

Information Technology Computer Science Pathway Project

Request for Applications (RFA)



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I. INTRODUCTION

A. PURPOSE OF THIS REQUEST FOR APPLICATION

The New Mexico's Public Education Department (PED) is requesting proposals for the design and implementation of a fully developed, four-course-sequence, program of studies in the Information Technology (IT) Career Cluster.

The PED and the College and Career Readiness Bureau (CCRB) recognize the importance of computer science as a key twenty-first century skill that will support New Mexico employers and regional economic development. To support the development of more computer scientists, the PED has adjusted the licensure requirements for most computer science courses so that high school teachers, with endorsements in mathematics and/or basic science, can learn computer science and then teach it in their high school. Teachers with an 800 license are also eligible to teach computer science courses.

The CCRB is supporting and promoting the development of high-quality IT and computer science programs in high schools in New Mexico as part of a comprehensive career technical education curriculum. Funds from the Carl D. Perkins Career and Technical Education Act will be awarded to sites that develop and deliver programs of study that build student skills in high-need computer science pathways. A key feature of Perkins programs is supporting students who pursue non-traditional careers; funded programs will support inclusive recruitment to ensure that female students are encouraged to consider computer science careers.

B. INFORMATION TECHNOLOGY—COMPUTER SCIENCE PATHWAY PROJECT

The pathways being proposed for development and implementation in this Information Technology-Computer Science Pathway Project (IT-CS Project) are

- Network systems
 - Cisco Academy
- Information support and services
 - GenYES
- Programming and software development
 - Database design and programming: Oracle Academy
 - Programming and software development: Project Lead the Way (PLTW)

The IT-CS Project. This project will fund at least 12 sites in implementing a selected information technology program of study (POS) as described in Section C. Funded POS will focus on careers that build linkages to IT occupations for entry-level, technical, and

professional careers related to the design, development, support, and management of hardware, software, multimedia, and systems integration services.

Sites will receive funding for implementation and agree to the following:

- **TEACHERS.** Identify teachers who are available for training and professional development in each of the courses in the POS.
- Support the key elements of teacher training and professional development.
- **STUDENTS.** Set annual goals for student participation and performance in the courses.
- Support and prepare students to complete the corresponding POS capstone course and either the related Advanced Placement (AP) exam or a culminating project, as described below.
- **CURRICULUM AND MATERIALS.** Offer the sequence of courses in the chosen POS, as listed in Section C, beginning with the first course listed in the 9th grade in school year 2018–19.
- Plan to offer each course that follows in the sequence in the following years.
- Purchase required supplies and materials and pay for site licenses as needed from selected vendors.
- **PARTNERS.** Collaborate with community-based partners to support knowledge and skill development among teachers and students.
- Agree to collaborate with state and community stakeholders on related initiatives and/or community-based learning opportunities that further develop coding, programming knowledge, and skills by connecting teaching and learning to real world experiences and employability skills.
- Create your own partnership with a local affiliated college to provide alignment for a smooth transition from the high school POS to the postsecondary certification and degree program.

Computer science (CS) is important for economic and workforce development in New Mexico, and the PED seeks to increase the pipeline of highly qualified CS and IT teachers, available courses, and students taking these courses. The PED has identified four curricula that will help in providing these opportunities and build teacher knowledge: Cisco Academy, GenYES, Oracle Academy, and PLTW. Each curriculum provider will deliver the necessary training and support for teachers to facilitate successful student learning in the courses listed in the POS.

- **The Cisco Network Systems POS.** Students in this program of study will learn the skills in information and communication technology that lead to two industry-recognized certifications before graduation: <https://www.netacad.com> and <https://www.wastc.org>
- **The GenYES Information Support and Services POS.** Students in this program of study will be well-prepared to enroll in the AP computer science principles courses. GenYES: <https://www.genyes.org>
- **The Oracle Academy Database Design and Programming POS.** Students in this program of study will learn the skills to develop database-driven web

applications and sit for assessment in industry-recognized certifications. Oracle Academy: <https://academy.oracle.com/en/oa-web-overview.html>

- **Project Lead the Way (PLTW) POS.** This pathway offers a computer science program that includes two courses that are approved College Board AP classes. Teachers trained by PLTW become qualified to teach these courses at the AP level. <https://www.pltw.org/our-programs/pltw-computer-science>

A robust and effective POS relies on the curriculum provider, community and business partners, and postsecondary partners to support and help facilitate the design, implementation, and professional development required for success. The IT-CS Project is working with the New Mexico Computer Science Teachers Association to support the delivery of professional development and training for teachers in June 2018.

Community-based learning is an integral part and best practice of effective POS. The IT-CS Project is collaborating with partners to support the awarded schools:

- Cultivating Coders: <http://cultivatecoders.com/>
- Lab 29: <https://www.lab29.org/>
- Cyberpatriots: <https://www.uscyberpatriot.org>

Career Technical Student Organizations (CTSO). While community-based learning provides great opportunity for building employability skills and improving CS knowledge and skills, student participation in Career Technical Student Organizations (CTSO) is another important element for successful POS. The Career Technical Leadership Project at Eastern New Mexico University (ENMU) in Portales (<http://nmctso.com/>) will be available for professional development, training, and support in building a CTSO associated with the selected POS. Computer science options are provided by two CTSOs—Technology Students of America (TSA): <http://www.tsaweb.org/> and Skills USA: <https://www.skillsusa.org/>.

The IT-CS Project. The CCRB will select up to four schools to participate in each of the three IT-CS pathways in the inaugural IT-CS Project, taking into consideration the school's capacity to implement the courses.

The goal of the IT-CS Project is to increase the number of teachers and students across the state participating in high-quality IT pathways that support students in completing a four-year, high school POS and successfully transition into a postsecondary certification, degree, and career.

Funding Sources.

Federal:	Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV), 20 U.S.C. §§ 2301 <u>et seq.</u> as amended by PL. 109-270.
State:	2017 NM Laws, ch. 135 (General Appropriations Act of 2017)

C. SUMMARY OF APPLICATION

1. Network Systems Pathway: Cisco Network Systems

PROGRAM OF STUDY COURSE SEQUENCE FOR NETWORK SYSTEMS PATHWAY				
POS	9 th Grade	10 th Grade	11 th Grade	12 th Grade
Cisco Network Systems	0340 IT Essentials (CompTIA A+ certification prep)	0323 Computer Science/Programming	0341 CCNA Routing and Switching Part 1	0342 CCNA Routing and Switching Part 2
<p>Note: It is expected that a student completing the program of studies listed above will transition to postsecondary college and career able to comprehend and complete a degree or credential pathway, unless otherwise noted.</p>				

STARS No.	COURSE DESCRIPTIONS
0340	<p>IT Essentials: PC Hardware and Software is an introduction to computer components, laptops and portable devices, wireless connectivity, security, safety, environmental concerns, and diagnostic tools. In this course, students develop hands-on networking skills and understand the role networks play in our lives. This course introduces students to networking careers and prepares them for further study. Students learn how to plan and install a network using real equipment and connect it to the Internet, practice verifying and troubleshooting network and internet connectivity, learn how to recognize and mitigate security threats to a home network, configure common internet applications, set up sharing between computers, and configure basic Internet providers (IP) services.</p>
0323	<p>Computer Science/Programming provides the background knowledge and skills to construct computer programs in one or more languages. Computer coding and program structure are often introduced with the Java language, but other computer languages may be used instead. Initially, students learn to structure, create, document, and debug computer programs.</p>
0341	<p>CCNA Routing and Switching Part 1 is a gateway to entry-level networking jobs and IT careers. Part 1 curriculum consists of two units: Introduction to Networks and Routing and Switching Essentials. Students develop a working knowledge of routing and switching, network applications, protocols, and services. These first two units prepare students for the Cisco Certified Entry Networking Technician (CCENT) certification exam.</p>
0342	<p>CCNA Routing and Switching Part 2 is a continuation of 0341. Part 2 curriculum consists of two units: Scaling Networks and Connecting Networks. Students develop a working knowledge of routing and switching, network applications, protocols, and services. All four units are recommended for preparing students to take the Cisco Certified Network Associate Routing & Switching (CCNA) Routing and Switching certification exam.</p>

Note: The preceding descriptions are taken from the State of New Mexico's Student Teacher Accountability Reporting System (STARS).

The CCRB will select at least four school districts and up to two teachers per district to participate and support the implementation of the POS for Cisco Network Systems. Special consideration will be given based on academic needs, capacity to participate in all of the project events, and demonstrated commitment to the project agreements listed above.

Funds from the IT-CS Project—Cisco Network Systems Program of Study will be used to

- participate in the New Mexico Computer Science Professional Development Week at the University of New Mexico (UNM), June 4–8, 2018;
- attend a 5-day workshop at the New Mexico Computer Science Professional Development Week, June 4–8 to learn and understand the key elements, principles, and curriculum of the Cisco Network Systems program and IT essentials course;
- purchase items necessary to meet the technology requirements; and
- provide a stipend/differential to the new computer science teacher.

Additionally, selected teachers and their school leadership team will commit to the following:

- Plan for, recruit, and enroll a cohort of students for the entry-level course in the POS for 2018–19, with a special focus on recruiting female students
- Participate in the IT-CS Project community of practice virtual learning network and support sessions throughout 2019–20
- Collect evidence and document the learning process to share best practices with others in the region or the state
- Participate in data collection and research related to the project

Cisco Network Systems program implementation will begin with an in-depth, five-day workshop that will be provided by master trainers from the Western Academy Support and Training Center (WASTC). Teachers entering the training do not need to be certified as Career and Technical Education (CTE) or computer science teachers prior to training. They do need to be motivated and successful classroom teachers in math, science, a technology-related area, or the arts. After completing this five-day training, teachers will be able to access the WASTC curriculum, resources, and related tools to successfully teach the course content and facilitate and deliver the lessons.

Project Activities, Events, and Timeline—Project Year One, School Year 2017–18

1. Identify the teachers and support their professional development and training in the Cisco Networking Academy: *IT Essentials*' curriculum and tools.
2. Ensure teachers attend the New Mexico Computer Science Professional Development Week at UNM, June 4–8, 2018.
3. Identify and recruit students, who will be prepared to enroll in the IT Essentials course for 2018–19.

4. Collaborate with the curriculum provider and affiliated college for alignment of the Cisco Network Systems POS.

Anticipated Planning for Project Year Two, School Year 2018–19

1. Deliver and implement computer science/programming as an elective offering.
2. Identify and recruit students, who will be prepared for and enrolled in IT Essentials and computer science/programming for 2020–21.

Anticipated Planning for Project Year Three—School Year 2019–20

1. Deliver and implement IT Essentials and Computer Science/Programming as elective offerings.
2. Identify the teacher and support access to training for CCNA's Routing and Switching course.
3. Identify and recruit students who will be prepared for, and enrolled in, CCNA Routing and Switching in 2021–22.

Comprehensive List of Technology Necessary to Implementing the Curriculum

The following is a list of items each teacher must have available in order to teach the Cisco–IT Essentials curriculum. Much of the equipment, their parts and components (e.g., older PCs and related peripheral equipment), can be found in school districts' parts and support centers. School districts will use the funding from this RFA to help complete the classroom equipment needs.

Schools adopting IT Essentials—Lab PC Hardware Requirements

In order to be able to implement the different relationships between linked elements (topologies) that are used in the lab exercises of the IT Essentials curriculum, academies teaching the course are required to have, at a minimum, the following equipment:

- 1 CPU heat sink and cooling fan
- 1 DVD-ROM (minimum), DVDR, or BD/BDR
- 1 Ethernet card
- 1 Intel or AMD CPU, 1 gigahertz (GHz) or faster with support for PAE, NX, and SSE2
- 1 keyboard
- 1 mouse
- 1 PC case with 300W power supply
- 1 PCI-, PCIe-, or AGP-compatible motherboard
- 1 PCI, PCIe (recommended), or AGP video card
 - Direct X 9 graphics device with WDDM driver
- 1 super VGA (1024 X 768) or higher-resolution video monitor
- 2 gigabyte (GB) RAM (32-bit) or 4 GB RAM (64-bit) (2 X 1GB or 2 X 2GB suggested)
 - Some labs will require one module of RAM to be uninstalled or the simulation of a faulty module for troubleshooting purposes.
- 60 GB hard drive (minimum); 80 GB or more (recommended)

- The system must support a full install of Windows and two partitions of the same size.
- Cables to connect HDD/CD (quantities vary)

Additional Lab Equipment Required

In addition to the equipment specified above, the lab topologies of IT Essentials require the use of the following equipment and accessories:

- 1 internet connection for internet searches and driver downloads (this could be the instructor's workstation)
- 1 printer or integrated printer/scanner/copier for the class to share
- 1 wireless router with WPA2 support for the class to share
- 2 wireless network adapters (compatible with the above wireless router) for the class to share
- Various USB flash drives for moving files between computers in the labs

Lab PC Repair Tools

- Cable strippers
- Compressed air service canister (optional due to globally varying classroom health and safety laws)
- Electronics cleaning solution (optional)
- Electrostatic discharge (ESD) wrist strap and cord
- ESD mat with a ground cord
- Flashlight
- Hex Socket Drivers (various sizes) (optional)
- Lint-free cloth
- Modular cable tester
- Multimeter (optional)
- Network Loop back plugs (optional)
- Power supply tester (optional)
- RJ-45 crimpers
- Safety glasses
- Screwdriver, phillips
- Screwdriver, flathead
- Thermal compound
- Wire cutters

Smartphones and tablets are desirable for use with the labs in the Mobile Devices chapter. IT Essentials 6.0 content focuses on Microsoft Windows Vista, Windows 7, and Windows 8 and 8.1. Only one Microsoft operating system installation media is required to complete the curriculum labs. Microsoft offers programs for academic institutions to purchase software at a reduced cost. An example of such a program is DreamSpark, which can be found at <https://www.dreamspark.com>.

Webinar presentation and workshop for the Network Systems with the Cisco POS is scheduled for Wednesday, February 8, 2018 at 4pm.

Login details are available on the PED website, CCRB homepage.

New Mexico Public Education Department College and Career Readiness Information Technology— Computer Science Project	Budget for Network Systems: Cisco Networking Systems	
Applicant Name:		
Expense—School Year 2017–18	Budgeted Amount	
Paid directly to Western Academy Support and Training Center by district:		
Initial yearly support fee (\$300.00 per subsequent year)	\$550.00	
Instructor training	\$600.00	
Trainer professional fees, travel, lodging, and food	\$1,400.00	
Support to district for teacher professional development, travel, and technology expense:		
Teacher stipend/differential	\$1,800.00	
Subs (AP training, other training/collaboration)	\$750.00	
CS Summer Institute participation fee	\$150.00	
CS Summer Institute food and lodging (Food \$200.00 at Institute, lodging at \$100.00 per day)	\$675.00	
Equipment and supplies (a one-time expense)	\$4,000.00	
Total to school:		\$9,925.00
Note: This budget form contains details of all expenses to be paid with awarded funds for activities implemented at the high school during the grant year.		

Although not a guarantee, the PED anticipates funding to continue to support the implementation of this initiative for three consecutive years.

2. Information Support and Services Pathway: GenYES Program of Study

Program of Study Course Sequence for the Information Support & Services Pathway:				
POS	9 th Grade	10 th Grade	11 th Grade	12 th Grade
GenYes	0320 Computer Technology Assistant I	0321 Computer Technology Assistant II	0322 Computer Technology Assistant III	0336 AP Computer Science Principles

STARS No.	Course Descriptions
0320	Computer Technology Assistant I —Provides an essential introduction to GenYES, including GenYES basics information literacy, digital citizenship, and foundational software to ensure all students are informed on common software and practices. Elements of content creation are covered based on the need of the school’s IT community, including digital audio and video, digital art, web publishing, and game design. IT support is introduced, including hardware and software maintenance, troubleshooting and customer support, and supporting a 1:1 program.
0321	Computer Technology Assistant II —Provides continued knowledge and skill development in content creation from Computer Technology Assistant I. Further emphasis in content creation and IT support is developed in this course. Mentoring skills in the areas of online communication are developed by students. Students learn to “become the teacher”, creating tutorials and giving professional development workshops. In addition, students learn to develop leadership skills and the ability to work as a team.
0322	Computer Technology Assistant III —In year three of the GenYES program of studies, students continue to be engaged in content creation, IT support, and mentoring. In addition, they are working in advanced units related to creating 21 st century schools. Students develop and implement a community service plan for their school. Finally, students explore college and career options, find the right college, and locate sources of funding for college.
0336	AP Computer Science Principles —AP Computer Science Principles introduces students to the foundational concepts of computer science and challenges them to explore how computing and technology can impact the world. With a unique focus on creative problem solving and real-world applications, this course prepares students for college and career. It is intended to prepare students for the optional Advanced Placement Exam in this subject and should follow the published College Board guidelines.
	Note: The preceding descriptions are taken from the course descriptions with content provided by the curriculum provider.

The CCRB will select at least four school districts and up to two teachers per district to participate and support the implementation of the POS for the Information Support and Services Pathway. Special consideration will be given based on academic needs, capacity to participate in all of the project events, and demonstrated commitment to the project agreements listed above.

IT-CS Project GenYes Funds. Funds from this program of study will be used to

- participate in the New Mexico Computer Science Professional Development Week at the University of New Mexico (UNM), June 4–8, 2018;
- attend a two-day workshop at the New Mexico Computer Science Professional Development Week, June 4–5, 2018 to learn and understand the key elements, principles, and curriculum of the GenYES program. (GenYES is student centered and utilizes leadership and teaching skills for students; in addition to course instructor(s), consider selecting two to three student leaders to participate in this unique training workshop);
- purchase items necessary to meet the technology requirements; and
- provide a stipend/differential to the new computer science teacher.

Additionally, selected teachers and their school leadership team will commit to the following:

- Plan for, recruit, and enroll a cohort of students for the entry-level course in the POS for 2018–19, with a special focus on recruiting female students.
- Participate in the IT-CS Project community of practice virtual learning network and support sessions throughout 2019–20.
- Collect evidence and document the learning process to share best practices with others in the region or the state.
- Participate in data collection and research related to the project.

GenYES program implementation starts with an in-depth, two-day workshop provided by the developers of the curriculum, along with successful student technology leaders from local or regional schools. Upon completion of the training, teachers are able to access the curriculum, resources, and related tools to successfully support and design lessons and teach the course content.

Project Activities, Events, & Timeline—Project Year One, School Year 2017–2018

1. Identify the teachers and support their professional development and training in the GenYES curriculum and tools.
2. Teachers attend the New Mexico Computer Science Professional Development Week at UNM, June 4–8, 2018.
3. Identify and recruit students who will be prepared for, and identified as, computer technology assistants for 2018–19.
4. Collaborate with the curriculum provider and affiliated college for alignment of the GenYES POS.

Anticipated Planning for Project Year Two, School Year 2018–2019

5. Deliver and implement Computer Technology Assistant I as an elective offering.
6. Identify and recruit students who will be prepared for, and enrolled in, Computer Technology Assistant I and II for 2020–21.

Anticipated Planning for Project Year Three, School Year 2019–2020:

7. Deliver and implement Computer Technology Assistant I and II as elective offerings.
8. Identify and recruit students who will be prepared for, and enrolled in, AP Computer Science Principles in 2021–22.

Comprehensive List of Technology Needed to Implement the Curriculum:

The following is a list of items you will need to have available to deliver the GenYES curriculum. The software listed are free and/or open source and can be used to progress through the curriculum. You can use AlternativeTo (<http://alternativeto.net/>) to find applications that will fit your specific needs.

- Audio Editing Software—e.g., Audacity
- AUP. Your school's acceptable use policy on student downloads, site blocking, passwords, social media, etc. for careful communication and understanding among all staff and GenYES student teacher leaders, as they work with other students and support teachers throughout the school as part of their project-based learning experiences
- Digital camera (or smartphone capability)
- Digital video camera (or smartphone capability)
- Disposable email service. For situations where students are not allowed to create their own email accounts, use a disposable email service, e.g., Guerrilla Mail (<https://www.guerrillamail.com/>)
- Email accounts. Student email accounts for signing up to external sites (**Note:** you can always use a temporary email)
- Graphic editing software—e.g., Krita, GIMP
- Internet connection, reliable and fast
- Microphone
- Old computer parts (preferably a desktop)
- Presentation software—e.g., Google Slides, OpenOffice Impress
- Spreadsheet software—e.g., Google Sheets, OpenOffice Calc
- Telepresence software (cloud or web-based)—e.g., Google Hangouts, Skype
- Video editing software—e.g., OpenShot
- Word processing software—e.g., Google Docs, OpenOffice Writer

Webinar presentation and workshop for the Information Support and Services with the GenYES Program is scheduled for Wednesday, February 7, 2018 at 2:45pm. Login details are available on the PED website, CCRB homepage.

New Mexico Public Education Department College and Career Readiness Information Technology—Computer Science Project		Budget for Information Support & Services: GenYES POS
Applicant Name:		
Expense—School Year 2017–2018		Budgeted Amount
Paid directly to GenYES by district:		
First year annual license fee for GenYES*		\$2,975.00
Professional services fee to GenYES (2 days) one-time fee for teacher training, including travel and expenses		\$1,000.00
Support to district for teacher professional development, travel, and technology expenses:		
Teacher stipend/differential		\$1,800.00
Subs (AP training, other training/collaboration)		\$750.00
CS Summer Institute participation fee		\$150.00
CS Summer Institute food and lodging (Food \$200.00 at institute, lodging at \$100.00 per day)		\$675.00
Equipment and supplies (a one-time expense)		\$3,000.00
Total to school:		\$10,350.00
Note: This budget form contains details of all expenses to be paid with awarded funds for activities implemented at the high school during the grant year.		

**Although not a guarantee, the PED anticipates funding to continue to support the implementation of this initiative for three consecutive years. The table below shows the anticipated expenses for sustainability and successful implementation of the IT-CS Project.*

Anticipated Expense, School Year 2018–2019		Budgeted Amount
Paid directly to GenYES by district:		
Annual License fee for GenYES		\$500.00
Total to school:		\$500.00

3. Programming and Software Development Pathway—Oracle Academy

Program of Study Course Sequence for Programming and Software Development Pathway:				
POS	9 th Grade	10 th Grade	11 th Grade	12 th Grade
Oracle Academy	0314 Data Systems/ Processing— Database Foundations	0330 Database Design and Programming	0331 Database Programming with SQL	0395 Application Development Foundations

STARS No.	Course Descriptions:
0314	Data Systems/Processing—Database Foundations. This course introduces students to basic relational database concepts. It teaches students relational database terminology, as well as data modeling concepts, building Entity Relationship Diagrams (ERDs), and mapping ERDs. Oracle SQL Developer Data Modeler is utilized to build ERDs, and Structured Query Language (SQL) is used to interact with a relational database and manipulate data within the database. Oracle Application Express (APEX) is utilized to provide practical, hands-on, engaging activities. Leveraging project-based learning techniques, students create and work with projects that challenge them to design, implement, and demonstrate a database solution for a business or organization.
0330	Database Design & Programming— This course of study teaches students to analyze complex business scenarios, design and create data models, and create databases using SQL. Oracle SQL Developer Data Modeler and APEX are utilized to provide practical, hands-on activities. Leveraging project-based learning techniques, students create and work with projects that challenge them to design, implement, and demonstrate a database solution for a business or organization.
0331	Database Programming with PL/SQL— This course of study introduces students to PL/SQL, Oracle’s procedural extension language for SQL and the Oracle relational database. Participants explore the differences between SQL and PL/SQL and explore how PL/SQL is used to extend and automate SQL in administering the Oracle database. APEX is utilized to provide practical, hands-on, engaging activities. Leveraging project-based learning techniques, students create and work with projects that challenge them to enhance the SQL of a database solution for a business or organization.
0395	Computer and Information Sciences—Application Development Foundations. This course introduces students to the techniques and tools required to develop database-driven web applications. The course teaches students how to design, develop, and deploy beautiful, responsive, database-driven web applications using APEX. APEX is utilized to provide practical, hands-on, engaging activities. Leveraging project-based learning techniques, students create and work with projects that challenge them to design, implement, and demonstrate a database-driven web application solution for a business or organization.
Note: The preceding descriptions are taken from the course descriptions, with content provided by the curriculum provider.	

At least four school districts, and up to two teachers per district, will be selected to participate and support the implementation of the POS for the Programming and Software Development Pathway. Special consideration will be given based on academic needs, capacity to participate in all project events, and demonstrated commitment to the project agreements listed above. The selected teachers, with their school leadership, will commit to the following:

- Attend workshops with Oracle Academy master teacher trainers to learn the key elements, principles, and curriculum of Oracle Academy Database Design and Programming courses to support the implementation of high-quality IT-CS courses for their students
- Provide access to the minimum recommended technology for students to fully engage in the curriculum. Funds provided in the budget below can be used to offset necessary purchases to meet minimum specifications.
- Create a CTSO as an intra-curricular program to support the community-based learning and skill development along with leadership and employability skills for students
- Participate at the IT-CS summer institute sponsored by the State Computer Science Teachers Association at the University of New Mexico, June 4–8, 2018.
- Plan for, recruit, and enroll a cohort of students for the entry-level course in the POS for 2018–19, with a special focus on recruiting female students
- Participate in the IT-CS Project community of practice virtual learning network and support sessions throughout 2018–19
- Collect evidence and document the learning process to share best practices with others in the region or the state
- Participate in associated data collection and research related to the project
- Facilitate the industry certification, database junior certification for all students in the Database Foundations course, using funds provided in the budget to offset student costs for the assessment
- Provide a stipend/differential to the new computer science teacher as included in the budget detailed in the Appendix

Oracle Academy provides professional development and training for classroom teachers in the curriculum and course tools before they begin to teach through their own master teachers. This training is delivered in five days for each of the courses.

Project Activities, Events, and Timeline—Expected Project Year One, School Year 2017–2018:

1. Identify teachers and support their professional development and training in Oracle’s data systems/processing—Database Foundations
2. Become a member of Oracle Academy at no cost
3. Course instructors attend Oracle Academy professional development, June 4–8, 2018 during the Computer Science Summer Institute at the UNM campus
4. Identify and recruit students for data systems/processing—Database Foundations for 2019–20

5. Collaborate with the curriculum provider and affiliated college for alignment of the computer science POS
6. Collaborate with a community-based learning organization for developing opportunities for students to further develop skills and experiences
7. Form a CTSO, Technology Students of America (TSA), or Skills USA as a co-curricular program to support the Computer Science Pathway.

Anticipated Planning for Project Year Two, School Year 2018–2019:

8. Identify teachers and support their professional development and training in Oracle—Database Design and Programming.

Anticipated Planning for Project Year Three, School Year 2019–2020:

9. Deliver data systems/processing—Database Foundations as an elective offering
10. Deliver Database Design and Programming as an elective offering
11. Identify and recruit a teacher in the school community who will train and participate in professional development for Oracle—Database Programming with SQL.
12. Plan for the delivery of Database Programming with SQL as an elective offering in 2021–22

Assessment for industry-recognized certification, database junior certification upon completion of the Database Foundations course:

http://education.oracle.com/pls/web_prod-plq-dad/db_pages.getpage?page_id=652&get_params=p_exam_id:1Z0006

Webinar presentation and workshop for the Database Design and Programming with Oracle Academy Program is scheduled for Thursday, February 8, 2018 at 2:45pm. Login details are available on the PED website, CCRB homepage.

New Mexico Public Education Department College and Career Readiness Information Technology Computer Science Project		Budget for Programming and Software Development: Database Design and Programming— Oracle POS
Applicant Name:		
Expense School Year 2017–2018		Budgeted Amount
Paid directly to Oracle by district:		
Assessment costs for Database Junior Certification (for up to 20 students)		\$2,250.00
Support to district for teacher professional development expense:		
Teacher stipend/differential		\$1,800.00
Subs (AP training, other training/collaboration)		\$750.00
CS Summer Institute—participation fee		\$150.00
CS Summer Institute—food, lodging (Food \$200.00 at institute, lodging at \$95.00 per day)		\$675.00
Equipment and supplies (a one-time expense)		\$6,000.00
Total to school:		\$11,625.00
Note: This budget form contains details of all expenses to be paid with awarded funds for activities implemented at the high school during the grant year.		

Although not a guarantee, the PED anticipates funding to continue to support the implementation of this initiative for three consecutive years. The table below shows the anticipated expenses for sustainability and successful implementation of the IT-CS Project.

Anticipated Expense School Year 2018–2019		Budgeted Amount
Paid directly to Oracle by district:		
Assessment costs for Database Junior Certification per student x \$87.00/ per student		Per school needs
Support to district for teacher professional development expense:		
Teacher training for Database Design and Programming		No Charge
Total to school:		To be determined

4. Programming and Software Development—Project Lead the Way PLTW

Program of Study Course Sequence for Programming and Software Development—PLTW				
POS	9 th Grade	10 th Grade	11 th Grade	12 th Grade
Computer Science and Cybersecurity—PLTW	0344 PLTW—Computer Science Essentials	0345 PLTW—Computer Science Principles	0346 PLTW—Computer Science A	0347 PLTW — Cybersecurity

STARS No.	Course Descriptions:
0344	PLTW—Introduction to Computer Science (ICS). This half credit course is designed to be the first computer science course for students who have never programmed before. ICS is an optimal starting point for the PLTW computer science program. Students work in teams to create apps for mobile devices using MIT APP Inventor®. They explore the impact of computing in society and build skills in digital citizenship and cybersecurity. Beyond learning the fundamentals of programming, students build computational thinking skills by applying computer science to collaboration tools, modeling and simulation, and data analysis. In addition, students transfer the understanding of programming gained in App Inventor to text-based programming in Python® and apply their knowledge to create algorithms for games of chance and strategy (a “PLTW” course).
0345	PLTW—Computer Science Principles (CSP). Using Python® as a primary tool and incorporating multiple platforms and languages for computation, this course aims to develop computational thinking, generates excitement about career paths that utilize computing, and introduces professional tools that foster creativity and collaboration. While this course can be a student's first in computer science, students without prior computing experience are encouraged to start with ICS. CSP helps students develop programming expertise and explore the workings of the Internet. Projects and problems include app development, visualization of data, cybersecurity, and simulation. The course curriculum is a College Board approved implementation of AP CS Principles and serves as the beginning course for PLTW Computer Science (a “PLTW” course).
0346	PLTW—Computer Science A. This course focuses on further developing computational thinking skills through the medium of Android™ App development for mobile platforms. The course utilizes industry-standard tools such as Android Studio, Java™ programming language, XML, and device emulators. Students collaborate to create original solutions to problems of their own choosing by designing and implementing user interfaces and Web-based databases. This course aligns with the AP CS A course. This course is sequenced after PLTW Computer Science Principles 0345 (a “PLTW” course).
0347	PLTW—Cybersecurity introduces the tools and concepts of cybersecurity and encourages students to create solutions that allow people to share computing resources while protecting privacy. Nationally, computational resources are vulnerable and frequently attacked; in Cybersecurity, students solve problems by understanding and closing these vulnerabilities. This course raises students’ knowledge of, and commitment to, ethical computing behavior. It also aims to develop students’ skills as consumers, friends, citizens, and employees who can effectively contribute to communities with a dependable cyber infrastructure that moves and processes information safely. This course is sequenced after PLTW Computer Science A 0346 (a “PLTW” course).
Note: The preceding descriptions are taken from the State of New Mexico’s Student Teacher Accountability Reporting System (STARS).	

At least four school districts, and up to two teachers per district, will be selected to participate and support the implementation of the POS for the Programming and Software Development—PLTW Pathway. Special consideration will be given based on academic needs, capacity to participate in all project events, and demonstrated commitment to the project agreements. The selected teachers, with their school leadership, will commit to the following:

- Attend workshops with PLTW CS master teacher trainers to learn the key elements, principles, and curriculum of PLTW computer science to support the implementation of high-quality IT-CS courses for their students
- Provide access to the minimum recommended technology for students to fully engage in the curriculum. Funds provided in the budget section can be used to offset necessary items required to meet minimum specifications.
- Create a CTSO as an intra-curricular program to support community-based learning and skill development along with leadership and employability skills for students
- Participate at the IT-CS summer institute sponsored by the State Computer Science Teachers Association at the University of New Mexico, June 4–8, 2018
- Plan, recruit, and enroll a cohort of students for the entry level course in the POS for 2018–19, with a special focus on recruiting female students
- Participate in the IT-CS Project community of practice virtual learning network and support sessions throughout 2018–19
- Collect evidence and document the learning process to share best practices with others in the region or state
- Participate in associated data collection and research related to the project
- Provide a stipend/differential to the new computer science teacher as included in the budget detailed in the Appendix.

PLTW relies on postsecondary partners in states to support and help facilitate the professional development delivered by PLTW master trainers. In addition, teachers of the Essentials Course, the entry class in the POS, are trained through a unique online portal that supports teachers throughout the first year of implementation.

Project Activities, Events, and Timeline—Project Year One, School Year 2017-2018:

1. Identify teachers and support their professional development and training in PLTW—Computer Science Essentials
2. Attend PLTW trainings, June 4–8, 2018 (at the CS Summer Institute) and June 11–15, 2018 at the UNM campus
3. Identify and recruit students who will be prepared for, and enrolled in, Computer Science Essentials for 2019–20
4. Collaborate with the curriculum provider and affiliated college for alignment of the computer science POS and college credit acceptance of the AP score

5. Collaborate with a community-based learning organization to create opportunities for students to develop their skills and gain experience
6. Form a CTSO, TSA, or Skills USA as a co-curricular program to support the computer science pathway in their schools

Anticipated Planning for Project Year Two, School Year 2018–2019:

7. Deliver Computer Science Principles as an elective offering
8. Support teacher professional development and delivery of the Computer Science Essentials as an elective offering. PLTW provides online professional development and support during the school year.
9. Identify and recruit a teacher to be trained for PLTW—Computer Science A
10. Identify and recruit students who will be prepared for, and enrolled in, Computer Science A for 2020–21
11. Promote and facilitate the delivery of the AP exam to students in the Computer Science Principles course

Anticipated Planning for Project Year Three, School Year 2019–2020:

12. Deliver Computer Science Principles as an elective offering
13. Deliver Computer Science Essentials as an elective offering
14. Deliver Computer Science A as an elective offering. PLTW staff will provide professional development during the summer of 2020 at a host site (to be determined) in the region. This training will be a five-day commitment.
15. Promote and facilitate the delivery of the AP exam to students in the CS Principles course
16. Promote and facilitate the delivery of the AP exam to students in the Computer Science A course

PLTW Computer Science Technology Specifications:

- Android tablets and computers (laptop or desktop) are required.
 - Android tablets are required for each teacher (1:1 ratio) and no more than at a 2:1 ratio for students.
 - A computer (laptop or desktop) is required for each teacher and each student (1:1 ratio)
 - iPads are not supported for use in PLTW computer science coursework
- A digital projector with screen and appropriate cables/adapters to connect the teacher laptop to the projector

Webinar presentation and workshop for the Programming and Software Development with Computer Science and Cybersecurity Project Lead the Way Program is scheduled for Thursday, February 7, 2018 at 4pm. Login details are available on the PED website, CCRB homepage.

NM Public Education Department College and Career Readiness Information Technology—Computer Science Project		Budget for Programming and Software Development Computer Science and Cybersecurity— PLTW POS
Applicant Name:		
Expense School Year 2017–2018		Budgeted Amount
Paid directly to PLTW by district:		
Equipment and supplies (a one-time expense)		\$3,500.00
Annual participation fee (due each year PLTW is taught)		\$2,000.00
Professional development registration (a one-time fee for teacher training in Computer Science Principles)		\$2,400.00
Support to district for teacher professional development expense:		
Teacher stipend/differential		\$1,800.00
Subs (AP training, other training/collaboration)		\$750.00
CS Summer Institute participation fee		\$150.00
CS Summer Institute—food, lodging (Food \$200.00 at institute, lodging at \$95.00 per day)		\$675.00
Total to school:		\$11,275.00
Note: This budget form contains details of all expenses to be paid with awarded funds for activities implemented during the grant year.		

Although not a guarantee, the PED anticipates funding to continue to support the implementation of this initiative for three consecutive years. The table below shows the anticipated expenses for sustainability and successful implementation of the IT-CS Project.

Anticipated Expense Beginning School Year 2018–2019	Budgeted Amount
Paid directly to PLTW by district:	
Equipment and supplies (CS Essentials)	\$300.00
Equipment and supplies (a one-time expense for CS Principles)	\$750.00
Annual participation fee (due each year PLTW is taught)	\$2,000.00
Professional development registration (a one-time fee for teacher training)	\$2,400.00

D. SCOPE OF APPLICATION

The following are of fundamental relevance:

1. **Length of Funding:** Funding for this application is for fiscal year 2017–18 (FY18). The resulting award shall begin on April 1, 2018, or as soon as possible thereafter, and will remain in effect until June 30, 2018.
2. **Level of Funding:** Based on research, partnership, and commitment of support with the particular pathway program, selected high schools will be awarded funds to meet the expenses for FY18 as described in budgets, presented in Section I.
3. **Eligible Entities:** An eligible entity may be a public local education agency (LEA), including districts and state-supported charter schools.
4. **Criteria for Targeted Schools:** The PED is especially seeking eligible entities who serve students attending struggling (D or F) schools in low-income areas, rural areas, and non-or limited- Carl D. Perkins funded LEAs.

II. CONDITIONS GOVERNING THE APPLICATION

A. SEQUENCE OF EVENTS

The application manager will make every effort to adhere to the following schedule:

	Action	Responsible	Date
1.	Issuance of application	Agency	January 25, 2018
3.	Submission of application (Due Date)	Applicant	March 1, 2018
4.	Proposal evaluation	Evaluation committee	March 8, 2018
5.	Issuance of award letter	Agency	March 30, 2018

B. EXPLANATION OF EVENTS

The following paragraphs describe the activities listed in the sequence of events:

1. **Issuance of application:** This application is being issued by the New Mexico PED, College and Career Readiness Bureau. The application may be viewed at ped.state.nm.us/ped/rfps.html and downloaded.

2. **Submission of applications:** All applications must be received for review and evaluation by the College and Career Readiness Bureau no later than 5 p.m. Mountain Standard Time on March 1st, 2018. Applications must be delivered electronically to Maggie.Morrow@state.nm.us An acknowledgement will be delivered in response via an email message.
3. **Proposal evaluation:** An evaluation committee, appointed by the PED, will evaluate applications.
4. **Issuance of award letter:** Applicants will be notified of award status via letter.

III. RESPONSE AND ORGANIZATION

A. Number of Copies

Applicants will submit **one original** application via email to the application manager on or before the closing date designated for receipt of applications (i.e., 3/8/18).

B. APPLICATION FORMAT

1. Typewritten. 12-point font, no font style specification
2. On standard 8 ½ x 11 paper
3. Double-spaced with 1-inch margins; single-sided in a portrait setting
4. **15-page maximum for the narrative response**; the page limitation includes the Executive Summary, but does not include the Appendices.

C. APPLICATIONS SHOULD INCLUDE THE FOLLOWING

1. **Information Sheet.** Applicants must complete and submit Appendix A.
2. **Narrative.** The narrative (excluding attachments) cannot exceed 15 pages.
 - a. Executive summary: In 500 words or fewer:
 - i. Identify your reasons for applying for the IT-CS Project—the “why”
 - ii. Identify the POS pathway program you are applying for: Information Support and Services, Database Design and Programming, or Programming and Software Development
 - b. Detailed overview of your school’s IT-CS Project:
 - i. Include how implementing the selected IT Cluster POS will improve career outcomes for students and your local economic community

- ii. Describe how the selected POS will be supported within your school's master schedule; how will students and teachers be recruited for the courses?
 - iii. Describe the license and related experience in computers and computer science of your selected teacher
 - iv. Describe how you will overcome the challenges to implementing your selected IT Cluster POS within your school or district system
 - v. Describe your school's vision as to how the selected IT Cluster POS will allow your learning community to better address the needs of your students
- c. Improvement and Accountability:
- i. Demonstrate the need for implementing the IT-CS Project through a review and analysis of:
 1. Achievement
 2. Graduation
 3. College and work readiness data
 - ii. Describe how your school's selected IT Cluster POS will impact students through participating in an AP assessment and/or an appropriate and aligned industry certification
 - iii. Describe how teacher participation in workshops and implementation of the selected IT Cluster POS will effect positive change and growth for the school
 - iv. Describe how the implementation of the selected IT Cluster POS will meet the needs and interests of your student population
 - v. Applicants should include a baseline analysis (if appropriate), interim goals, and final goals for the pilot year for each of the three intermediary outcomes:
 1. Participation in CTSO
 2. Student enrollment in selected IT Cluster POS courses
 3. Student performance in selected IT Cluster POS courses
- d. Logistics: Describe how the district is committed to inclusion of the selected IT Cluster POS courses into their master schedule and in recruiting and retaining teachers and students in these courses.
- i. Provide estimates of the number of students who will be served in your IT Cluster POS in 2018–19, 2019–20, and 2020–21
 - ii. Provide an overall view of programs of study that are currently being supported and promoted in your school's master schedule

D. Application Manager

The PED designates an application manager, who is responsible for the execution of this application. All completed applications should be addressed to the PED contact as follows:

Maggie Morrow
Deputy Director
College and Career Readiness Bureau, Public Education Department
Email: Maggie.Morrow@state.nm.us
Phone: (505) 827-6420

Any inquiries or requests regarding this application should be submitted to the PED contact—Deputy Director, Maggie Morrow—in writing via email with “IT-CS Cluster Project RFA Question” in the subject line.

IV. EVALUATION

A. EVALUATION POINT TABLE

see Appendix B

B. Evaluation Process

The evaluation process will follow these steps:

- 1. Committee Members.** The CCRB will determine the evaluation committee. Possible committee members may include PED or other governmental personnel and representatives from workforce or industry.
- 2. Review.** Committee members will review all applications for compliance with the mandatory specifications stated within the RFA.
- 3. Final Selection.** Committee members will evaluate applications based on the factors with assigned point values, see Appendix B. The committee members will select applicants with the highest scores as finalists.

APPENDICES

APPENDIX A—IT CS PROJECT INFORMATION SHEET

Information Technology—Computer Science Project Information Sheet

We are applying for the following pathway program of study: (circle one)

Networking Systems:

Cisco

Information Support and Services:

GenYES

Programming and Software Development:

Database Design and Programming-Oracle

Computer Science and Cybersecurity

Name of Applying District and High School(s)

District Address

City		County		District Telephone
District Administrator	Name	Office Phone	Cell Phone	Email
School Principal	Name	Office Phone	Cell Phone	Email
CS-IT Teacher	Name	Office Phone	Cell Phone	Email
CS-IT Teacher	Name	Office Phone	Cell Phone	Email
CS-IT Teacher Leader	Name	Office Phone	Cell Phone	Email

Project Agreement and Memorandum of Understanding:

By signing here, the district commits to activities and events described above and to follow the timeline described in this document.

District Administrator	Name	Signature
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APPENDIX B—IT CS PROJECT INFORMATION EVALUATION SHEET

Information Technology—Computer Science Project Evaluation		
Application Evaluation Factors: Each factor is assigned a numerical value. Failure to address an evaluation factor will result in a zero score for that factor and will negatively impact the application.		
Criteria	Possible Points	Awarded Points
Executive Summary: These points are based on the following criteria:	100	
1. The applicant's ability to concisely convey the "why" for implementing a POS in the IT Career Cluster and how it will improve school outcomes	25	
2. An overview of anticipated opportunities and challenges of implementing an IT POS in your school and district systems	25	
3. The description of how an IT POS will allow your learning community to better address the needs of your students in order to meet school-wide goals	25	
4. A description of the license and related experience in computers and computer science of your selected teacher.	25	
Improvement & Accountability: These points are awarded on the following criteria:	50	
5. Analysis of school data to support the need for implementing an IT Cluster POS. The application should demonstrate how the IT-CS Project will impact students through participating in an AP assessment and/or an appropriate and aligned industry certification. Describe the community-based learning and intra-curricular experiences your students will have available to them.	50	
Logistics: These points are awarded on the following criteria:	50	
6. Demonstrate how the district and school are committed to inclusion of the selected IT Cluster POS courses into their master schedule and in recruiting and maintaining teachers and students in these courses.	25	
7. An overall view of programs of study that are currently being supported and promoted in your school's master schedule	25	
<i>Note: More points will be awarded to schools with fewer existing POS.</i>		
Total Points:	200	

Application Ranking: _____ out of: _____

APPENDIX C

1: Cisco Materials and Information

IT Essentials Curriculum Alignment:

<https://drive.google.com/file/d/1tc5cE4UO-hSoTWHEXRMoc21CRol7yoIN/view?usp=sharing>

IT Essentials 6.0 Scope and Sequence:

<https://drive.google.com/file/d/1OQtXDbm6jshFICVOyhshZdeh-1PXX8es/view?usp=sharing>

CCNA Routing and Switching Scope and Sequence:

https://drive.google.com/file/d/1RUfMbDXXRNYP_037D0WTH6Vj5kuj1U5o/view?usp=sharing

2: GenYES Materials and Information

Curriculum Overview:

https://drive.google.com/file/d/1Grz8nr9SFZ5gAIP_reG8Y9Pa2dxylcAY/view?usp=sharing

Facilitators Guide to the GenYES Curriculum:

<https://drive.google.com/file/d/16mNyGgxzyn0lbcc4zY37uTbqTnSEFS4K/view?usp=sharing>

AP Computer Science Principles, course and exam description:

https://drive.google.com/open?id=1lcw8gXypknh1oZpQ6dMTydcuFjpFI_fO

3: Oracle Materials and Information

Oracle Academy Brochure:

<https://drive.google.com/file/d/1uWGdKEbXM7z0GaIYfdjMFfG1fKffW46i/view?usp=sharing>

Database Foundations Course Description, Overview, Curriculum:

<https://drive.google.com/file/d/1VnTmTc2wounYp94DdibBptxju6jQAKnZ/view?usp=sharing>

Database Design and Programming with SQL Course Description, Overview, Curriculum:

<https://drive.google.com/open?id=1VnTmTc2wounYp94DdibBptxju6jQAKnZ>

Database Programming with PL/SQL Course Description, Overview, Curriculum:

<https://drive.google.com/file/d/1VnTmTc2wounYp94DdibBptxju6jQAKnZ/view?usp=sharing>

Application Development Foundations Course Description, Overview, Curriculum:

<https://drive.google.com/open?id=1DdwI1R20bSI6FHlaDJvEWN0DZ6B-KkWf>

4: PLTW Materials and Information

Computer Specifications:

<https://drive.google.com/file/d/1xcHZVzI170ZwWnuend6efq3v3xbNSI22/view?usp=sharing>

PLTW Computer Science—Computer Science Essentials Course Outline:

<https://drive.google.com/file/d/1VnTmTc2wounYp94DdibBptxju6jQAKnZ/view?usp=sharing>

PLTW Computer Science—Computer Science Principles Course Outline:

<https://drive.google.com/open?id=1VnTmTc2wounYp94DdibBptxju6jQAKnZ>

PLTW Computer Science—Computer Science A Course Outline:

https://drive.google.com/file/d/1_Ig_BsO9PZVsU31RzvAoD8mxul9auqat/view?usp=sharing