
CIP Number:	0821010100
Grade Level:	Secondary 9-12, & 30, 31
Standard Length:	3 Credits
Facility Design Code:	243, Related 803, 808, 849, 851, 852
CTSO:	Florida Technology Student Association (FL-TSA)
Certification:	INDUS ARTS @4 @6 I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

Listed below are the courses that make up this program. Design code 243 is the appropriate laboratory facility for this program.

8600510 - Technology Studies I
8600610 - Technology Studies II
8601710 - Technology Studies III

II. **LABORATORY ACTIVITIES:** Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. **SPECIAL NOTE:** The Florida Technology Student Association (FL-TSA) is the appropriate Career and Technical Student Organization for providing leadership training experiences and reinforcing specific vocational skills. Career and Technical Student Organizations, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC. FL-TSA information can be obtained from the web site at <http://www.florida-tsa.net>.

Advanced Applications in Technology (AAiT) - course number 8601900 is appropriate to be used for content area continuation in this program after all three credits of this program have been completed. The purpose of this course is to provide students with the opportunity to develop a school based project from "vision" to "reality". Working in teams to design, engineer, manufacture, construct, test, redesign, test again; and then produce a finished "project". This would involve using ALL the knowledge previously learned, not only in Technology Education but also across the curriculum. See the (AAiT) framework for more information.

Work-Based Experience (WBE) - course number 8601800 is the appropriate course to provide Technology Education students with

the opportunity, as Student Learners, to gain real world practical, first-hand exposure in broad occupational clusters or industry sectors through a structured, compensated or uncompensated experience. Work-Based Experience is also designed to give the Student Learners an opportunity to apply and integrate the knowledge, skills, and abilities acquired during their School-Based Experience to actual work situations independent of school facilities. At least one credit of a Technology Education program consisting of three credits must be completed before enrolling in WBE. See the (WBE) framework for more information.

The Intermediate and Advance courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student shall master to earn credit must be specified on an individual basis in each students Individual Educational Plan (IEP).

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Identify evolving technologies in our technological world.
13.0 Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.
14.0 Demonstrate knowledge and perform special skills unique to the physical technologies.
15.0 Demonstrate knowledge and perform special skills unique to the information/communication technologies.
16.0 Demonstrate knowledge and perform special skills unique to the biotechnologies.
17.0 Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.
18.0 Demonstrate knowledge and perform special skills unique to the physical technologies.

19.0 Demonstrate knowledge and perform special skills unique to the information/communication technologies.
20.0 Demonstrate knowledge and perform special skills unique to the biotechnologies.
21.0 Demonstrate knowledge and application of robotics technology.
22.0 Demonstrate knowledge and application of programmable controller technology.
23.0 Demonstrate the techniques of computer numerical control technology.
24.0 Demonstrate knowledge and application of computer aided drafting technology.
25.0 Demonstrate knowledge and application of laser technology.
26.0 Demonstrate knowledge and application of mechanical systems.
27.0 Demonstrate knowledge and application of fluid systems.
28.0 Demonstrate knowledge and application of electrical systems.
29.0 Demonstrate the use of fiber optics.
30.0 Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600510
Course Title: Technology Studies I
Course Credit: 1

COURSE DESCRIPTION: This course provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work station within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

- 03.01 Define terms related to computers.
- 03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--The student will be able to:

12.01 List five technologies that did not exist five years ago.
12.02 Use the problem-solving process to generate three potential improvements to a recent, or evolving technology.

13.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--The student will be able to:

13.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
13.02 Name and define the three basic elements of all systems.
13.03 Name components of the three basic elements of a system.
13.04 Name the six basic parts of the energy system.
13.05 State the function of each of the basic parts of the energy system.
13.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--The student will be able to:

14.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
14.02 Describe three careers for each of the physical technologies identified in 14.01.
14.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
14.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
14.05 Identify and demonstrate the tools, processes, and materials used in manufacturing technology to perform computer-aided manufacturing.
14.06 Identify and demonstrate various ways that people and goods are transported.
14.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--The student will be able to:

15.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
15.02 Describe three careers for each of the communications technologies identified in 15.01.
15.03 Identify and demonstrate the tools, processes and materials used in the information/communication technologies.
15.04 Compare and contrast different processes of communication technologies.
15.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed words, drawing and pictures.
15.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
15.07 Identify several telecommunication services.
15.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--The student will be able to:

16.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
16.02 Describe three careers for each of the technology areas in 16.01.
16.03 Explain the three areas into which modern biotechnology is divided.
16.04 Contrast the seven resources for biotechnology with other technologies.
16.05 Identify several impacts of biotechnology on society and the environment.
16.06 Identify the role of biotechnology in agriculture, food production, and medicine.
16.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.

16.08 Identify several outputs of biotechnology and their related biotechnologies.

16.09 Demonstrate problem solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600610
Course Title: Technology Studies II
Course Credit: 1

COURSE DESCRIPTION: This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work station within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

- 03.01 Define terms related to computers.
- 03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

17.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--The student will be able to:

17.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
17.02 Name and define the three basic elements of all systems.
17.03 Name components of the three basic elements of a systems.
17.04 Name the six basic parts of the energy system.
17.05 State the function of each of the basic parts of the energy system.
17.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

18.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--The student will be able to:

18.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
18.02 Describe three careers for each of the physical technologies identified in 18.01.
18.03 Identify and demonstrate the tools, processes, and materials used in construction technology.

18.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
18.05 Identify and demonstrate the tools, process, and materials used in manufacturing technology to perform computer-aided manufacturing.
18.06 Identify and demonstrate various ways that people and goods are transported.
18.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in the course.

19.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--The student will be able to:

19.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
19.02 Describe three careers for each of the communications technologies identified in 19.01.
19.03 Identified and demonstrate the tools, processes and materials used in the information/communication technologies.
19.04 Compare and contrast different processes of communication technologies.
19.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed works, drawing and pictures.
19.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
19.07 Identify several telecommunication services.
19.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

20.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--The student will be able to:

20.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
20.02 Describe three careers for each of the technology areas in 20.01.
20.03 Explain the three areas into which modern biotechnology is divided.
20.04 Contrast the seven resources for biotechnology with other technologies.
20.05 Identify several impacts of biotechnology on society and the environment.
20.06 Identify the role of biotechnology in agriculture, food production, and medicine.
20.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.
20.08 Identify several outputs of biotechnology and their related biotechnologies.
20.09 Demonstrate problem-solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

21.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ROBOTICS TECHNOLOGY--The student will be able to:

21.01 Identify three types of robots.
21.02 State the function of effectors, sensors, controllers, and auxiliary parts in a robotics system.
21.03 Operate a robot using a teach pendant.
21.04 Program a robot using a computer to perform a specific task.
21.05 Explain three impacts of robotics on society.
21.06 Demonstrate problem-solving skills relative to robotics utilizing the techniques learned in this course.

22.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--The student will be able to:

22.01 State the function of the component parts of a programmable controller.
22.02 List several advantages of using programmable controllers.
22.03 Demonstrate logical continuity and branching functions with a programmable controller.

23.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER NUMERICAL CONTROL TECHNOLOGY--The student will be able to:

23.01 Demonstrate the technique of computer numerical control to perform and engraving and a milling activity.
23.02 Demonstrate problem-solving skills relative to computer numerical control utilizing the techniques learned in this course.

24.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER-AIDED DRAFTING TECHNOLOGY--The student will be able to:

24.01 Compare and contrast computer-aided drafting with non-computer aided drafting in terms of speed consistency, neatness, and accuracy.
24.02 Demonstrate the application of a computer and software program in doing several computer-aided drawings.
24.03 Identify computer-aided drafting hardware.
24.04 Demonstrate program-solving skills relative to computer-aided drafting utilizing the techniques learned in this course.

25.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF LASER TECHNOLOGY--The student will be able to:

25.01 Describe five applications of lasers.
25.02 Perform laser experiments demonstrating knowledge of:
25.02.01 Characteristics of laser light.
25.02.02 Characteristics of light waves.
25.03 List the safety precautions that one observes when working with a laser.
25.04 Assemble, operate and identify the parts of a laser optics system.
25.05 Demonstrate the use of a laser to do measurements, transmit data, and monitor.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601710
Course Title: Technology Studies III
Course Credit: 1

COURSE DESCRIPTION: This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work station within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

- 03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.

08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

26.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF MECHANICAL SYSTEMS--The student will be able to:

26.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to mechanical systems.
26.02 Diagram a mechanical system incorporating input, monitoring, controlling, output, and feedback.
26.03 Report on the six simple machines.
26.04 Identify various parts of a mechanical system.
26.05 Assemble and operate the six simple machines.
26.06 Use the problem-solving model - perform activities using combinations of the six simple machines to meet the described design criteria.
26.07 Demonstrate the use of a computer to control a mechanical system.

27.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF FLUID SYSTEMS--The student will be able to:

27.01 Define the concepts of force, work rate, resistance, energy and power as they relate to fluid systems.
27.02 Diagram a fluid system incorporating input, monitoring, controlling, output, and feedback.
27.03 Diagram a fluid power system incorporating input, monitoring, controlling, output, and feedback.

27.04 Use the problem-solving model - perform activities using fluid power components to meet the described design criteria.
27.05 Assemble, operate, and identify the parts of a fluid power system.
27.06 Report on the applications of fluid power used in technology.
27.07 Demonstrate the use of a computer to control a fluid power system.

28.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ELECTRICAL SYSTEMS--The student will be able to:

28.01 Define the concepts of force, work, rate resistance, energy, and power as they relate to electrical systems.
28.02 Diagram an electrical system incorporating input, monitoring, controlling, output and feedback components.
28.03 Explain what a system and sub-system is.
28.04 Describe types of electrical outputs of heat, light, temperature, sound, magnetism, and electrical voltage.
28.05 Describe types of electrical inputs of light, temperature, sound, magnetism, moisture, movement, pressure, and voltage.
28.06 Use the problem-solving model - perform activities using electrical system components to meet the describe design criteria.
28.07 Demonstrate the use of a computer to control an electrical system.

29.0 DEMONSTRATE THE USE OF FIBER OPTICS--The student will be able to:

29.01 Report on the applications of fiber optics in technology.
29.02 Use the problem-solving model - perform activities using fiber optics to meet the described design criteria.
29.03 Assemble, operate, and identify the parts of a fiber optics systems.

30.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--The student will be able to:

30.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
30.02 Use the problem-solving model - perform activities using integrated systems to meet the described design criteria.
30.03 Assemble, operate, and identify the parts of integrated systems.
30.04 Demonstrate the use of a computer to control an integrated system composed of mechanical, fluid and electrical components.

31.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A TECHNOLOGICAL MATERIAL OR PROCESS--The student will be able to:

31.01 Identify a problem.
31.02 State a need to research the problem.
31.03 Form a hypothesis about the problem.
31.04 Plan the procedures for researching the problem.
31.05 Conduct the research following the planned procedures.
31.06 Present the research findings in a seminar.
31.07 State conclusions based on the research findings.