

**ARKANSAS DEPARTMENT OF EDUCATION
DIVISION OF CAREER AND TECHNICAL EDUCATION
PROGRAM OPERATIONAL GUIDE
2020-21**



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2020-21 ARKANSAS STANDARDS OF ACCREDITATION DIVISION OF CAREER AND TECHNICAL EDUCATION REQUIREMENTS

ADE Rules Governing the Standards for Accreditation of Arkansas Public Schools and School Districts

1-A.1.2 For Grades 5-8, all students shall receive instruction annually in each of the following content areas (S/P):

1-A.1.2.1 English Language Arts;

1-A.1.2.2 Mathematics;

1-A.1.2.3 Science;

1-A.1.2.4 Social Studies;

1-A.1.2.5 Physical Education;

1-A.1.2.6 Fine Arts;

1-A.1.2.7 Health and Safety; and

1-A.1.2.8 Career and Technical Education.

Note: To comply with State Standard 1-A.1.2.8, the Division of Career and Technical Education defines the foundation courses required for all Career and Technical Education (CTE) program for 2020-2021 school year are:

Courses 399050 Keyboarding 7-8 or KeyCode 399320 **and** 399280 Career Development shall be instructed in grades 7 or 8 annually. If a district wishes to offer Keyboarding at a grade level lower than grade 7, approval must be sought from Division of Career and Technical Education prior to implementation. **A request should be submitted through ADE Course Approval System in addition to the Program Coordinator of the Business and Marketing Education office.**

**If a school currently has an approved transition plan in place which allows Keyboarding to be taught in a grade lower than 7, Division of Career and Technical Education will honor the provisions of the approved plan until such time as the school requests the plan be rescinded.*

1-A.1.3 For Grades 9-12, the following content areas shall be offered annually for a total of 38 units, except as otherwise allowed by law and these rules (S/P):

1-A.1.3.1 English Language Arts - 6 units;

1-A.1.3.2 Science - 5 units;

1-A.1.3.3 Mathematics - 6 units;

1-A.1.3.4 Computer Science - 1 unit;

1-A.1.3.5 Foreign Languages - 2 units of the same language;

1-A.1.3.6 Fine Arts - 3 ½ units;

1-A.1.3.7 Social Studies - 4 units;

1-A.1.3.8 Health and Safety Education and Physical Education - 1 ½ units; and

1-A.1.3.9 Career and Technical Education - 9 units of sequenced career and technical education courses representing three (3) occupational areas.

Note: To comply with State Standard 1-A.1.3.9, schools must:

Offer 1 program of study from 3 different Occupational Areas annually. Each Occupational Area defines the required entry level (core) course for each program of study. Core courses must be offered annually.

STATEMENT OF ASSURANCE

All career and technical education opportunities are offered without regard to race, color, national origin, sex, handicap, or age. The following civil rights laws protect individuals from discrimination in programs or activities receiving federal financial assistance:

- Title IV of the Civil Rights Act of 1964
- Title IX of the Education Amendments of 1972
- Section 504 of the Rehabilitation Act of 1973
- Age Discrimination Act of 1975

For Additional Information: <https://www2.ed.gov/about/offices/list/ocr/reports-resources.html>

PROGRAM APPROVAL

Requires completion of an approved program of study that leads to a recognized postsecondary credential, offering a sequence of CTE courses sufficient in size, scope, and quality to comprise a CTE program, offering work-based learning opportunities to students, leadership development such as through a CTE student organization, and the integration applied academics.

Programs of study are reviewed annually. Programs granted approval status shall:

1. Follow all policies and procedures;
2. Remove all critical elements identified in tiered support review(s); and
3. Follow all required program guidelines.

Only career and technical courses approved by DCTE are eligible for Perkins funding and graduation credit. For information on the Standards for Accreditation at <https://adedata.arkansas.gov/sfa>.

FULLY APPROVED PROGRAMS	
If a program received full approval during the previous academic year (AY) and one of the following actions applied the following year, then the district will receive the program status indicated:	
ACTION	PROGRAM STATUS
Critical Elements, including Safety Violations and Office of Civil Rights Violations, received from previous Tiered Support Activities (formerly Technical Assistance Visits)	Conditional Approval
No CTSO active roster	Conditional Approval
No program of study	Conditional Approval
No required foundation courses (reviewed by appropriate program area)	Conditional Approval
Meets all Division of Career and Technical Education policies and standards	FULL APPROVAL

CONDITIONALLY APPROVED PROGRAMS	
If a program was conditionally approved during the previous academic year (AY) and one of the following actions applies the following year, then the district will receive the program status indicated:	
ACTION	STATUS TO RECEIVE
Problems are corrected	FULL APPROVAL
Problems not corrected	Disapproval (see Accountability below)
Critical Elements, including Safety Violations and Office of Civil Rights Violations, received from previous Tiered Support Activities (formerly Technical Assistance Visits)	Disapproval (see Accountability below)

TIERED SUPPORT (Formerly TA Visit or Onsite Compliance Review)

The structure of technical assistance site visits is shifting from a compliance-enforced fixed 5-year rotation of site visits to an annual, ongoing customer-service focused, tiered support model. Although the process is in transition in 2020-21, adherence to existing requirements and documentation is expected until the new process is in place.

MINIMUM FACILITIES REQUIREMENTS

Facility requirements must meet Arkansas Department of Education guidelines

http://arkansasfacilities.arkansas.gov/public/userfiles/documents/Facilities_Manual_20162017/FM_Career_Education.pdf. Equipment requirements may be obtained from the appropriate program office and shall be met within the specified time for program approval.

SAFETY

Space and special equipment for CTE labs are varied and unique. Safety should be of the utmost consideration at all times in planning a facility and locating equipment. Sufficient electrical power should be included to support major pieces of equipment in the lab, including a sufficient number of electrical outlets. OSHA standards shall be followed where applicable.

A student wash up area and proper exhaust and filtration of harmful fumes/dust shall be provided according to the facilities requirements document:

http://arkansasfacilities.arkansas.gov/public/userfiles/documents/Facilities_Manual_20162017/FM_Career_Education.pdf. The laboratory shall be zoned and color-coded identifying specific work areas and pedestrian walkways. Large open areas for instructional activities shall be provided.

Caution must be exercised and enrollment must be limited so that an overcrowded situation does not occur. For the specifications for the lab areas, please see the Arkansas Facilities website linked in the Facilities section above.

MINIMUM START-UP EQUIPMENT REQUIREMENTS

Each Career and Technical Education (CTE) Occupational Program Area issues minimum equipment lists annually. The equipment lists are considered the *minimum* equipment necessary for students to master the program area standards established by the Division of Career and Technical Education. The current version of equipment lists applies to new programs being implemented during the school year in which the equipment lists are issued. Equipment lists may be located at [DCTE Occupational Areas](#) on the Division's Occupational Areas web page.

FOUNDATION COURSES FOR ALL PROGRAMS OF STUDY

399050 Keyboarding

1 Semester Grade Levels: 7-8 (NO CREDIT)

Keyboarding is a one-semester course designed to help students develop speed and accuracy by learning the touch operation of alphanumeric/keyboard characters. Emphasis is placed on the following: mastery of the keyboard with desirable keyboarding techniques; development of speed and accuracy; basic problem-solving applications of centering and arranging reports, letters, and tables; proofreading; formatting; and proper care of the equipment. Keyboarding is a foundation for developing entry-level skills for business careers.

399320 KeyCode

1 Semester Grade Levels: 7-8 (NO CREDIT)

KeyCode is a one-semester course designed to cover the state keyboarding and computer science coding block standards. Emphasis is placed on the following: understanding the importance of Career and Technical Student Organizations (CTSO), soft skill development, operation and management of classroom equipment, touch typing method, simple document formatting, and the computer science coding block. A minimum of 5 weeks shall be dedicated to students using keyboarding skills as they relate to formulating algorithms as well as create, analyze, test and debug computer programs in order to solve real-world problems. A text based programming language is required to accomplish these tasks.

399280 Career Development

1 Semester Grade Levels: 7 or 8 (8th grade recommended) (NO CREDIT)

This CTE foundation course is a one or two semester class for grades 7-8 designed to teach career development through research and understanding of self and the world of work for college and career readiness. Career research and decision-making with education and training plans for exploration and development will be core standards. Students will be knowledgeable of career options, and the personal skills, aptitudes, and employer expectations of future careers of choice. Students will identify personal traits and characteristics for a better understanding of self in their pursuit of finding a meaningful, fulfilling and rewarding career. Through better recognition and understanding of personal interests, values, aptitudes and abilities students can assess how they relate to the world of work in order to acquire the skills necessary for appropriate placement in the workforce. In addition, students will demonstrate the use of technology to gather information about careers and demonstrate an understanding of the ways in which work, family, and leisure roles are interrelated. Students shall develop a career focus with viable expectations for success based upon careful research, consistent planning and employment preparation.

Course Information for Science, Technology, Engineering and Math (STEM)

<i>CLUSTER: ARCHITECTURE AND CONSTRUCTION</i>	
Pathway	Program of Study
Design & Pre-Construction	Architectural CAD Engineering CAD
<i>CLUSTER: HEALTH SCIENCES</i>	
Pathway	Program of Study
Biotechnology Research & Development	Biomedical Sciences - PLTW
<i>CLUSTER: STEM (SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS)</i>	
Pathway	Program of Study
Engineering & Technology	Pre-Engineering Pre-Engineering - PLTW Unmanned Aerial Systems Automation and Robotics Technology
<i>CLUSTER: INFORMATION TECHNOLOGY</i>	
Pathway	Program of Study
Programming/Software Development	Software Development/Engineering Hardware Engineer/Network Architect Mobile Applications Development Website Development ASU UpSkill Coding with Swift Cybersecurity Game Development Robotics

Program Descriptions

STEM Programs are designed to train individuals in in the fields of Science, Technology, Engineering and Mathematics by:

- Solving real-world problems through problem-based learning
- Teaching a rigorous curriculum using advanced technology
- Improving problem solving skills through engineering by design processes
- Designing, planning, managing, building, and maintaining physical structures and the larger built environment, including roadways and bridges and industrial, commercial, and residential facilities and buildings
- Planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development
- Applying technical knowledge and skills in one or more trade, technical, and/or professional occupations. Students will engage in activities and instruction enabling them to use, create, problem solve, and control various technology resources: people, tools, machines, information, materials, energy, capital, and time.

Career and Technical Student Organization (CTSO)

Technology Student Association (TSA), Health Occupations Student Association (HOSA), and/or SkillsUSA shall be an integral part of each instructional program respectively and shall follow the same guidelines, goals, objectives, and participate in activities of the Arkansas state chapter as well as the respective national organization. The CTSO chosen shall align with curriculum that is being taught. TSA is the recommended organization for Mobile Application, Programming or Pre-Engineering Programs such as Project Lead the Way or Engineering Technology Education. HOSA is the recommended program for Biomedical Sciences.

<https://www.arkansastsa.org/>

<http://skillsusaarkansas.weebly.com/>

<http://www.hosa.org/>

JUNIOR HIGH/MIDDLE LEVEL COURSES:

Gateway to Technology: Project Lead the Way (PLTW)

Course Code	Course Name	Credit	7th	8th
399110	Automation and Robotics (AR)	0	X	X
399120	Design and Modeling (DM)	0	X	X
399310	Energy and the Environment (EE)	0	X	X
399250	Flight and Space (FS)	0	X	X
399300	Green Architecture (GA)	0	X	X
399130	The Magic of Electrons (ME)	0	X	X
399140	The Science of Technology (ST)	0	X	X
399180	Career Medical Detectives (MD)	0	X	X

*There are no longer core courses for PLTW Gateway to Technology

Engineering Technology Education

Course Code	Non-Program Specific Electives	Credit	7th	8th	9th
399150	Engineering Technology Education I (ETE 1)	0	X	X	
399160	Engineering Technology Education II (ETE 2)	0	X	X	
494010	Engineering Technology Education I	.5			X
494020	Engineering Technology Education II	.5			X

Pathways and Programs of Study by Career Cluster

Architecture and Construction Cluster

The Architecture and Construction Cluster encompasses designing, planning, managing, building, and maintaining physical structures and the larger built environment, including roadways and bridges and industrial, commercial, and residential facilities and buildings

Design and Pre-Construction Pathway

Program of Study	Level One	Level Two	Level Three
Architectural CAD	Drafting and Design (494700)	Architectural/CAD I (494710)	<ol style="list-style-type: none"> 1. Architectural/CAD II (494730) 2. Youth Apprenticeship (490300) 3. Career Practicum (490690)
		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. Autodesk Certified User (ACU) Revit 2. Solid Edge Associate

Program of Study	Level One	Level Two	Level Three
Engineering CAD	Drafting and Design (494700)	Engineering/CAD I (494740)	<ol style="list-style-type: none"> 1. Engineering/CAD II (494760) 2. Youth Apprenticeship (490300) 3. Career Practicum (490690)
		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. Autodesk Certified User (ACU) Inventor 2. AutoCAD Certified User 3. Solid Edge Associate 4. Certified Solidworks Associate (CSWA)

Health Sciences Cluster

The Health Science Cluster encompasses planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development

Biotechnology Research and Development Pathway

Program of Study	Level One	Level Two	Level Three
Biomedical Sciences	Principles of Biomedical Sciences (PBS) (495000)	Human Body Systems (HBS) (495010)	<ol style="list-style-type: none"> 1. Medical Interventions (MI) (495020) 2. Youth Apprenticeship (490310) 3. Career Practicum (490700)
		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. Biotechnician Assistant Credentialing Exam (B.A.C.E.)

STEM (Science, Technology, Engineering, and Mathematics) Cluster

STEM applies technical knowledge and skills in one or more trade, technical, and/or professional occupations. Students will engage in activities and instruction enabling them to use, create, problem solve, and control various technology resources: people, tools, machines, information, materials, energy, capital, and time.

Engineering and Technology Pathway

Program of Study	Level One	Level Two	Level Three
Pre-Engineering	Introduction to Engineering Design (IED) (495480) OR Innovations in Science and Technology I (493960)	Principles of Engineering (POE) (495490) OR Innovations in Science and Technology II (493970)	<ol style="list-style-type: none"> 1. Aerospace Engineering (AE) (494980) 2. Civil Engineering and Architecture (CEA) (495440) 3. Computer-Integrated Manufacturing (CIM) (495450) 4. Digital Electronics (DE) (495460) 5. Engineering Design and Development (495470) 6. One full credit (2 courses) of AR Approved Computer Science (course codes may vary) 7. Youth Apprenticeship (490330) 8. Career Practicum (490720) 9. Innovations in Science and Technology III (493980)
		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. Autodesk Certified User (ACU) Inventor 2. Autodesk Certified User (ACU) Revit 3. CLAD: Certified LabVIEW Associate Developer 4. Solid Edge Certified Associate

Program of Study	Level One	Level Two	Level Three
Automation and Robotics Technology	Automation and Robotics Technology 1 (490390)	Automation and Robotics Technology 2 (490400)	<ol style="list-style-type: none"> 1. Automation and Robotics Technology 3 (490410) 2. Youth Apprenticeship (490330) 3. Career Practicum (490710)
Our office can add to this area once we have the opportunity to speak to more industry, education and training professionals.		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. ABB Robotics 2. FANUC Robotics

Program of Study	Level One	Level Two	Level Three
Unmanned Aerial Systems	Unmanned Aerial Systems (UAS) I (490160)	Unmanned Aerial Systems (UAS) II (490170)	<ol style="list-style-type: none"> 1. Unmanned Aerial Systems (UAS) III (490180) 2. Unmanned Aerial Systems (UAS) Flex Course (490150) 3. Civil Engineering and Architecture (CEA) (495440) 4. Computer-Integrated Manufacturing (CIM) (495450) 5. Digital Electronics (DE) (495460) 6. Youth Apprenticeship (490330) 7. Career Practicum (490720)
		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. FAA Part 107 Licensure 2. ArcGIS Desktop Entry Certification

Information Technology Cluster

This cluster builds linkages in IT occupations framework: for entry level, careers related to the design, development, support, and management of hardware, software, multimedia and systems integration services.

Programming and Software Development Pathway

Program of Study	Level One	Level Two	Level Three (choose 2)
Computer Science: Software Development/Engineering (0.5 credits each)	<p>CS with Programming/Coding Emphasis 1 (465010)</p> <p>And</p> <p>CS with Programming/Coding Emphasis 2 (465020)</p> <p>OR</p> <p>College Board AP Computer Science Principles (565010)</p> <p>And</p> <p>College Board AP Computer Science Principles (565020)</p>	<p>CS with Programming/Coding Emphasis 3 (465030)</p> <p>CS with Programming/Coding Emphasis 4 (465040)</p> <p>OR</p> <p>College Board AP Computer Science A 1 (565110)</p> <p>College Board AP Computer Science A 2 (565120)</p>	<ol style="list-style-type: none"> 1. Advanced Programming 1 (465050) 2. Advanced Programming 2 (465060) 3. Advanced Programming: Game Design 1 (465650) 4. Advanced Programming Game Design 2 (465660) 5. International Baccalaureate (IB) Computer Science SL 1 (465210) 6. International Baccalaureate (IB) Computer Science SL 2 (465220) 7. International Baccalaureate (IB) Computer Science HL 1 (465310) 8. International Baccalaureate (IB) Computer Science HL 2 (465320) 9. College Board AP Computer Science A 1 (565110) 10. College Board AP Computer Science A 2 (565120)

			<p>11. Computer Science Independent Study 1 (465910) 12. Computer Science Independent Study 2 (465920) 13. Computer Science Internship (465950) 14. Computer Science Internship (465960) 15. CS Concurrent Credit (565910, 565920, 565930, 565940, 565950, 565960, 565970, 565980, 565990) 16. CS Weighted Credit (565810, 565820, 565830, 565840, 565850, 565860, 565870, 565880, 565890)</p>
	<p>Industry Recognized Certifications:</p>		<ol style="list-style-type: none"> 1. Microsoft Technology Associate JavaScript Specialist 2. Microsoft Technology Associate Advanced HTML5/CSS3 3. Oracle <ul style="list-style-type: none"> • Oracle Certified Associate (OCA): Java Programmer • Oracle Certified Professional (OCP): Java Programmer 4. Microsoft <ul style="list-style-type: none"> • MCPD: Microsoft Certified Professional Developer • MCSD: Microsoft Certified Solutions Developer 5. Python Certified Associate in Python (PCAP) Programming 6. CompTIA IT Fundamentals 7. CompTIA Linux+

Program of Study	Level One	Level Two	Level Three (choose 2)
Computer Science: Hardware Engineer/Network Architect (0.5 credits each)	CS with Network/Hardware Emphasis 1 (465110) CS with Network/Hardware Emphasis 2 (465120) or College Board AP Computer Science Principles Level 1 (565010) and College Board AP Computer Science Principles Level 2 (565020)	CS with Network/Hardware Emphasis 3 (465130) CS with Network/Hardware Emphasis 4 (465140)	1. Advanced Networking 1 (465150) 2. Advanced Networking 2 (465160) 3. Computer Science Independent Study 1 (465910) 4. Computer Science Independent Study 2 (465920) 5. Computer Science Internship (465950) 6. Computer Science Internship (465960)
	Industry Recognized Certifications:	1. Cisco Certified Entry Network Tech (CCENT) 2. CompTIA Network + 3. CompTIA Cloud+ 4. CompTIA Linux+ 5. CompTIA IT Fundamentals 6. Microsoft Technology Associate Networking Fundamentals 7. Cisco IT Essentials PC Hardware & Software Certification 8. Cisco Certified Network Associate (CCNA)	

Program of Study	Level One	Level Two	Level Three (choose 2)
Computer Science: Mobile Applications Development (0.5 credits each)	Mobile Application Development 1 (465310) Mobile Application Development 2 (465320) or College Board AP Computer Science Principles Level 1 (565010) and College Board AP Computer Science Principles Level 2 (565020)	Mobile Application Development 3 (465330) Mobile Application Development 4 (465340)	1. Advanced Programming 1 (465050) 2. Advanced Programming 2 (465060) 3. Computer Science Independent Study (465910) 4. Computer Science Independent Study (465920) 5. Computer Science Internship (465950) 6. Computer Science Internship (465960)
		Industry Recognized Certifications:	1. Microsoft Technology Associate Software Development Fundamentals 2. Microsoft Technology Mobility and Device Fundamentals 3. Swift Certification Level 1 4. Associate Android Developer 5. CompTIA Linux+

Program of Study	Level One	Level Two	Level Three (choose 2)
Website Development	Web Technologies (492670) or College Board AP Computer Science Principles Level 1 (565010) and College Board AP Computer Science Principles Level 2 (565020)	Mobile Application Development 1 (465310) Mobile Application Development 2 (465320) or Programming I (465010) and Programming II (465020)	1. Mobile Application Development 3 (465330) 2. Mobile Application Development 4 (465340) or 3. Advanced Programming 1 (465050) 4. Advanced Programming 2 (465060) 5. Youth Apprenticeship (490320) 6. Career Practicum (490710)
		Industry Recognized Certifications:	1. Microsoft Technology Associate Software Development Fundamentals 2. Microsoft Technology Mobility and Device Fundamentals 3. Swift Certification Level 1

			<ul style="list-style-type: none"> 4. Associate Android Developer 5. Adobe Certified Associate – Web Communication - Dreamweaver
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Program of Study	Level One	Level Two	Level Three (choose 2)
ASU UPSkill: Coding with Swift All three UPSkill Courses are 9-week courses.	UpSkill Introduction to Coding with Swift Concurrent Credit (565910)	UpSkill Intermediate Coding with Swift Concurrent Credit (565920)	<ul style="list-style-type: none"> 1. Advanced Studio in Swift Coding (Weighted Concurrent Credit 565810) 2. Independent Study for Swift certification (465910) 3. Advanced Programming 1 (465050) 4. Advanced Programming 2 (465060) 8. Computer Science Independent Study (465910) 9. Computer Science Independent Study (465920) 10. Computer Science Internship (465950) 11. Computer Science Internship (465960)
		Industry Recognized Certifications:	<ul style="list-style-type: none"> 1. Swift Certification Level 1

Program of Study	Level One	Level Two	Level Three (choose 2)
Computer Science: Cybersecurity (0.5 credits each)	Computer Science with Information Security 1 (465210) Computer Science with Information Security 2 (465220) or College Board AP Computer Science Principles Level 1 (565010) and College Board AP Computer Science Principles Level 2 (565020)	Computer Science with Information Security 3 (465230) Computer Science with Information Security 4 (465240)	<ul style="list-style-type: none"> 1. Advanced Information Security (465250) 2. Advanced Information Security (465260) 3. Computer Science Independent Study (465910) 4. Computer Science Independent Study (465920) 5. Computer Science Internship (465950) 6. Computer Science Internship (465960)
		Industry Recognized Certifications:	<ul style="list-style-type: none"> 1. CompTIA Network+ 2. CompTIA Security+ 3. CompTIA Server+

Program of Study	Level One	Level Two	Level Three (choose 2)
Computer Science: Game Development	CS with Programming/Coding Emphasis 1 (465010) and CS with Programming/Coding Emphasis 1 (465020) or College Board AP Computer Science Principles Level 1 (565010) and College Board AP Computer Science Principles Level 1 (565020)	CS with Programming/Coding Emphasis 3 (465030) and CS with Programming/Coding Emphasis 4 (465040) (Both should emphasize languages used for game development)	<ol style="list-style-type: none"> 1. Advanced Programming Game Design 1 (465650) 2. Advanced Programming Game Design 2 (465660) 3. Computer Science Independent Study (465910) 4. Computer Science Independent Study (465920) 5. Computer Science Internship (465950) 6. Computer Science Internship (465960)
		Industry Recognized Certifications:	<ol style="list-style-type: none"> 1. MTA Javascript Specialist 2. MTA Advanced HTML5/CSS3 3. Oracle Certified Associate (OCA): Java Programmer 4. Oracle Certified Professional (OCP): Java Programmer 5. Microsoft Certified Professional Developer (MCPD) 6. Microsoft Certified Solutions Developer (MCSD) 7. Python Certified Associate in Python (PCAP) Programming 8. Associate Android Developer 9. Unity

Program of Study	Level One	Level Two	Level Three (choose 2)
Computer Science: Robotics (0.5 credits each)	Robotics 1 (465510) Robotics 2 (465520) or College Board AP Computer Science Principles Level 1 (565010) and College Board AP Computer Science Principles Level 1 (565020)	Robotics 3 (465530) Robotics 4 (465540)	1. Advanced Programming 1 2. (465050) 3. Advanced Programming 2 4. (465060) 5. College Board AP Computer Science A 1 (565110) 6. College Board AP Computer Science A 2 (565120) 7. International Baccalaureate (IB) Computer Science SL 1 (465210) 8. International Baccalaureate (IB) Computer Science SL 2 (465220) 9. International Baccalaureate (IB) Computer Science HL 1 (465310)
			10. International Baccalaureate (IB) Computer Science HL 2 (465320) 11. Computer Science Independent Study (465910) 12. Computer Science Independent Study (465920) 13. Computer Science Internship (465950) 14. Computer Science Internship (465960)
		Industry Recognized Certifications:	1. CompTIA A+ 2. CompTIA Network+ 3. ABB Robotics 4. FANUC Robotics

MIDDLE LEVEL COURSES

Please See ADE CS Activity Codes **App Creators (PLTW)**

Credit: 0 Semester Course-Grade Levels: 7-8

This unit will expose students to computer science as a means of computationally analyzing and developing solutions to authentic problems through mobile app development, and will convey the positive impact of the application of computer science to other disciplines and to society.

399110 Automation and Robotics (AR)

Credit: 0 Semester Course - Grade Levels: 7-8

Students trace the history and development of automation and robotics. They learn about structures, energy transfer, and machine automation. They also find out what they need to study in high school and beyond to prepare for careers in engineering.

Please See ADE CS Activity Codes **Computer Science For Innovators And Makers**

Credit: 0 Semester Course - Grade Levels: 7-8

Throughout the unit, students will learn about programming for the physical world by blending hardware design and software development, allowing students to discover computer science concepts and skills by creating personally relevant, tangible, and shareable projects.

399180 Career Medical Detectives (MD)

Credit: 0 Semester Course - Grade Levels: 7-8

Students play the role of real-life medical detectives as they analyze genetic testing results to diagnose disease and study DNA evidence found at a "crime scene." They solve medical mysteries through hands-on projects and labs, investigate how to measure and interpret vital signs, and learn how the systems of the human body work together to maintain health.

399120 Design and Modeling (DM)

Credit: 0 Semester Course - Grade Levels: 7-8

Students will learn the uses of solid modeling. They will be introduced to the design process and shown how this technology has influenced their lives. Using design briefs or abstracts, students create models and documentation to solve problems.

399310 Energy and the Environment (EE)

Credit: 0 Semester Course - Grade Levels: 7-8

Students investigate the impact of energy on their lives and the environment. Alternative energy sources are evaluated and used to reduce energy consumption through energy efficiency and sustainability.

399150 ETE 1 (Introduction to Engineering and Technology, 7-8th grade)

Credit: 0 Semester Course - Grade Levels: 7-8

Students will develop an understanding of the history of technology involving information and communication, construction, manufacturing, energy, power, transportation and how they can be used to solve technological problems.

399160 ETE 2 (Fundamentals of Engineering and Technology, 7-8th grade)

Credit: 0 Semester Course - Grade Levels: 7-8

Students will further their understanding of the of impact technology has on the modern world involving information and communication, construction, manufacturing, energy, power, transportation and how they can be used to solve technological problems.

399250 Flight and Space (FS)

Credit: 0 Semester Course - Grade Levels: 7-8

The history of aerospace comes to life through hands-on activities and research as students explore the science behind aeronautics. Students use their knowledge to build, design, and test airfoil. Simulation software is used to provide space travel experience.

399300 Green Architecture (GA)

Credit: 0 Semester Course – Grade Levels: 7-8

The concept of “being green” is introduced to the next generation of designers and builders. Students learn about architectural styles and sustainability construction plans. An environmentally friendly home is designed using 3D architecture software.

399130 The Magic of Electrons (ME)

Credit: 0 Semester Course - Grade Levels: 7-8

Students use hands-on projects to explore the science of electricity including the behavior and parts of atoms using sensing devices. Knowledge and skills are acquired in basic circuitry design and the impact of electricity on our lives.

399140 The Science of Technology (ST)

Credit: 0 Semester Course - Grade Levels: 7-8

How science has affected technology throughout history is traced as students learn to apply the concepts in physics, chemistry and nanotechnology to STEM activities and projects.

HIGH SCHOOL COURSES

All Computer Science course fall under the supervision of the Arkansas Computer Science Initiative. Course descriptions and standards for these courses can be found on the [Arkansas K-12 Computer Science](#) webpage.

494980 Aerospace Engineering (AE)

Credit: 1 Grade Levels: 11-12

Through hands-on engineering projects developed with NASA, Aerospace Engineering students learn about aerodynamics, astronautics, space-life sciences, and systems engineering, including the study of intelligent vehicles like the Mars rovers Spirit and Opportunity.

494710 Architectural/CAD I (Core Course)

Credit: 1 Grade Levels: 9-12

Architectural/CAD I focuses on the knowledge and skills required to plan and prepare scale pictorial interpretations of plans and design concepts for residential buildings. Emphasis is given to the development of competencies related to solving drafting and design problems that require the individual to understand and apply a wide range of technical knowledge and critical thinking skills. The course is designed to allow the student to produce architectural drawings as traditional drawings or as computer-aided drawings.

494730 Architectural/CAD II

Credit: 1 Grade Levels: 10-12

Architectural/CAD II focuses on the knowledge and skills required to plan and prepare scale pictorial interpretations of plans and design concepts for residential buildings. Emphasis is given to the development of real world experiences in applying the application of architectural drafting standards. The course is designed to allow the student to produce drawings as traditional drawings or advanced use of various CAD software to produce drawings.

494720 Architectural/CAD Lab

Credit: 1 Grade Levels: 9-12

This production-based program is designed to allow for the development of skills and knowledge needed to execute a comprehensive architectural product.

490390 Automation and Robotics Technology 1

Credit: 1 Grade Levels: 9-12

This introduction to Automation and Robotics Technology enables students to identify and investigate different types of robotics systems. Students engage in designing and analyzing robotics systems.

490400 Automation and Robotics Technology 2

Credit: 1 Grade Levels: 9-12

This course in Automation and Robotics Technology enables students to identify and investigate problems in real-world scenarios, and devise solutions using various robotics systems.

490310 Automation and Robotics Technology 3

Credit: 1 Grade Levels: 9-12

This advanced course includes learning related to programming and creating working stations for robotic systems. Students will demonstrate robotic tool usage and editing programmed positions to optimize robotic performance. Students will demonstrate effective problem solving skills to program the robot to perform a specific, complex task.

495030 Biomedical Innovations (BI) – Capstone Course

Credit: 1 Grade Levels: 11-12

Students apply their knowledge and skills to answer questions and solve problems related to the biomedical sciences. In this capstone course, they may consult with a mentor or advisor from a university, hospital, physician's office, or industry. Students are expected to present the results of their work to an adult audience, which may include representatives from the local healthcare or business community or the school's Partnership Team.

495440 Civil Engineering and Architecture (CEA)

Credit: 1 Grade Levels: 11-12

This course builds upon the computer solid modeling design skills developed in Introduction to Engineering Design. Students will be presented with design problems that require the use of computer-aided drafting skills to develop solutions to the problems.

495450 Computer-Integrated Manufacturing (CIM)

Credit: 1 Grade Levels: 11-12

This course builds upon the computer solid modeling design skills developed in Introduction to Engineering Design. Students will be presented with design problems that require the use of Inventor to develop solutions to the problems.

495460 Digital Electronics (DE)

Credit: 1 Grade Levels: 10-12

Digital Electronics is a course of study in applied digital logic. The course is patterned after the first-semester course in digital electronics taught in two- and four-year colleges. Students will study the application of electronic logic circuits and devices and apply Boolean logic to the solution of problems.

494700 Drafting & Design (Core Course)

Credit: 1 Grade Levels: 9-12

Drafting and Design focuses on the basic knowledge and skills required to produce engineering and architectural drawings. Emphasis is given to the development of competencies related to the use of drafting equipment, the production of beginning level engineering drawings and the production of beginning level architectural drawings.

494740 Engineering/CAD I

Credit: 1 Grade Levels: 9-12

Engineering/CAD I focus on the knowledge and skills required to produce advanced level engineering drawings. Emphasis is given to the development of competencies related to solving drafting and design problems that require the individual to understand and apply a wide range of technical knowledge and critical-thinking skills. The course is designed to allow the student to produce drawings of mechanical parts, engineering diagrams, electronics, etc. as traditional drawings or as computer-aided drawings.

494760 Engineering/CAD II

Credit: 1 Grade Levels: 10-12

Engineering/CAD II focuses on the knowledge and skills required to produce advanced level engineering drawings. Emphasis is given to putting into practice real world experience related to solving problems that require the individual to understand and use various engineering software and techniques.

494750 Engineering/CAD Lab

Credit: 1 Grade Levels: 9-12

This production-based program is designed to allow for the development of skills and knowledge needed to execute a comprehensive engineering product.

495470 Engineering Design and Development – (CAPSTONE)

Credit: 1 Grade Levels: 11-12

In this course, students will work in teams of two to four to design and construct the solution to an engineering problem, applying the principles developed in the preceding four courses.

494010 ETE 1 (Introduction to Engineering and Technology, 9th grade)

Credit: .5 Grade Level: 9

Students will develop an understanding of the history of technology involving information and communication, construction, manufacturing, energy, power, transportation and how they can be used to solve technological problems.

494020 ETE 2 (Fundamentals of Engineering and Technology, 9th grade)

Credit: .5 Grade Levels: 9

Students will further their understanding of the of impact technology has on the modern world involving information and communication, construction, manufacturing, energy, power, transportation and how they can be used to solve technological problems.

495010 Human Body Systems (HBS)

Credit: 1 Grade Levels: 9-12

Students engage in the study of the processes, structures, and interactions of the human body systems. Important concepts in the course include: communication, transport of substances, locomotion, metabolic processes, defense, and protection. The central theme is how the body systems work together to maintain homeostasis and good health.

493960 Innovations in Science and Technology I

Credit: 1 Grade Levels: 9-12

This is a contextual-based course that introduces students to the core fundamental concepts of science and technology through authentic projects. Through these projects, students will develop an understanding of the relationship between the physical, biological and social world. Students will gain an understanding of the differences between science and technology, and learn that technology is a process for applying science

493970 Innovations in Science and Technology II

Credit: 1 Grade Levels: 9-12

This course uses the concepts learned from Course 1 to further develop students' problem-solving strategies and skills needed by the 21st-century workforce. Students will continue to explore emerging technologies and techniques in the context of addressing authentic projects.

493980 Innovations in Science and Technology III

Credit 1 Grade Levels 10-12

This course will examine the past, present and future impact of science and technology on culture, society and the environment. Students will explore how their predecessors worked to solve some problems that still exist today, and examine the potential of using modern technology to solve those problems.

493990 Innovations in Science and Technology IV

Credit 1 Grade Levels 10-12

This course will allow students to brainstorm, use invention, innovation, creativity, predictive analysis and use technology to solve real-world problems. Dimensions covered will include research and development, troubleshooting, experimentation, design failures, patents and trademarks, and design under constraints.

495480 Introduction to Engineering Design (IED)

Credit: 1 Grade Levels: 9-12

Introduction to Engineering Design is an introductory course that develops students' problem-solving skills, with emphasis placed on the concept of developing a 3D model or solid rendering of an object. Students focus on the application of visualization processes and tools provided by modern, state-of-the-art computer hardware and software.

495020 Medical Interventions (MI)

Credit: 1 Grade Levels: 9-12

Students investigate a variety of interventions involved in the prevention, diagnosis and treatment of disease as they follow the lives of a fictitious family. The course is a "How-To" manual for maintaining overall health and homeostasis in the body

as students explore how to prevent and fight infection; how to screen and evaluate the code in human DNA; how to prevent, diagnose and treat cancer; and how to prevail when the organs of the body begin to fail.

495000 Principles of the Biomedical Sciences (PBS)

Credit: 1 Grade Levels: 9-12

Student work involves the study of human medicine, research processes, an introduction to bioinformatics, and the use of computer science, mathematics, and information theory to model and analyze biological systems. Students investigate the human body systems and various health conditions including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases.

495490 Principles of Engineering (POE)

Credit: 1 Grade Levels: 9-12

Principles of Engineering is a broad-based survey course designed to help students understand the field of engineering and engineering technology and its career possibilities. Students will develop engineering problem-solving skills that are involved in postsecondary education programs and engineering careers. They will explore various engineering systems and manufacturing processes.

490160 Unmanned Aerial Systems (UAS) I

Credit: 1 Grade Levels: 9-12

Unmanned Aerial Systems spans the spectrum from the basics of aviation, safety and principles of flight to design and manufacturing, industry specific applications, troubleshooting and maintenance, regulations, and mission planning, execution and debriefing.

490170 Unmanned Aerial Systems (UAS) II

Credit: 1 Grade Levels: 10-12

Unmanned Aerial Systems II continues building on the foundational skills learned in UAS I. Students can earn the FAA 107 Remote Pilot Certificate by the end of the second level.

490180 Unmanned Aerial Systems (UAS) III

Credit: 1 Grade Levels: 11-12

Unmanned Aerial Systems III helps students prepare for drone-related career and entrepreneurial opportunities while serving as a capstone lab-based course.

490150 Unmanned Aerial Systems (UAS) Flex

Credit: 1 Grade Levels: 9-12

The UAS Flex course provides a foundational overview of the basics of aviation, safety and principles of flight, troubleshooting and maintenance, regulations, and mission planning, execution and debriefing as in UAS I; with the primary difference being the course is built around the use of a pre-made drone. Students will not be prepared to enter UAS II, or be prepared to take the FAA 107 exam. This course is an approved elective in multiple CTE pathways, and students will explore the industrial applications of drones in the specific pathway in which it is applied.

492670 Web Technologies

Credit: 1 Grade Levels: 9-12

Web Technologies is an exploration of all of the elements of good web page design. Students will begin by creating web pages using HTML, XHTML and CSS. Students will investigate several Adobe software packages to enhance web sites such as: Photoshop to create and edit graphics, Flash to create animations and web banners, Fireworks to create and optimize images for the web, and Premiere or other video/audio software to create and edit videos and audio. Students will focus on how to use web design software such as Dreamweaver to create websites. Students will also use multimedia equipment such as digital cameras and camcorders to add this rich media to websites. Students will complete several real-world applications such as Flash videos and web pages for the school or other organizations or businesses. Web Communication using Adobe Dreamweaver® (Associate) certification is encouraged