2010 Mississippi Curriculum Framework

Postsecondary Aviation Maintenance Technology

(Program CIP: 47.0607 – Airframe Mechanics and Aircraft Maintenance Technology/Technician)

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Standards in this document are based on information from the following organizations:

Federal Aviation Regulations

Federal Aviation Regulations, Part 147, Aviation Maintenance Technician Schools, http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f4866fb822b1dbcc615562678afed80b&rgn=div5&view=text&node=14:3.0.1.1.6&idno=14

Related Academic Standards

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Preface

Aviation Maintenance Technology Research Synopsis

Articles, books, Web sites, and other materials listed at the end of each course were considered during the revision process. *Aircraft Maintenance Technology* and *Light Plane Maintenance* were especially useful in providing insight into trends and issues in the field. These references are suggested for use by instructors and students during the study of the topics outlined.

Industry advisory team members from colleges throughout the state were asked to give input related to changes to be made to the curriculum framework. Specific comments related to soft skills needed in this program include a positive attitude, attention to detail, and start and complete assignments. Occupational-specific skills stated include fundamentals, identification of basic parts, operation, and troubleshooting. Safety practices emphasized included FAA rules and regulations along with general shop policies and airport procedures.

Instructors from colleges throughout the state were also asked to give input on changes to be made to the curriculum framework. Changes suggested for the curriculum include adding two courses: Special Problems and Supervised Work Experience.

Needs of the Future Workforce

Aviation Maintenance is projected to have about average growth over the projection decade (2009–2019) in Mississippi, 11%, and the United States, 12% (EMSI, 2009). Competition will be greatest at large airports and for major airlines that offer higher pay and greater benefits (U.S. Bureau of Labor Statistics, 2010). Job prospects will be best for those with certification from FAA-accredited programs, those with job experience, and those who seek employment at FAA repair stations, in general aviations, and at regional airports. Aviation maintenance workers held over 133,000 jobs in 2009 in the United States (EMSI, 2009). Most workers were aircraft mechanics and service technicians. Approximately 13% were avionics technicians (U.S. Bureau of Labor Statistics, 2010). Employment is concentrated in a few industries. Nearly half of aviation maintenance workers work in air transportation and support. Over 20% of aviation maintenance workers work in aerospace manufacturing, while 15% work for the federal government (U.S. Bureau of Labor Statistics, 2010).

Aviation Maintenance Employment Projections and Earnings

Region	2009 Jobs	2019 Jobs	Change	% Change	Current Median Hourly Earnings
Regional Total	842	933	91	11%	$21.86
National Total	133,871	150,156	16,285	12%	$24.60

Source: EMSI Complete Employment - 4th Quarter 2009

Curriculum
The following national standards were referenced in each course of the curriculum:

- CTB/McGraw-Hill LLC *Tests of Adult Basic Education, Forms 7 and 8* Academic Standards *OR* Mississippi Department of Education Subject Area Testing Program Academic Standards
- 21st Century Skills
- Federal Aviation Regulations, Part 147, Aviation Maintenance Technician Schools (Airframes and Power Plants)

Industry and instructor comments, along with current research, were considered by the curriculum revision team during the revision process, and changes were made as needed and appropriate. Many of the skills and topics noted in the research were already included in the curriculum framework. Specific changes made to the curriculum at the April 25, 2010, curriculum revision meeting include the following:

- Competencies and objectives were reviewed to ensure accuracy and appropriateness.
- Specific additions or deletions
- The Recommended Tools and Equipment list was updated.

Assessment
Students will be assessed using the Federal Aviation Regulations, Part 147, Aviation Maintenance Technician Tests (Airframes and Power Plants).

Professional Learning
It is suggested that instructors participate in professional learning related to the following concepts:

- How to use the program Blackboard site
- Differentiated instruction – To learn more about differentiated instruction, please go to http://www.paec.org/teacher2teacher/additional_subjects.html and click on Differentiated Instruction. Work through this online course, and review the additional resources.

Articulation
Articulation credit from Secondary Basic Electronics to Postsecondary Aviation Maintenance Technology will be awarded beginning with the fall semester of 2010. Courses to be articulated include APT 1123 - Aviation Electricity I.

Articulated Secondary Course	Articulated Postsecondary Course
Basic Electronics (Program CIP: 47.0101)	APT1123 - Aviation Electricity I

Statewide and FAA Guidelines on Articulated Credit

Eligibility

- To be eligible for articulated credit, a student must:
  - Complete the articulated secondary vocational program, and
  - Score 80% or higher on the Mississippi Career Planning and Assessment System, Second Edition (MS-CPAS2) in his or her secondary program of study.
- To be awarded articulated credit, a student must:
  - Comply and abide by Federal Aviation Regulation, 14 CFR Part 147, Subpart C;

- Complete application for articulated credit at the community or junior college;
- Enroll in the community or junior college within 18 months of graduation; and
- Successfully complete 12 non-developmental career–technical or academic credit hours in the corresponding articulated postsecondary career–technical program of study.

How MS-CPAS2 will be documented

- The Research and Curriculum Unit of Mississippi State University will provide the State Board for Community and Junior Colleges (SBCJC) a list of all secondary career and technical education (CTE) students scoring at or above the 80 percentile for the articulated programs.
- The SBCJC will forward the list of students eligible for articulated credit to the colleges.

Transcripting of Articulated Credit

- Students must complete 12 non-developmental career–technical or academic credit hours in the articulated postsecondary career–technical program of study before the articulated credit is transcripted.
- No grade will be given on the transcript for articulated courses; only hours granted will be transcripted, thus resulting in no change in quality points.

Time Limit

- MS-CPAS2 scores will be accepted to demonstrate competencies for up to 18 months after high school graduation.

Cost

- No costs will be assessed on hours earned through articulated credit.

Foreword

As the world economy continues to evolve, businesses and industries must adopt new practices and processes in order to survive. Quality and cost control, work teams and participatory management, and an infusion of technology are transforming the way people work and do business. Employees are now expected to read, write, and communicate effectively; think creatively, solve problems, and make decisions; and interact with each other and the technologies in the workplace. Vocational–technical programs must also adopt these practices in order to provide graduates who can enter and advance in the changing work world.

The curriculum framework in this document reflects these changes in the workplace and a number of other factors that impact local vocational–technical programs. Federal and state legislation calls for articulation between high school and community college programs, integration of academic and vocational skills, and the development of sequential courses of study that provide students with the optimum educational path for achieving successful employment. National skills standards, developed by industry groups and sponsored by the U.S. Department of Education and Labor, provide vocational educators with the expectations of employers across the United States. All of these factors are reflected in the framework found in this document.

Referenced throughout the courses of the curriculum are the 21st Century Skills, which were developed by the Partnership for 21st Century Skills, a group of business and education organizations concerned about the gap between the knowledge and skills learned in school and those needed in communities and the workplace. A portion of the 21st Century Skills addresses learning skills needed in the 21st century, including information and communication skills, thinking and problem-solving skills, and interpersonal and self-directional skills. The need for these types of skills has been recognized for some time, and the 21st Century Skills are adapted in part from the 1991 report from the U.S. Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). Another important aspect of learning and working in the 21st century involves technology skills, and the International Society for Technology in Education, developer of the National Educational Technology Standards (NETS), was a strategic partner in the Partnership for 21st Century Skills.

Each postsecondary program of instruction consists of a program description and a suggested sequence of courses that focus on the development of occupational competencies. Each vocational–technical course in this sequence has been written using a common format, which includes the following components:

- Course Name – A common name that will be used by all community and junior colleges in reporting students

- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students

- Classification – Courses may be classified as the following:
    - Vocational–technical core – A required vocational–technical course for all students

  - Area of concentration (AOC) core – A course required in an area of concentration of a cluster of programs
  - Vocational–technical elective – An elective vocational–technical course
  - Related academic course – An academic course that provides academic skills and knowledge directly related to the program area
  - Academic core – An academic course that is required as part of the requirements for an associate's degree

- Description – A short narrative that includes the major purpose(s) of the course and the recommended number of hours of lecture and laboratory activities to be conducted each week during a regular semester

- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course

- Corequisites – A listing of courses that may be taken while enrolled in the course

- Competencies and Suggested Objectives – A listing of the competencies (major concepts and performances) and of the suggested student objectives that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
  - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
  - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
  - Activities that implement components of the Mississippi Tech Prep initiative, including integration of academic and vocational–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary vocational–technical programs
  - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas

- Sequencing of the course within a program is left to the discretion of the local district. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.

- Programs that offer an Associate of Applied Science degree must include a minimum 15-semester-credit-hour academic core. Specific courses to be taken within this core are to be determined by the local district. Minimum academic core courses are as follows:
    - 3 semester credit hours — Math/Science Elective
    - 3 semester credit hours — Written Communications Elective
    - 3 semester credit hours — Oral Communications Elective
    - 3 semester credit hours — Humanities/Fine Arts Elective
    - 3 semester credit hours — Social/Behavioral Science Elective

  It is recommended that courses in the academic core be spaced out over the entire length of the program so that students complete some academic and vocational–technical courses each semester. Each community or junior college has the discretion to select the actual courses that are required to meet this academic core requirement.

- In instances in which secondary programs are directly related to community and junior college programs, competencies and suggested objectives from the high school programs are listed as baseline competencies. These competencies and objectives reflect skills and knowledge that are directly related to the community and junior college vocational–technical program. In adopting the curriculum framework, each community or junior college is asked to give assurances that:
    - Students who can demonstrate mastery of the baseline competencies do not receive duplicate instruction, and
    - Students who cannot demonstrate mastery of this content will be given the opportunity to do so.

- The roles of the baseline competencies are to:
    - Assist community and junior college personnel in developing articulation agreements with high schools, and
    - Ensure that all community and junior college courses provide a higher level of instruction than their secondary counterparts.

- The baseline competencies may be taught as special introduction courses for 3 to 6 semester hours of institutional credit, which will not count toward associate degree requirements. Community and junior colleges may choose to integrate the baseline competencies into ongoing courses in lieu of offering the introduction courses or may offer the competencies through special projects or individualized instruction methods.

- Technical elective courses have been included to allow community colleges and students to customize programs to meet the needs of industries and employers in their area.

In order to provide flexibility within the districts, individual courses within a framework may be customized by:

- Adding new competencies and suggested objectives.
- Revising or extending the suggested objectives for individual competencies.
- Integrating baseline competencies from associated high school programs.

- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the State Board for Community and Junior Colleges [SBCJC] of the change).

In addition, the curriculum framework as a whole may be customized by:

- Resequencing courses within the suggested course sequence.
- Developing and adding a new course that meets specific needs of industries and other clients in the community or junior college district (with SBCJC approval).
- Utilizing the technical elective options in many of the curricula to customize programs.

Table of Contents

Program Description

Aviation Maintenance Technology is an instructional program that prepares individuals to inspect, repair, service, and overhaul aircraft engine components and systems. This program is designed to prepare the student for the Federal Aviation Administration exams for certification as an Aircraft Maintenance Technician.

Industry standards referenced are from the Federal Aviation Regulations, Part 147, Aviation Maintenance Technician Schools (Airframes and Power Plants).

PROGRAM OPTIONS

AVIATION MAINTENANCE TECHNOLOGY 2-YEAR CERTIFICATE OPTION

After completion of the 2-year course of study, a student will receive a 2-year certificate in Aviation Maintenance.

ASSOCIATE OF APPLIED SCIENCE DEGREE OPTION

A student may receive the Associate of Applied Science Degree in Aviation Maintenance Technology by completion of the 2-year certificate program **AND** 15 semester hours of academic electives including the following:

3 sch Math/Science
3 sch Written Communications
3 sch Oral Communications
3 sch Humanities/Fine Arts
3 sch Social/Behavioral Science

___
15 sch total

Suggested Course Sequence*
Aviation Maintenance Technology

FIRST YEAR

First Semester

		Lecture	Lab	Total Clock Hours
3 sch	Aviation Applied Sciences (APT 1113)	42	57	99
3 sch	Aviation Electricity I (APT 1123)	33	40	73
4 sch	Aviation Materials and Processes (APT 1134)	45	65	110
2 sch	Aircraft Servicing and Weight-and-Balance (APT 1142)	28	46	74
3 sch	Maintenance Forms and Records (APT 1153)	27	41	68
2 sch	Reciprocating Engine Theory (APT 1162)	37	0	37
17 sch		212	249	461

Second Semester

		Lecture	Lab	Total Clock Hours
3 sch	Reciprocating Engine Overhaul and Inspection (APT 1213)	28	92	120
2 sch	Turbine Engine Theory (APT 1222)	37	0	37
3 sch	Turbine Engine Overhaul and Inspection (APT 1233)	28	92	120
1 sch	Power Plant Conformity and Airworthiness Inspection (APT 1241)	14	18	32
4 sch	Lubrication and Fuel Metering Systems (APT 1254)	55	68	123
2 sch	Induction, Cooling, and Exhaust Systems (APT 1262)	27	52	79
15 sch		189	322	511

SECOND YEAR

First Semester

		Lecture	Lab	Total Clock Hours
4 sch	Aviation Electricity II (APT 2114)	55	67	122
3 sch	Propellers and Power Plant Review (APT 2123)	36	45	81
5 sch	Structures I (APT 2135)	43	131	174
3 sch	Structures II (APT 2143)	42	59	101
15 sch		176	302	478

Second Semester

		Lecture	Lab	Total Clock Hours
2 sch	Aircraft Controls (APT 2212)	17	42	59
2 sch	Aviation Electricity III (APT 2222)	28	41	69
2 sch	Hydraulic and Pneumatic Power Systems (APT 2232)	18	42	60
3 sch	Landing Gear and Protection Systems (APT 2243)	32	42	74
1 sch	Environment Control (APT 2251)	14	24	38
3 sch	Aircraft Instrumentation Systems (APT 2263)	42	42	84
1 sch	Aircraft Fuel Systems (APT 2271)	18	18	36
2 sch	Airframe Inspection and Review (APT 2282)	14	42	56
16 sch		183	293	476

* Students who lack entry-level skills in mathematics, English, science, and so forth will be provided related studies.

NOTES

1. Local circumstances may require scheduling in a different sequence than presented here.
2. This instructional program must be presented in compliance with Federal Aviation Regulations, Part 147, Aviation Maintenance Technician Schools, effective September 28, 1992. This requires that hours of lecture and laboratory presented in the course descriptions be adjusted to demonstrate performance of the student contact hours required by the Federal Aviation Regulations (FAR). The current FAR requires a minimum of 1,900 clock hours of instruction. The suggested curriculum consists of 1,926 clock hours of combined instructional and testing time.
3. Each objective has been coded to reflect the teaching levels as found in the FAR Part 147, Appendix A. The following teaching levels apply:
   (1) Level 1. This level generally refers to classroom instruction and does not require practical application. Teaching aids or instructional equipment may include charts, books, diagrams, or other visual teaching aids. If an aircraft maintenance technician school chooses to teach Level 1 courses incorporating actual components, the components do not have to be operational.
   (2) Level 2. This teaching level requires some hands-on manipulative skills and their accompanying actual or simulated components/equipment but may be taught primarily in the classroom environment.
   (3) Level 3. This teaching level requires hands-on skills and sufficient and appropriate instructional aids to train the student to develop manipulative skills sufficient to simulate return to service mechanical skills. At this level, the teaching aids must be similar to or be the actual items of equipment on which the student is expected to develop required skill levels. No Level 3 subject can be taught solely by lecture in the classroom; the appropriate training aids and hands-on experience must be used.
4. The minimum passing grade on any exam is 70%.

Aviation Maintenance Technology Courses

Course Name: Aviation Applied Science

Course Abbreviation: APT 1113

Classification: Vocational–Technical Core

Description: General aviation maintenance practices including orientation to aviation, aircraft maintenance safety procedures, aviation mathematics, aviation physics, and aircraft drawings. (3 sch: 42-clock-hr lecture, 57-clock-hr lab)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Identify and apply aviation maintenance safety procedures. APT1 a. Identify school policies and regulations. (1) (DOK1) b. Apply aviation maintenance safety procedures. (2) (DOK1) c. Demonstrate procedures for safe handling, storage, and disposal of hazardous materials found in aviation maintenance. (2) (DOK1)
2. Perform aviation mathematics. APT1 a. Extract roots, and raise numbers to a given power. (3) (DOK1) b. Determine areas and volumes of various geometrical shapes. (3) (DOK1) c. Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers. (3) (DOK1) d. Solve ratio, proportion, and percentage problems. (3) (DOK1)
3. Apply aviation physics. APT1 a. Use the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight. (2) (DOK1)
4. Prepare and interpret aircraft drawings. APT1 a. Use drawings, symbols, and schematic diagrams. (2) (DOK1) b. Draw sketches of repairs and alterations. (3) (DOK1) c. Use blueprint information. (3) (DOK1) d. Use graphs and charts. (3) (DOK1)

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Aviation Electricity

Course Abbreviation: APT 1123

Classification: Vocational–Technical Core

Description: Theory and application of direct and alternating current distribution and utilization of voltage. Practical application of Ohm's law. (3 sch: 33-clock-hr lecture, 40-clock-hr lab)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Demonstrate procedures to measure electrical values, calculate Ohm's law, and apply these principles to alternate and direct current distribution.[APT1, APT2, APT3] a. Measure capacitance and inductance. (2) [(DOK1)] b. Calculate and measure electrical power. (2) [(DOK1)] c. Measure voltage, current, resistance, continuity, and leakage. (3) [(DOK1)] d. Determine the relationship of voltage, current, and resistance in electrical circuits. (3) [(DOK1)] e. Read and interpret electrical circuit diagrams. (3) [(DOK1)] f. Inspect and service batteries. (3) [(DOK1)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
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M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents

M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Aviation Materials and Processes

Course Abbreviation: APT 1134

Classification: Vocational–Technical Core

Description: Materials and processes used in the construction and repair of aircraft and components, fluid lines and fittings, and corrosion protection. (4 sch: 45-clock-hr lecture, 65-clock-hr lab)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Identify materials and processes used in construction and repair of aircraft and components.[APT1 APT2, APT3] a. Identify and select appropriate nondestructive testing methods. (1) [(DOK1)] b. Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections. (2) [(DOK1)] c. Perform basic heat-treating processes. (1) [(DOK1)] d. Identify and select aircraft hardware and materials. (3) [(DOK1)] e. Inspect and check welds. (3) [(DOK2)] f. Perform precision measurements. (3) [(DOK2)]
2. Maintain aircraft fluid lines and fittings.[APT1, APT2, APT3] a. Inspect and repair rigid and flexible fluid lines and fittings. (3) [(DOK3)] b. Fabricate and install rigid and flexible fluid lines and fittings. (3) [(DOK3)]
3. Perform procedures for aircraft cleaning and corrosion control.[APT1, APT2, APT3] a. Identify and select cleaning materials. (3) [(DOK1)] b. Inspect, identify, remove, and treat aircraft corrosion, and perform aircraft cleaning. (3) [(DOK3)]

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A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
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L5 Punctuation (comma, semicolon)
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S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
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Course Name: Aircraft Servicing and Weight and Balance

Course Abbreviation: APT 1142

Classification: Vocational–Technical Core

Description: Aircraft ground operation and servicing and weight-and-balance checks and records. (2 sch: 28-clock-hr lecture, 46-clock-hr lab)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Perform aircraft ground operation and servicing.[APT1, APT2, APT3] a. Start, ground operate, move, service, and secure aircraft and identify typical ground operation hazards. (2) [(DOK2)] b. Identify and select fuels. (2) [(DOK1)]
2. Perform aircraft weight and balance checks and record data.[APT1, APT2, APT3] a. Weigh aircraft. (2) [(DOK1)] b. Perform complete weight-and-balance check and record data. (3) [(DOK2)]

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Federal Aviation Administration. (n.d.). Retrieved May 10, 2006, from http://www.faa.gov

King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Maintenance Forms and Records

Course Abbreviation: APT 1153

Classification: Vocational–Technical Core

Description: Maintenance publications, maintenance forms and records, and mechanic privileges and limitations. (3 sch: 27-clock-hr lecture, 41-clock-hr lab)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Read and interpret aircraft maintenance publications.[APT1, APT2, APT3] a. Read, comprehend, and apply information contained in Federal Aviation Administration (FAA) and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations (FAR) air worthiness directives and advisory material. (3) [(DOK1)] b. Read technical data. (3) [(DOK1)]
2. Read and interpret aircraft maintenance forms and records.[APT1, APT2, APT3] a. Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records. (3) [(DOK3)] b. Complete required maintenance forms, records, and inspection reports. (3) [(DOK1)]
3. Apply aircraft mechanic privileges and limitations.[APT1, APT2, APT3] a. Exercise mechanic privileges within the limitations prescribed by the FAR. (3) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)

M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Federal Aviation Administration. (n.d.). Retrieved May 10, 2006, from http://www.faa.gov

King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Reciprocating Engine Theory

Course Abbreviation: APT 1162

Classification: Vocational–Technical Core

Description: Theory and principles of operation of reciprocating engines. (2 sch: 37-clock-hr lecture)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Explain the theory of reciprocating engine operation. APT1, APT3
a. Identify the types of reciprocating engines. (1) (DOK1)
b. Identify parts of air-cooled aircraft engines. (1) (DOK1)
c. Describe different types of crankshafts and connecting rods. (1) (DOK1)
d. Classify engine types by cylinder arrangements and methods of cooling. (1) (DOK1)
e. Describe the different types of propeller reduction gearing. (1) (DOK1)
f. Explain volumetric efficiency. (1) (DOK2)
g. Interpret a valve timing chart. (1) (DOK2)
h. Determine the firing order of a reciprocating engine. (1) (DOK1)
i. Describe the four strokes and five events in the Otto cycle. (1) (DOK1)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents

M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Reciprocating Engine Overhaul and Inspection

Course Abbreviation: APT 1213

Classification: Vocational–Technical Core

Description: Actual overhaul of reciprocating engines. Included is a study of the procedures and acceptable techniques used in engine disassembly, inspection, repair, and reassembly. (3 sch: 28-clock-hr lecture, 92-clock-hr lab)

Pre/Corequisites: Reciprocating Engine Theory (APT 1162)

Competencies and Suggested Objectives
1. Overhaul and inspect reciprocating engines.[APT1, APT3] a. Describe the principles of inspection and repair of radial engines. (1) [(DOK1)] b. Overhaul reciprocating engine. (2) [(DOK2)] c. Inspect, check, service, and repair opposed and radial engines and reciprocating engine installations. (3) [(DOK3)] d. Install, troubleshoot, and remove reciprocating engines. (3) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)

A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Turbine Engine Theory

Course Abbreviation: APT 1222

Classification: Vocational–Technical Core

Description: Theory of basic gas turbine engines and related accessories including unducted fan systems and turbine-driven auxiliary power units. (2 sch: 37-clock-hr lecture)

Pre/Corequisites: None

Competencies and Suggested Objectives
1. Explain theory of turbine engines, and maintain turbine engine fan systems and components.[APT1, APT3] a. Describe the design, construction, and performance of turbojet, turbofan, turboprop, and turbo shaft engines. (1) [(DOK2)] b. Inspect and troubleshoot unducted fan systems and components. (1) [(DOK3)] c. Inspect, check, service, and troubleshoot turbine-driven auxiliary power units. (1) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)

A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Federal Aviation Administration. (n.d.). Retrieved May 10, 2006, from http://www.faa.gov

King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Turbine Engine Overhaul and Inspection

Course Abbreviation: APT 1233

Classification: Vocational–Technical Core

Description: Overhaul of basic gas turbine engines and related accessories and components, including disassembly, inspection, assembly, and operation of jet engines. (3 sch: 28-clock-hr lecture, 92-clock-hr lab)

Pre/Corequisites: Turbine Engine Theory (APT 1222)

Competencies and Suggested Objectives
1. Maintain aircraft turbine engine. APT1, APT3
a. Overhaul turbine engine. (2) (DOK2)
b. Inspect, check, service, and repair turbine engines and turbine engine installations. (3) (DOK3)
c. Install, troubleshoot, and remove turbine engines. (3) (DOK3)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT3 Power Plants

Related Academic Standards

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M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)

A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
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L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Preventive maintenance, preventive maintenance of aircraft. (1983). Washington, DC: U.S. Government Printing Office, AC 43-12A.

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Federal Aviation Administration. (n.d.). Retrieved May 10, 2006, from http://www.faa.gov

King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Power Plant Conformity and Airworthiness Inspection

Course Abbreviation: APT 1241

Classification: Vocational–Technical Core

Description: Inspection of aircraft power plants for conformity with airworthiness directives and manufacturer's specifications. Inspections will conform with all Federal Aviation regulations. (1 sch: 14-clock-hr lecture, 18-clock-hr lab)

Pre/Corequisites: Turbine Engine Overhaul and Inspection (APT 1233) and Reciprocating Engine Overhaul and Inspection (APT 1213)

Competencies and Suggested Objectives
1. Perform power plant conformity and airworthiness inspections. APT1, APT2, APT3
a. Perform power plant conformity and airworthiness inspections. (3) (DOK3)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

Related Academic Standards

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M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)

A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Federal Aviation Administration. (n.d.). Retrieved May 10, 2006, from http://www.faa.gov

King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Lubrication and Fuel Metering Systems

Course Abbreviation: APT 1254

Classification: Vocational–Technical Core

Description: Aircraft lubrication, fuel metering, and fuel system components for reciprocating and turbine engines. Identification and selection of engine fuels and lubricants. (4 sch: 55-clock-hr lecture, 68-clock-hr lab)

Pre/Corequisites: Turbine Engine Overhaul and Inspection (APT 1233) and Reciprocating Engine Overhaul and Inspection (APT 1213)

Competencies and Suggested Objectives
1. Maintain aircraft lubrication systems. APT1, APT3 a. Identify and select lubricants. (2) (DOK1) b. Repair engine lubrication system components. (2) (DOK1) c. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (3) (DOK3)
2. Maintain aircraft fuel metering systems. APT1, APT3 a. Troubleshoot and adjust turbine engine fuel metering systems and electronic fuel controls. (1) (DOK3) b. Overhaul carburetor. (2) (DOK2) c. Repair engine fuel metering system components. (2) (DOK1) d. Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems. (3) (DOK3)
3. Maintain aircraft engine fuel systems. APT1, APT3 a. Repair engine fuel system components. (2) (DOK2) b. Inspect, check, service, troubleshoot, and repair engine fuel systems. (3) (DOK3)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT3 Power Plants

Related Academic Standards

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R2 Words in Context (same and opposite meaning)
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M8 Percents
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S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Induction, Cooling, and Exhaust Systems

Course Abbreviation: APT 1262

Classification: Vocational–Technical Core

Description: Reciprocating and turbine induction and engine airflow systems, engine cooling systems, and engine exhaust and reverser systems. (2 sch: 27-clock-hr lecture, 52-clock-hr lab)

Pre/Corequisites: Turbine Engine Overhaul and Inspection (APT 1233) and Reciprocating Engine Overhaul and Inspection (APT 1213)

Competencies and Suggested Objectives
1. Perform maintenance on aircraft induction and engine airflow systems.[APT1, APT2, APT3] a. Inspect, check, troubleshoot, service, and repair engine ice and rain control systems. (2) [(DOK3)] b. Inspect, check, service, troubleshoot, and repair heat exchangers, superchargers, and turbine engine airflow and temperature control systems. (1) [(DOK3)] c. Inspect, check, service, and repair carburetor air intake and induction manifolds. (3) [(DOK2)]
2. Perform maintenance on aircraft engine cooling systems.[APT1, APT2, APT3] a. Repair engine cooling system components. (2) [(DOK2)] b. Inspect, check, troubleshoot, service, and repair engine cooling systems. (3) [(DOK3)]
3. Perform maintenance on engine exhaust and reverser systems.[APT1, APT2, APT3] a. Repair engine exhaust system components. (2) [(DOK2)] b. Inspect, check, troubleshoot, service, and repair engine exhaust systems and related components. (3) [(DOK3)] c. Troubleshoot and repair engine thrust reverser systems and related components. (1) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

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R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
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M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
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S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

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CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Aviation Electricity II

Course Abbreviation: APT 2114

Classification: Vocational–Technical Core

Description: Aircraft engine systems including instrument, engine fire protection, engine electrical, ignition, and starting. (4 sch: 55-clock-hr lecture, 67 -lock-hr lab)

Prerequisites: Turbine Engine Overhaul and Inspection (APT 1233) and Reciprocating Engine Overhaul and Inspection (APT 1213)

Competencies and Suggested Objectives
1. Maintain aircraft engine instrument systems. APT1, APT2, APT3 a. Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems. (2) (DOK3) b. Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and rpm indicating systems. (3) (DOK3)
2. Maintain aircraft engine fire protection systems. APT1, APT2, APT3 a. Inspect, check, service, troubleshoot, and repair engine detection and extinguishing systems. (3) (DOK3)
3. Maintain aircraft engine electrical systems. APT1, APT2, APT3 a. Repair engine electrical system components. (2) (DOK2) b. Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices. (3) (DOK3)
4. Maintain aircraft ignition and starting systems. APT1, APT2, APT3 a. Overhaul magneto and ignition harness. (2) (DOK2) b. Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components. (2) (DOK3) c. Inspect service, troubleshoot, and repair turbine engine electrical starting systems. (3) (DOK3) d. Inspect, check, service, troubleshoot, and repair turbine engine pneumatic starting systems. (1) (DOK3)

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King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Propellers and Power Plant Review

Course Abbreviation: APT 2123

Classification: Vocational–Technical Core

Description: Inspection, service, and repair of fixed-pitch, constant-speed, and feathering propellers. Included are propeller governing systems, propeller synchronizing, and ice removal systems. Review of power plant courses. (3 sch: 36-clock-hr lecture, 45-clock-hr lab)

Prerequisites: Turbine Engine Overhaul and Inspection (APT 1233), Reciprocating Engine Overhaul and Inspection (APT 1213), and all power plant courses

Competencies and Suggested Objectives
1. Maintain aircraft propellers and propeller systems. APT1, APT2, APT3 a. Inspect, check, and repair propeller synchronizing and ice control systems. (1) (DOK3) b. Identify and select propeller lubricants. (2) (DOK1) c. Balance propellers. (1) (DOK1) d. Repair propeller control system components. (2) (DOK3) e. Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems. (3) (DOK3) f. Install, troubleshoot, and remove propellers. (3) (DOK3) g. Repair aluminum alloy propeller blades. (3) (DOK2)
2. Conduct review of all power plant courses. APT1, APT 2, APT3 a. Review all power plant courses. (DOK1)

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CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Structures I

Course Abbreviation: APT 2135

Classification: Vocational–Technical Core

Description: Sheet metal structures and welding processes as applied to aviation mechanics. (5 sch: 43-clock-hr lecture, 131-clock-hr lab)

Prerequisite: None

Competencies and Suggested Objectives
1. Maintain aircraft sheet metal structures.[APT1, APT2] a. Inspect, check, service, and repair windows, doors, and interior furnishings. (2) [(DOK1)] b. Inspect and repair sheet metal structures. (3) [(DOK1)] c. Install conventional rivets. (3) [(DOK1)] d. Form, lay out, and bend sheet metal. (3) [(DOK1)] e. Select, install, and remove special fasteners for metallic, bonded, and composite structures. (2) [(DOK1)]
2. Perform aircraft welding.[APT1, APT2] a. Weld magnesium and titanium. (1) [(DOK2)] b. Solder stainless steel. (1) [(DOK2)] c. Fabricate tubular structures. (1) [(DOK3)] d. Solder, braze, gas weld, and arc weld steel. (2) [(DOK2)] e. Weld aluminum and stainless steel. (1) [(DOK2)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)

M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Structures II

Course Abbreviation: APT 2143

Classification: Vocational–Technical Core

Description: Aircraft wood and non-metallic structures, covering, and finishes. (3 sch: 42-clock-hr lecture, 59-clock-hr lab)

Pre/Corequisites: Structures I (APT 2135)

Competencies and Suggested Objectives
1. Maintain aircraft wood structures.[APT1, APT2] a. Service and repair wood structures. (1) [(DOK1)] b. Identify wood defects. (1) [(DOK3)] c. Inspect wood structures. (1) [(DOK3)]
2. Maintain aircraft covering.[APT1, APT2] a. Select and apply fabric and fiberglass covering materials. (1) [(DOK2)] b. Inspect, test, and repair fabric and fiberglass. (1) [(DOK3)]
3. Maintain aircraft non-metallic structures.[APT1, APT2] a. Inspect bonded structures. (2) [(DOK2)] b. Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures. (2) [(DOK3)]
4. Maintain aircraft finishes.[APT1, APT2] a. Apply trim, letters, and touch-up paint. (1) [(DOK1)] b. Identify and select aircraft finishing materials. (2) [(DOK1)] c. Apply finishing materials. (2) [(DOK2)] d. Inspect finishes, and identify defects. (2) [(DOK2)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe

Related Academic Standards

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M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
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A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
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L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Aircraft Controls

Course Abbreviation: APT 2212

Classification: Vocational–Technical Core

Description: Aircraft rigging and assembly. (2 sch: 17 clock-hr lecture, 42 clock-hr lab)

Prerequisites: Structures II (APT 2143)

Competencies and Suggested Objectives
1. Perform procedures to rig and assemble aircraft. APT1, APT2 a. Rig rotary-wing aircraft. (1) (DOK2) b. Rig fixed-wing aircraft. (2) (DOK2) c. Assemble aircraft. (2) (DOK2) d. Assemble aircraft components, including flight control surfaces. (3) (DOK2) e. Balance, rig, and inspect movable primary and secondary flight control surfaces. (3) (DOK2) f. Jack aircraft. (3) (DOK1)

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CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
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Course Name: Aviation Electricity III

Course Abbreviation: APT 2222

Classification: Vocational–Technical Core

Description: Airframe electrical systems and components including wiring, switches, and controls. (2 sch: 28-clock-hr lecture, 41-clock-hr lab)

Pre/Corequisites: Aircraft Controls (APT 2212)

Competencies and Suggested Objectives
1. Maintain aircraft electrical system components.[APT1, APT2, APT3] a. Repair and inspect aircraft electrical system components, crimp and splice wiring to manufacturer's specifications, and repair pins and sockets of aircraft wiring connectors. (2) [(DOK3)] b. Install, check, and service airframe electrical wiring controls, switches, indicators, and protective devices. (3) [(DOK3)] c. Inspect, check, troubleshoot, service, and repair alternating and direct current electrical systems. (3) [(DOK3)] d. Inspect, check, troubleshoot, and service constant speed and integrated speed drive generators. (1) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)

M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Hydraulic and Pneumatic Power Systems

Course Abbreviation: APT 2232

Classification: Vocational–Technical Core

Description: Aircraft hydraulic and pneumatic power systems and components. (2 sch: 18-clock-hr lecture, 42-clock-hr lab)

Pre/Corequisites: Aviation Electricity III (APT 2222)

Competencies and Suggested Objectives
1. Perform maintenance and repair of hydraulic and pneumatic power systems. APT1, APT2, APT3 a. Repair hydraulic and pneumatic power systems components. (2) (DOK2) b. Identify and select hydraulic fluids. (3) (DOK1) c. Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems. (3) (DOK3)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plant

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
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M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)

A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Landing Gear and Protection Systems

Course Abbreviation: APT 2243

Classification: Vocational–Technical Core

Description: Aircraft landing gear systems, position and warning systems, and ice and rain control systems. (3 sch: 32-clock-hr lecture, 42-clock-hr lab)

Pre/Corequisites: Aviation Electricity III (APT 2222)

Competencies and Suggested Objectives
1. Maintain aircraft landing gear systems.[APT1, APT2] a. Inspect, check, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems. (3) [(DOK3)]
2. Maintain aircraft position and warning systems.[APT1, APT2] a. Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems. (2) [(DOK2)] b. Inspect, check, troubleshoot, service, and repair landing gear position indicating and warning systems. (3) [(DOK3)]
3. Maintain ice and rain control systems.[APT1, APT2] a. Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems. (2) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)

M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Environmental Control

Course Abbreviation: APT 2251

Classification: Vocational–Technical Core

Description: Inspecting, troubleshooting, and servicing environmental control systems and cabin atmosphere control systems. (1 sch: 14-clock-hr lecture, 24-clock-hr lab)

Pre/Corequisites: Aviation Electricity III (APT 2222)

Competencies and Suggested Objectives
1. Perform procedures to maintain aircraft environmental control systems. APT1, APT2, APT3 a. Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, pressurization systems, and air cycle machines. (1) (DOK3) b. Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems. (1) (DOK3) c. Inspect, check, troubleshoot, service, and repair oxygen systems. (2) (DOK3)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plant

Related Academic Standards

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
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Course Name: Aircraft Instrumentation Systems

Course Abbreviation: APT 2263

Classification: Vocational–Technical Core

Description: Aircraft instrument systems, communications and navigation systems, and aircraft fire protection systems. (3 sch: 42-clock-hr lecture, 42-clock-hr lab)

Prerequisites: Aviation Electricity III (APT 2222)

Competencies and Suggested Objectives
1. Maintain aircraft instrument systems.[APT1, APT2, APT3] a. Inspect, check, service, troubleshoot, and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, time, temperature, pressure, and position indicating systems to include use of built-in test equipment. (1) [(DOK3)] b. Install instruments, and perform a static pressure system leak test. (2) [(DOK2)]
2. Maintain aircraft communications and navigation systems.[APT1, APT2, APT3] a. Inspect, check, and troubleshoot autopilot, servos, and approach coupling systems. (1) [(DOK3)] b. Inspect, check, and service aircraft electronic communication and navigation systems, including VHF passenger address interphones and static discharge devices, aircraft VOR, ILS, LORAN, radar beacon transponders, flight management computers, and GPWS. (1) [(DOK3)] c. Inspect and repair antenna and electronic equipment installations. (2) [(DOK2)]
3. Maintain aircraft fire protection systems.[APT1, APT2, APT3] a. Inspect, check, service, and troubleshoot smoke and carbon monoxide detection systems. (1) [(DOK3)] b. Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems. (3) [(DOK3)]

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)

R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Federal Aviation Administration. (n.d.). Retrieved May 10, 2006, from http://www.faa.gov

King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Aircraft Fuel Systems

Course Abbreviation: APT 2271

Classification: Vocational–Technical Core

Description: Construction, inspection, and maintenance of various fuel systems and components including tanks, pumps, strainers, tubing, and hoses. (1 sch: 18-clock-hr lecture, 18-clock-hr lab)

Pre/Corequisites: Aviation Electricity III (APT 2222)

Competencies and Suggested Objectives
1. Perform procedures for construction, inspection, and maintenance of aviation fuel systems. APT1, APT2, APT3
a. Check and service fuel dump systems. (1) (DOK1)
b. Perform fuel management, transfer, and defueling. (1) (DOK1)
c. Inspect, check, and repair pressure fueling systems. (1) (DOK2)
d. Repair aircraft fuel system components. (2) (DOK1)
e. Inspect and repair fluid quantity indicating systems. (2) (DOK2)
f. Troubleshoot, service, and repair fluid pressure and temperature warning systems. (2) (DOK3)
g. Inspect, check, service, troubleshoot, and repair aircraft fuel systems. (3) (DOK3)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe
APT3 Power Plants

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)

M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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King Schools, Inc. (n.d.). Retrieved May 10, 2006, from http://kingschools.com

Course Name: Airframe Inspection and Review

Course Abbreviation: APT 2282

Classification: Vocational–Technical Core

Description: Airframe conformity and air worthiness inspections and maintenance procedures. Review of all airframe courses. (2 sch: 14-clock-hr lecture, 42-clock-hr lab)

Prerequisites: All airframe courses

Competencies and Suggested Objectives
1. Perform airframe conformity and airworthiness inspection and maintenance procedures. APT1, APT2 a. Perform airframe conformity and air worthiness inspections. (3) (DOK3) b. Review airframe systems inspection and maintenance procedures. (1) (DOK2)
2. Conduct airframe review. APT1, APT2, APT3 a. Review all courses related to airframe systems. (DOK1)

STANDARDS

FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1 General Aviation Fundamentals
APT2 Airframe

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)

A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Course Name: Special Project for Aviation Maintenance Technology

Course Abbreviation: APT 233(1–5)

Classification: Vocational–Technical Elective (Aviation Maintenance Technology)

Description: Practical application of skills and knowledge gained in other aviation or aviation-related technical courses. The instructor works closely with the student to ensure that the selection of a project will enhance the student's learning experience. (1–4 sch: 2- to 8-hr lab)

Pre/Corequisites: Consent of instructor

Competencies and Suggested Objectives
1. Develop a written plan that details the activities and projects to be completed. a. Utilize a written plan that details the activities and projects to be completed. b. Perform written occupational objectives in the special project.
2. Assess accomplishment of objectives. a. Prepare daily written assessment of accomplishment of objectives. b. Present weekly written reports of activities performed and objectives accomplished to the instructor.
3. Utilize a set of written guidelines for the special project. a. Develop and follow a set of written guidelines for the special project.

STANDARDS

Specific standards for this course will depend upon the nature of the problem under investigation.

SUGGESTED REFERENCES

Specific references for this course will depend upon the nature of the problem under investigation.

Course Name: Supervised Work Experience for Aviation Maintenance Technology

Course Abbreviation: APT 234(1–6)

Classification: Vocational–Technical Elective (Aviation Maintenance Technology)

Description: This cooperative program between industry and education is designed to integrate the student's technical studies with industrial experience. Variable credit is awarded on the basis of 1 semester hour per 45 industrial contact hours. (1–6 sch: 3- to 18-hr externship)

Prerequisites: Consent of instructor

Competencies and Suggested Objectives
1. Apply technical skills needed to be a viable member of the workforce. a. Prepare a description of technical skills to be developed in the supervised work experience program. b. Develop technical skills needed to be a viable member of the workforce.
2. Apply skills developed in other program area courses. a. Perform skills developed in other program area courses in the supervised work experience program.
3. Apply human relationship skills. a. Practice human relationship skills in the supervised work experience program.
4. Apply and practice positive work habits and responsibilities. a. Perform assignments to develop positive work habits and responsibilities.
5. Work with the instructor and employer to develop written occupational objectives to be accomplished. a. Perform written occupational objectives in the supervised occupational experience program.
6. Assess accomplishment of objectives. a. Prepare daily written assessment of accomplishment of objectives. b. Present weekly written reports of activities performed and objectives accomplished to the instructor.
7. Utilize a set of written guidelines for the supervised work experience. a. Develop and follow a set of written guidelines for the supervised work experience.

STANDARDS

Specific standards for this course will depend upon the nature of the problem under investigation.

SUGGESTED REFERENCES

Specific references for this course will depend upon the nature of the problem under investigation.

Recommended Tools and Equipment

CAPITALIZED ITEMS

1. Auxiliary power unit (2)
2. Booth, spray, with accessories (1)
3. Borescope, aircraft engine (1)
4. Brake, bench, universal box, and pan (1)
5. Brake, sheet metal (1)
6. Cabinet, abrasive dry blast (1)
7. Cabinet, flammable storage (1)
8. Cabinet, sanitary, with safety glasses (1)
9. Cabinet, tool (1)
10. Caliper, vernier, dial, and manual (7)
11. Carburetor (15)
12. Carburetor cut away (1)
13. Cart, recovery/recycle air-conditioning service (1)
14. Charger, aircraft battery (1)
15. Charger/analyzer, aircraft battery (1)
16. Cleaner, steam, portable (1)
17. Compressor, portable, with spray painter (1)
18. Computer, with CD/DVD capability (10)
19. Cylinder heating unit (1)
20. Dial indicator set (2)
21. Disc brake trainer, with wheel (1)
22. Drill, air, angle, 1/4-in. (1)
23. Drill, air, right angle (15)
24. Drill press, 3/4-in., floor (1)
25. Electrical system cut away (1)
26. Engine, aircraft, opposed (3)
27. Engine, aircraft, radial (2)
28. Engine, aircraft, jet (3)
29. Fuel control (3)
30. Fuel flow bench (1)
31. Growler, armature (1)
32. Gun, huck, 3/16-in. rivet (10)
33. Gun, huck, 1/4-in. rivet (10)C
34. Hydraulic mule (variable pressure) (1)
35. Hoist, aircraft (straddler type) (1)
36. Hone, cylinder, set (1)
37. Hydraulic system cut away (1)
38. Insert, valve seat (1)
39. Instrument systems cut away (1)
40. Jack, aircraft, set (1)
41. Kit, hose, fabrication (1)
42. Kit, system charge test (1)

43. Landing gear components cut away (1)
44. Lathe, aircraft armature (1)
45. Lathe, with accessories (1)
46. Leak detector (1)
47. Machine, magnaflux (1)
48. Machine, valve grinding (1)
49. Magneto (20)
50. Magneto cut away (1)
51. Micrometer, set (4)
52. Micrometer, inside and outside, set (4)
53. Micrometer, depth, set (4)
54. Operational twin engine complex aircraft (1)
55. Plane, full system/operational single engine (2)
56. Plasma arc cutter with accessories (1)
57. Plate, surface (1)
58. Power plant accessories cut away (1)
59. Press, arbor (1)
60. Protractor, propeller (1)
61. Propeller balancer (1)
62. Propeller, constant speed (1)
63. Propeller, fixed pitch (1)
64. Propeller, ground adjustable (1)
65. Propeller, hydramatic (1)
66. Propeller stand (1)
67. Pump, strut (1)
68. PT6 hot section kit (1)
69. Refrigerant, reclaiming, and servicing unit (1)
70. Roll forming machine, metal (1)
71. Sander, belt and disc (1)
72. Saw, band (2)
73. Saw, horizontal metal cutoff (1)
74. Saw, reciprocating (2)
75. Scale, aircraft weighing, set (1)
76. Shear, air powered (1)
77. Shear, squaring, 3-ft (1)
78. Shear, squaring, 4-ft (1)
79. Spark plug cleaner, tester and gap setter (1)
80. Stand, engine test (operational) (2)
81. Stand, magneto test (1)
82. Stretcher/shrinker, metal (1)
83. Supercharger cut away (1)
84. Technical library, light aircraft (1)
85. Tester, air speed (1)
86. Test kit, exhaust gas, digital (1)
87. Tester, cylinder, compression, differential (6)
88. Test stand, aircraft generator (1)

89. Tester kit, cylinder head temperature system (1)
90. Test unit, inductance and capacitance (1)
91. Test unit, eddy current (1)
92. Test unit, ultrasonic (1)
93. Tester and cleaner, spark plug (1)
94. Tester, static pressure system (1)
95. Tester, torque wrench (1)
96. Tester, valve spring (1)
97. Tool box, aviation specialty tools (1)
98. Tool, huck rivet puller (2)
99. Tool, tube beading, set (2)
100. Tractor, tug (1)
101. Trainer, operational maintenance run stand, turbine engine (1)
102. Trainer, operational maintenance run stand, reciprocating engine (1)
103. Trainer, jet engine removal, installation, and rigging (1)
104. Tube, flaring, kit (7)
105. Tube, bender, set (2)
106. Turbocharger (1)
107. Unit, ground power, portable (2)
108. Washer, parts (1)
109. Welder, electric arc with accessories (1)
110. Welder, Metal Inert Gas (MIG) with accessories (1)
111. Welder, Tungsten Inert Gas (TIG) with accessories (1)
112. Welding and cutting unit, oxy-fuel with accessories (10)

NON-CAPITALIZED ITEMS

1. Balancer, aircraft wheel (2)
2. Bench, work (20)
3. Bucking bars, rivet (20)
4. Brake rivet tools, set (1)
5. Cabinet, file (4)
6. Cabinet, storage (10)
7. Cabinet, shelves, storage (5)
8. Cleaner, vacuum, wet/dry (1)
9. Compressor, air (1)
10. Cylinder wrench, set, Lycoming, and continental (2)
11. Dies and block, set (1)
12. Disc, engine timing (1)
13. Drill, air, 3/8-in. (20)
14. Drill attachment (1)
15. Drill, cordless 3/8-in. drive (2)
16. Drill, air, 1/4-in. (20)
17. Drill, bit sets (3)
18. First aid kit (2)
19. Flange, propeller mounting (1)

20. First aid, eye wash station (1)
21. Gauge, hole, set (4)
22. Gauge, telescoping, set (6)
23. Gear, puller (2)
24. Grinder, bench (1)
25. Grinder, die (2)
26. Grinder, pedestal (1)
27. Gun, grease (2)
28. Gun, paint spray (2)
29. Gun, solid rivet (20)
30. Gun, rivet cherry (10)
31. Hydrometer, battery (5)
32. Hoist, chain, 2 ton (1)
33. Hose, air, 50 ft (20)
34. Hose, air, 25 ft (20)
35. Kit, ignition parts (1)
36. Kit, helicoil, set (1)
37. Kit, tire inflation (1)
38. Machine, crimp/bead (1)
39. Metal holder and pliers (20)
40. Magneto timing lights (10)
41. Meter, digital, volt/ohm (10)
42. Meter, volt/ohm (10)
43. Microshaver, rivet (2)
44. Nicropress tool set (1)
45. Nibbler, air powered (1)
46. Nibbler, hand held (3)
47. Printer, with accessories (4)
48. Ratchet, air, 3/8-in. (1)
49. Rivet, cutters (5)
50. Rivet, straight and angled, set (50)
51. Remover set, valve guide (1)
52. Ring compressor, piston, set (1)
53. Router (2)
54. Sander, air (1)
55. Screw, extractor, set (2)
56. Squeeze, small C (wire fittings) (2)
57. Stools (25)
58. Tachometer tester, strobe type (1)
59. Tap and die, set (1)
60. Tire bead breaker (1)
61. Tensiometer (3)
62. Tester, fabric, maule (1)
63. Tester, high tension lead (3)
64. Tester, valve lifter (1)
65. Tool, bearing puller, set (1)

66. Tool, air-conditioning service manifold (1)
67. Tool, rivnut set (1)
68. Tool, swaging (5)
69. Tool, torque wrench, set (2)
70. Tool, valve guide remover, set (1)
71. Tools, composite, set (10)
72. Towbar, aircraft (2)
73. Torque wrench (10)
74. Tube, cutters (2)
75. V-Block, runout set (1)
76. Valve spring compressor (2)
77. Vise, bench (10)

RECOMMENDED INSTRUCTIONAL AIDS

It is recommended that instructors have access to the following items:

1. Cart, AV (for overhead projector) (1)
2. Cart, AV (for TV–VCR/CD/DVD) (1)
3. Computer with CD/DVD (1)
4. Overhead projector (1)
5. Printer (1)
6. Screen, projector (1)
7. TV–VCR/CD/DVD (1)
8. Video out (microcomputer to TV monitor) (1)
9. Video projector (1)
10. Videotapes, systems, and procedures (80)

Assessment

Blueprint

This program is assessed using the MS-CPAS2. The blueprint summary contains the competencies that are measured when assessing this program. Competencies are grouped into clusters, and a weight is given to each cluster to determine the number of items needed from each cluster. The numbers of C1s and C2s (item difficulty levels) are also indicated on the blueprint.

Please visit http://info.rcu.msstate.edu/services/curriculum.asp to download the blueprint that accompanies this curriculum.

Appendix A: Federal Aviation Regulations[1]

Federal Aviation Regulations, Part 147, Aviation Maintenance Technician Schools, FAA (Code of Federal Regulations - Part 147 - Aviation Maintenance Technician)

APT1	General Aviation Fundamentals
APT2	Airframe
APT3	Power Plants

[1] Aviation Maintenance Technician Schools. (2005). *Federal aviation regulations, part 147*. Retrieved May 19, 2006, from http://ecfr.gpoaccess.gov/cgi/t/text/textidx?c=ecfr&sid=f4866fb822b1dbcc615562678afed80b&rgn=div5&view=text&node=14:3.0.1.1.6&idno=14

Appendix B: Related Academic Standards[2]

Reading

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary/paraphrase, compare/contrast, cause/effect)
R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)

Mathematics Computation

M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations

Applied Mathematics

A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)

Language

L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)

Spelling

S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

[2] CTB/McGraw-Hill LLC. (2005). *Tests of adult basic education, forms 7 and 8*. Monterey, CA: Author.

Appendix C: 21st Century Skills[3]

CSS1-21st Century Themes

CS1 Global Awareness

1. Using 21st century skills to understand and address global issues
2. Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
3. Understanding other nations and cultures, including the use of non-English languages

CS2 Financial, Economic, Business, and Entrepreneurial Literacy

1. Knowing how to make appropriate personal economic choices
2. Understanding the role of the economy in society
3. Using entrepreneurial skills to enhance workplace productivity and career options

CS3 Civic Literacy

1. Participating effectively in civic life through knowing how to stay informed and understanding governmental processes
2. Exercising the rights and obligations of citizenship at local, state, national, and global levels
3. Understanding the local and global implications of civic decisions

CS4 Health Literacy

1. Obtaining, interpreting, and understanding basic health information and services and using such information and services in ways that enhance health
2. Understanding preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance, and stress reduction
3. Using available information to make appropriate health-related decisions
4. Establishing and monitoring personal and family health goals
5. Understanding national and international public health and safety issues

CS5 Environmental Literacy

1. Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water, and ecosystems.
2. Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.).
3. Investigate and analyze environmental issues, and make accurate conclusions about effective solutions.
4. Take individual and collective action toward addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).

CSS2-Learning and Innovation Skills

CS6 Creativity and Innovation

1. Think creatively.
2. Work creatively with others.
3. Implement innovations.

[3] *21st century skills.* (n.d.). Washington, DC: Partnership for 21st Century Skills.

CS7 Critical Thinking and Problem Solving
1. Reason effectively.
2. Use systems thinking.
3. Make judgments and decisions.
4. Solve problems.

CS8 Communication and Collaboration
1. Communicate clearly.
2. Collaborate with others.

CSS3-Information, Media, and Technology Skills

CS9 Information Literacy
1. Access and evaluate information.
2. Use and manage information.

CS10 Media Literacy
1. Analyze media.
2. Create media products.

CS11 ICT Literacy
1. Apply technology effectively.

CSS4-Life and Career Skills

CS12 Flexibility and Adaptability
1. Adapt to change.
2. Be flexible.

CS13 Initiative and Self-Direction
1. Manage goals and time.
2. Work independently.
3. Be self-directed learners.

CS14 Social and Cross-Cultural Skills
1. Interact effectively with others.
2. Work effectively in diverse teams.

CS15 Productivity and Accountability
1. Manage projects.
2. Produce results.

CS16 Leadership and Responsibility
1. Guide and lead others.
2. Be responsible to others.