

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Advanced Applications in Technology
Program Type: Practical Arts
Occupational Area: Technology Education
Program Numbers: 8601900
CIP Number: 08210200CP
Grade Level: Secondary 9-12, & 30, 31
Standard Length: Maximum 3 Credits
Facility Design Code: Any Appropriate Technology Education Facility
CTSO: Florida Technology Student Association (FL-TSA)
Certification: INDUS ARTS @4 @6, I ART-TEC 1 @2,
 GEN SHOP @4, GASENG RPR @7 G,
 TRANSPORT @4, DIESEL MECH @7 G,
 AIR MECH @7 G, TEC MECH @7 G,
 METALS @4, ELECTRICAL @4 @7 G,
 ELECTRONIC @7 G, GRAPH ARTS @4,
 DRAFTING @7 G, PRINTING @7 G,
 TEC CONSTR @7 G, WOODWORK @4,
 BLDG CONST @7 G, CARPENTRY @7 G,
 AUTO MECH @7 G, AUTO IND @7 G.

- I. **PURPOSE:** The purpose of this course is to provide students with the opportunity, to develop a 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 of the knowledge previously learned, not only in technology education but across the curriculum.

To enroll in Advanced Applications in Technology, a student must have:

1. Completed three credits of a Technology Education program.
2. Received permission of the supervising Technology Education Instructor and or Faculty Team.

This Advanced Applications in Technology course may be taken by a student for one or more semesters. A student may earn multiple credits in this course.

- II. **PROGRAM STRUCTURE:** The Advanced Applications in Technology must include the following components:

PREPROJECT PLANNING CONFERENCE: The student, teacher, and team members must participate in a preproject planning conference, which is essential to designing advanced learning experiences that are appropriate for each individual's learning needs and career interests. It is critical that all parties involved understand and agree on time schedules, expectations, advanced learning applications and evaluation criteria.

PROJECT CRITERIA: The following criteria shall be met when choosing the Advanced Applications in Technology Project:

1. The project must allow experiences that utilize both skills and knowledge directly related to the student's career interests and

the Technology Education program in which the student is enrolled or has completed.

2. The project must provide opportunities for rotation through a wide variety of advanced applications in technology tasks.
3. The project must provide a safe and ethically sound environment with up-to-date facilities and equipment.
4. Each student must maintain a journal with daily entries describing:
 - a) Time spent on the project (log in and log out)
 - b) Description of the activity for the period(s)
 - c) Materials/equipment/fixtures used
 - d) Problems identified
 - e) Possible solutions to problems identified
 - f) Work accomplished
 - g) Solutions attempted
 - h) Solutions that failed
 - I) Which led to a new problem statement
 - J) Video or Still Images of the project as it progresses.
 - K) Plans, sketches, drawings, patterns, fixtures or other documentation of components manufactured or constructed
5. Each student must maintain a portfolio of the project to include:
 - a) Bibliography of all research materials accessed.
 - b) A written research paper describing the background information the project is to be based on.
 - c) A Laboratory Report to include:
 1. A clear statement of the project
 2. A hypothesis or description of the area of investigation.
 3. A written procedure of each activity as it is accomplished.
 4. List of materials used in each activity.
 5. Data recovered in the form of a data table, charts graphs.
 6. Conclusion
 7. Bibliography
 - d) Safety concerns and procedures to be followed.
 - e) An abstract.
- 6) A progress report at mid-term will be given to each student to include a written research paper, that describes the area of investigation and an oral presentation to the remainder of the class and instructor or supervising faculty team, on the progress of the project, and all work accomplished. The progress report will be the basis for the mid-term evaluation grade.
- 7) A final oral progress report presentation at the end of the course will be given by each student or team that includes:
 - a) a review of the portfolio and the journal,
 - b) a description of the experiment, process or activity
 - c) results
 - d) problems identified and solutions that worked or did not work,
 - e) and a conclusion.
- 8) The final progress report will be the basis for the final exam

evaluation grade.

- 9) When offered for multiple credits, the student should have varied learning experiences in order to provide maximum education exposure.
- 10) The course may be supervised by a faculty team consisting of the members of the faculty who will be granting the multiple credit(s) if that is the case.

PROJECT EXPERIENCE: This component shall provide a match between the student's career interests and a project based situation that will provide exposure to the broad aspects of the selected industry. The assigned tasks should allow a progression and rotation through experiences requiring a variety of knowledge, skills and abilities at increasingly higher levels related to the student's Technology Education studies and career interests.

EXPERIENCE PLAN: A project experience plan must be developed and implemented for each student based on the curriculum frameworks of the Technology Education program. The project experience plan must outline learning objectives, methods of learning, activities/responsibilities, time required, student performance standards, provision for supervision, and method(s) of student evaluation. The project learning experience plan must be signed by the student and teacher.

SUPERVISION: Teacher-coordinators of the Advanced Applications in Technology project must monitor and support learning. Students must also be evaluated a minimum of once per grading period by the teacher-coordinator. The evaluation should assess how well the student is progressing toward goals established by the student teacher-coordinator. Portfolio assessment, orchestrated by the teacher-coordinator, is a recommended method of student assessment.

- 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>.

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 student's Individual Educational Plan (IEP).

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- IV. **INTENDED OUTCOMES:** After successfully completing this course the student will be able to perform the following:

01. Complete a skills inventory.

02. Demonstrate acceptable work values.
03. Demonstrate the ability to identify and solve problems.
04. Successfully work as a member of a team.
05. Manage time according to a plan.
06. Keep acceptable records of progress, problems and solutions.
07. Plan, organize and carry out a project plan.
08. Manage resources.
09. Use tools, materials, and process in an appropriate and safe manner.
10. Demonstrate an understanding of the scientific process.
11. Demonstrate appropriate scientific content related to the project.
12. Demonstrate appropriate mathematics content related to the project.
13. Carry out a research assignment, and document the results of research efforts.
14. Use presentation skills, and appropriate media to describe the progress, results and outcome of the experience.
15. Demonstrate competency in the area of expertise related to the technology education program previously completed, that this project is based upon.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Advanced Applications in Technology
Secondary Number: 8601900

- 01.0 COMPLETE A SAFETY SKILLS INVENTORY--The student will be able to:
 - 01.01 Practice safety procedures while enrolled in this course.
 - 01.02 Demonstrate an understanding of safety and general policies and procedures.

- 02.0 DEMONSTRATE ACCEPTABLE PROJECT VALUES--The student will be able to:
 - 02.01 Maintain a positive relationship with peers and mentors.
 - 02.02 Demonstrate adaptive self-management skills.
 - 02.03 Rotate through a wide variety of increasingly responsible experiences.
 - 02.04 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

- 03.0 DEMONSTRATE THE ABILITY TO IDENTIFY AND SOLVE PROBLEMS--The student will be able to:
 - 03.01 Prepare a design brief for each step in the project plan.
 - 03.02 Identify possible solutions for each design brief.
 - 03.03 Complete research and development activities associated with each design brief.
 - 03.04 Document problems as they arise.
 - 03.05 Prepare a problem statement for any activity that is not successful.
 - 03.06 Identify possible solutions for the new problem statement.
 - 03.07 Continue the R & D process until workable solutions are found to each problem stated.

- 04.0 SUCCESSFULLY WORK AS A MEMBER OF A TEAM--The student will be able to:
 - 04.01 Accept responsibility for specific tasks in a given situation.
 - 04.02 Document progress, and provide feedback on work accomplished in a timely manner.
 - 04.03 Complete assigned tasks in a timely and professional manner.
 - 04.04 Reassign responsibilities when the need arises.
 - 04.05 Complete daily tasks as assigned on one's own initiative.

- 05.0 MANAGE TIME ACCORDING TO A PLAN--The student will be able to:
 - 05.01 Set realistic time frames and schedules.
 - 05.02 Keep a written time sheet of work accomplished on a daily basis.
 - 05.03 Meet goals and objectives set by the team.
 - 05.04 Identify individual priorities.
 - 05.05 Complete a weekly evaluation of accomplishments, and reevaluate goals, objectives and priorities as needed.

- 06.0 KEEP ACCEPTABLE RECORDS OF PROGRESS PROBLEMS AND SOLUTIONS--The student will be able to:
 - 06.01 Develop a record keeping system in the form of a log book to record daily progress.
 - 06.02 Use a project journal to identify problem statement

- 06.03 Develop a portfolio of work accomplished to include design drawings, research, drawings and plans, models, mock-ups and prototypes.
- 07.0 PLAN, ORGANIZE, AND CARRY OUT A PROJECT PLAN--The student will be able to:
 - 07.01 Determine the scope of a project.
 - 07.02 Organize the team according to individual strengths.
 - 07.03 Assign specific tasks within a team.
 - 07.04 Determine project priorities.
 - 07.05 Identify required resources.
 - 07.06 Plan research, development, design, construction and manufacturing activities as required.
 - 07.07 Carry out the project plan to successful completion.
- 08.0 MANAGE RESOURCES--The student will be able to:
 - 08.01 Identify required resources for each stage of the project plan.
 - 08.02 Determine the methods needed to acquire needed resources.
 - 08.03 Demonstrate good judgment in the use of resources.
 - 08.04 Recycle and reuse resources where appropriate.
 - 08.05 Demonstrate an understanding of proper legal and ethical waste disposal.
- 09.0 USE TOOLS, MATERIALS, AND PROCESSES IN AN APPROPRIATE AND SAFE MANNER--The student will be able to:
 - 09.01 Identify the proper tool for a given job.
 - 09.02 Use tools and machines in a safe manner.
 - 09.03 Adhere to laboratory or job site safety rules and procedures.
 - 09.04 Identify the application of processes appropriate to the task at hand.
 - 09.05 Identify materials appropriate to their application.
- 10.0 DEMONSTRATE AN UNDERSTANDING OF THE SCIENTIFIC PROCESS--The student will be able to:
 - 10.01 State a problem clearly.
 - 10.02 Identify and write a hypothesis.
 - 10.03 Develop a materials list.
 - 10.04 Develop a step by step procedure.
 - 10.05 Follow a written procedure.
 - 10.06 Record data.
 - 10.07 Make a conclusion based on results, observations and data.
 - 10.08 Document progress using a laboratory report.
 - 10.09 Write an abstract.
- 11.0 DEMONSTRATE APPROPRIATE SCIENTIFIC CONTENT RELATED TO THE PROJECT--The student will be able to:
 - 11.01. Document how all matter has observable, measurable properties.
 - 11.02. Apply the basic principles of atomic theory.
 - 11.03. Determine how energy may be changed in form with varying efficiency.
 - 11.04. Document the interaction of matter and energy.
 - 11.05. Document how types of motion may be described, measured, and predicted.
 - 11.06. Demonstrate how types of force that act on an object and the effect of that force can be described, measured, and predicted.
 - 11.07. Demonstrate how science, technology, and society are interwoven and interdependent.

- 12.0 DEMONSTRATE APPROPRIATE MATHEMATICS CONTENT RELATED TO THE PROJECT--The student will be able to:
- 12.01. Identify different ways numbers are represented and used.
 - 12.02. Demonstrate proper use of the number systems.
 - 12.03. Develop effective operations on numbers and the relationships among these operations.
 - 12.04. Use estimation in problem solving and computation.
 - 12.05. Apply theories used in the solution to numbers.
 - 12.06. Use quantities in the real world and uses the measures to solve problems.
 - 12.07. Compare data within systems of measurement (both standard/nonstandard and metric/customary).
 - 12.08. Solve the problem mathematical using length, time, weight/mass, temperature, money, perimeter, area, and volume, and estimates the effects of measurement errors on calculations.
 - 12.09. Apply appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.
 - 12.10. Describe, draw, Identify, and analyzes two-and three-dimensional shapes.
 - 12.11. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.
 - 12.12. Coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.
 - 12.13. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.
 - 12.14. Uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.
 - 12.15. Uses the tools of data analysis for managing information.
 - 12.16. Identify patterns and makes predictions from an orderly display of data using concepts of probability and statistics.
 - 12.17. Uses statistical methods to make inferences and valid arguments about real-world situations.
- 13.0 CARRY OUT A RESEARCH ASSIGNMENT, AND DOCUMENT THE RESULTS OF RESEARCH EFFORTS--The student will be able to:
- 13.01 Identify the basic research needed to develop the project plan.
 - 13.02 Identify available resources for completing background research required in the project plan.
 - 13.03 Demonstrate the ability to locate resource materials in a library, data base, internet and other research resources.
 - 13.04 Demonstrate the ability to organize information retrieval.
 - 13.05 Demonstrate the ability to prepare a topic outline.
 - 13.06 Write a draft of the research report.
 - 13.07 Edit and proof the research report. Use proper form for a bibliography, footnotes, quotations and references.
 - 13.08 Prepare an electronically composed research paper in proper form.
 - 13.09 Conduct a research experiment.
 - 13.10 Complete a laboratory report on the experiment, documenting results, data and observations.
 - 13.11 Prepare a display of the experiment to include a title, problem statement, hypothesis, material list, procedure, results and observations, data tables and or graphs and charts, illustrations of the procedure, models, mock ups, devises or fixtures required, conclusion safety statements and an abstract.

- 14.0 USE PRESENTATION SKILLS, AND APPROPRIATE MEDIA TO DESCRIBE THE PROGRESS, RESULTS AND OUTCOMES OF THE EXPERIENCE--The student will be able to:
 - 14.01 Prepare a multi-media presentation on the completed project.
 - 14.02 Make an oral presentation, using multi-media materials.
 - 14.03 Review the presentation, and make changes in the delivery method(s) to improve presentation skills.

- 15.0 DEMONSTRATE COMPETENCY IN THE AREA OF EXPERTISE RELATED TO THE TECHNOLOGY EDUCATION PROGRAM PREVIOUSLY COMPLETED THAT THIS PROJECT IS BASED UPON--The student will be able to:
 - 15.01 Demonstrate a mastery of the content of the selected subject area.
 - 15.02 Demonstrate the ability to use related technological tools, materials and processes related to the specific program area.
 - 15.03 Demonstrate the ability to apply the knowledge, experience and skill developed in the previous program completion to the successful completion of this demonstration.
 - 15.04 Demonstrate the acquisition of additional knowledge, skill and experience in one area of the selected field of study beyond the performance standards of the initial program standards.