Computer Information Systems ASSOCIATE OF ARTS *or* CERTIFICATE OF ACHIEVEMENT

Students satisfactorily completing the following required courses will be eligible for the **AA degree** and the **Certificate of Achievement in Computer Information Systems**. Confer with a counselor or the dean concerning the specific pattern of requirements for this program and refer to the Degrees and Programs section of the Catalog for information on the Associate in Arts degree.

Computers are everywhere and impact many of our daily activities. Our lives are dependent on information from a computer. Computer skills are a necessity in today's technological world.

The CIS program at College of Alameda prepares you for entry-level business opportunities requiring the use of computer applications, such as word processing, spreadsheet, database management, and geographical information systems (GIS) programs. Our CIS program prepares you for transfer to a university. Advanced students take programming courses, help desk and networking courses, and web publishing courses.

We offer beginning and advanced office application courses. We are the only Peralta college to offer help desk (desktop support technician) courses and networking courses. Our web publishing courses, offered as hybrid (with some face to face meetings) as well as online, lead to a certificate of proficiency upon successful completion of the courses. We also offer other online CIS courses which can fit your busy schedule.

Career Opportunities

The Computer Information Systems (CIS) program prepares students for entry level business positions requiring the use of computer applications, and will qualify students in the use of word processing, spreadsheet and database management applications. More advanced students may enroll in telecommunications and computer networking courses. In some instances, students with work experience in the above mentioned areas may challenge courses based on that experience. Students seeking advanced placement must meet with an instructor to verify knowledge and skills.

Program Learning Outcomes

Upon completion of this program a student will be able to:

- Develop an understanding of the problems and issues confronting individuals and society in general in the use of computers
- Analyze problems and design solutions using the program life cycle concept, HIPO charts, and program logic flowcharts
- Use and write simple Visual Basic code
- Create presentation-quality charts of several types

Degree Major/Certificate Requirements

DEPT/NO.	TITLE	UNITS
CIS 1 ***or*** CIS 5	Introduction to Computer Information Systems (4) ***or*** Introduction to Computer Science (5)	4-5
CIS 40	Database Management	4
CIS 42	Spreadsheet Applications	4
BUS 238A ***or*** CIS 238A	Word Processing I (3) ***or*** Word Processing I (3)	3

Select a minimum of 9-10 units from the following:

BUS 238B ***or*** CIS 238B	Word Processing II (3) ***or*** Word Processing II (3)	9-10
CIS 23	C# Programming (4)	
CIS 25	Object-Oriented Programming Using C++ (4)	
CIS 36A	Java Programming Language I (4)	
CIS 36B	Java Programming Language II (4)	
CIS 39A	UNIX/LINUX Operating System (4)	
CIS 97A	Oracle SQL and PL/SQL (4)	
CIS 209	Introduction to Windows (1)	
CIS 234A	World Wide Web Publishing I (2)	
CIS 234B	World Wide Web Publishing II (2)	
CIS 234D	Web Authoring (2)	
CIS 234E	Creating an E-Commerce Web Site (2)	
CIS 239	Help Desk Tools and Techniques (2)	

Total Required Units: 24-26

Desktop Support Technician CERTIFICATE OF ACHIEVEMENT

Students satisfactorily completing the required courses in the following certificate options will be eligible for the **Certificate of Achievement.** Confer with a counselor or the division dean concerning the specific pattern of requirements for these programs.

Certificate of Achievement Requirements

DEPT/NO.	TITLE	UNITS
CIS 1	Introduction to Computer Information Systems	4
CIS 201	Introduction to Computer Hardware	4
CIS 226A	Desktop Support Technician I	3
CIS 226B	Desktop Support Technician II	3
CIS 239	Help Desk Tools and Techniques	2
	Total Required Units:	**16**

Web Publishing CERTIFICATE OF PROFICIENCY

Students satisfactorily completing the required courses in the following certificate options will be eligible for the Certificate of Proficiency. Confer with a counselor or the division dean concerning the specific pattern of requirements for these programs.

Certificate of Proficiency Requirements

DEPT/NO.	TITLE	UNITS
CIS 233	Introduction to the Internet	2
CIS 234A	World Wide Web Publishing I	2
CIS 234B	World Wide Web Publishing II	2
CIS 234D	Web Authoring	2
CIS 234E	Creating an E-Commerce Web Site	2
	Total Required Units:	**10**

Data Analytics CERTIFICATE OF PROFICIENCY

The Data Analytics Certificate of Proficiency includes proficiency in MS Office applications, basic computer programming skills, database management system fundamentals, SQL, PL/SQL, Business Intelligence (BI) tools such as Tableau, general understanding of Geographical Information Systems and statistical software, R.

Career Opportunities

According to a study published by Broadening Advanced Technological Education Connections (BATECH), in 2014, there were 700,000 online job postings for occupations supporting Big Data. 130,030 of those job postings were related to data analytics and related positions. Although the majority of the job postings require a bachelor's or higher degree, massive demands exist for associate degrees or certificate holders with data analytics skills.

This program will prepare students for entry level jobs advertised as data analysts and domain analysts in various industries.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Design and write computer programs to generate descriptive statistics and explore data with graphs
- Demonstrate the ability manage unstructured and structured data and design of large scale database systems.

Degree Requirements

DEPT/NO.	TITLE	HOURS
CIS 121	Introduction to Statistical Software Programming	3
CIS 122	Data Analysis Using Statistical Software	3
CIS 123	Introduction to Big Data and Analytics	3
	Total Required Hours:	**9**

Computer Information Systems (CIS)

Computer Information Systems discipline is the integration of three dimensions: Technology, Organization, People ("TOP"). Technology (IT) dimension involves hardware, software, network, and database management. Organization dimension involves politics (power distribution), policies (codes of conduct), and procedures (process methods). People dimension involves skills, training, ergonomics (man-machine synergy), and personalities ("STEP").

CIS discipline is dedicated to students seeking to develop their technology skills.

Bureau of Labor Statistics (BLS) in 2018 reports jobs for computer and information technology will grow 13 percent from 2016 to 2026, faster than the average for all occupations. CIS jobs are projected to add about 557,100 new openings. This growth in CIS industry stems from demands for cloud computing, information security, online storage and analysis of big data.

The median annual wage for CIS occupations, which include managers, was 84.5K in May 2017, higher than the median annual wage for all occupations of 37.7K. According to Payscale.com, the average annual pay for IT Specialists, which exclude managers, is 55K within 36K to 96K range.

Students should consider what we offer – CIS degree, CIS certificate of achievement, Desktop Help Technician certificate or Web Publishing certificate of proficiency.

CIS 1
Introduction to Computer Information Systems

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Eligible for credit by examination
- Acceptable for credit: CSU, UC

General nature of computer hardware, software and systems: Hands-on applications include introduction to word processing, spreadsheet, database management and presentation software, and a brief introduction to web browsing and e-mail. 0702.00

AA/AS area 4c; CSU area E

CIS 4
Introduction to Geographical Information Systems

- 4 units, 3 hours lecture, 3 hours lab (GR)
- Acceptable for credit: CSU
- Recommended Preparation: CIS 1, CIS 5, CIS 40

Introduction to Geographic Information Systems [GIS]: Fundamental concepts, cartographic principles, hardware and software requirements; Charts, graphs, and full map layouts; Data structures and sources; Spatial databases and analysis. 0702.00

AA/AS area 4c

CIS 5
Introduction to Computer Science

- 5 units, 4 hours lecture, 3 hours laboratory (GR)
- Eligible for credit by examination
- Acceptable for credit: CSU, UC

Introduction to computer science: Architecture of digital computers, design of algorithms for solving various problems, and basic skills in computer programming. 0701.00

AA/AS area 4c

CIS 6
Introduction to Computer Programming

- 5 units, 4 hours lecture, 3 hours laboratory (GR or P/NP)
- Recommended preparation: CIS 5
- Acceptable for credit: CSU, UC

Introduction to computer programming: Algorithm design, flow charting, and debugging; elements of good programming style. Course may be instructed in any programming language. 0707.10

AA/AS area 4c

CIS 23
C# Programming

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Acceptable for credit: CSU, UC

C# programming: Basic unified modeling language (UML) notation in object-oriented software design and development using the C# programming language in a .Net environment; focus on the program structure, syntax, constructs and keywords of the C# programming language, concepts of intermediate languages (ILs), the common language runtime (CLR), and .Net standard data types. 0707.10

AA/AS area 4c

CIS 25
Object-Oriented Programming Using C++

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Recommended preparation: CIS 6 or 10 or 26
- Acceptable for credit: CSU, UC

Object-oriented methods of software development using C++: Design and implementation of objects, class construction and destruction, encapsulation, inheritance, and polymorphism. 0707.10

AA/AS area 4c

CIS 40
Database Management

- 4 units, 3 hours lecture, 3 hours laboratory (GR or P/NP)
- Recommended preparation: CIS 1 or 5
- Acceptable for credit: CSU

Design, implementation, and maintenance of databases: Analysis of user requirements; building tables, queries, forms, reports, and other topics. 0702.10

AA/AS area 4c

CIS 42
Spreadsheet Applications
- 4 units, 3 hours lecture, 3 hours laboratory (GR or P/NP)
- Recommended preparation: CIS 1 or 5 or 200
- Not open for credit to students who have completed or are currently enrolled in CIS 42A and/or 42B.
- Acceptable for credit: CSU

Principles of electronic spreadsheets using features available with current popular spreadsheet software: Worksheet creation, formatting and charting; entering data and formulas; functions; editing and printing; web queries; basic database functions of sorting and querying; creating web pages; logical functions; lookup tables; Pivot Tables, Pivot Charts, and trendlines; graphic design for financial statements; creating templates; using macros. 0702.10
AA/AS area 4c

CIS 49
Independent Study in Computer Information Systems
- .5-5 units, .5-5 hours lecture (GR or P/NP)
- Acceptable for credit: CSU

In-depth exploration of an area or problem of the student's choice not covered by regular catalog offerings in Computer information System. Student must obtain approval from an appropriate faculty member. For more details, see the section on independent study in the college catalog. 0702.00
AA/AS area 4c

CIS 70
Introduction to Tableau Analytics
- 2 units, 1.5 hours lecture, 1.5 hours laboratory (GR)
- Acceptable for credit: CSU

Introduction to Tableau desktop software application used for Big Data Analytics and Business Intelligence: various operations such as filters, calculations, creating sets, charting data, and creating visuals; usage of software to help businesses gain insight into trends in order to make informed decisions. 0702.10
AA/AS area 4c

CIS 97A
Oracle SQL and PL/SQL
- 4 units, 3 hours lecture, 3 hours laboratory (GR or P/NP)
- Prerequisite: CIS 1
- Acceptable for credit: CSU

Introduction to the design and development of multi-user relational database systems: Oracle SQL and fundamentals of PL/SQL programming. 0707.20
AA/AS area 4c

CIS 121
Introduction to Statistical Software Programming
- 3 units, 3 hours lecture (GR)

Introduction to the R programming language to perform data manipulation, statistical analysis and graphics applications: Core elements of R programming language and procedures, data management, manipulation, storage, retrieval, and graphing. Another compatible statistical software may be used. 0707.20

CIS 122
Data Analysis Using Statistical Software
- 3 units, 3 hours lecture (GR)

Recommended Preparation: MATH 013; or CIS 121
Computer application on inferential statistics: Hypothesis testing with single and paired t-tests, analysis of variance, simple and multiple linear regression, chi-square, logistics problems, queuing theory, Markov Analysis and computer simulation. 0707.20

CIS 123
Introduction to Big Data and Analytics
- 3 units, 3 hours lecture (GR)

Introduction to Big-Data, management of unstructured and structured data and design of large scale database systems: Map-reduce parallel processing algorithms, Real-time analytics and Predictive analytics, attributes of Big-Data and related issues, large scale file systems and operations. 0707.20

CIS 201
Introduction to Computer Hardware
- 4 units, 3 hours lecture, 3 hours lab (GR or P/NP)

Introduction to computer hardware: Maintaining and servicing computer equipment, fundamental concepts and architecture, major computer subsystems and peripheral devices, common computer problems, troubleshooting techniques, repair procedures and preventive maintenance; traditional, current and emerging computer technologies. 0708.20
AA/AS area 4c

CIS 205
Computer Literacy
- 1 unit, 0.75 hours lecture, 0.75 hours lab (GR or P/NP)
- Also offered as Bus 219. Not open for credit to students who have completed or are currently enrolled in Business 219.
- Eligible for credit by examination

Introduction to computers and information technology for people with no background in nor knowledge of computers. 0701.00
AA/AS area 4c

CIS 209
Introduction to Windows
- 1 unit, .75 hours lecture, .75 hours lab
- (GR or P/NP)
- Recommended preparation: CIS 205

Introduction to graphical user interfaces using Microsoft Windows. 0702.00
AA/AS area 4c

CIS 223A
Introduction to Word
- 1 unit, 0.75 hours lecture, 0.75 hours lab (GR or P/NP)

Introduction to word processing using Microsoft Word: Basic functions such as open, close, save, and print; creating and editing documents, text and print formatting techniques, spell checking, assimilating graphs and tables in documents. 0702.10
AA/AS area 4c

CIS 223B
Introduction to Excel
- 1 unit, 0.75 hours lecture, 0.75 hours lab (GR or P/NP)

Introduction to computerized spreadsheets using Microsoft Excel: Basic functions such as open, close, save and print; formulas and functions, creating charts, and formatting commands for setting up worksheets. 0702.10
AA/AS area 4c

CIS 223C
Introduction to Access
- 1 unit, 0.75 hours lecture, 0.75 hours lab (GR or P/NP)

Introduction to database management using Microsoft Access: Basic functions such as open, close, save and print; creating, maintaining, organizing, sorting, and presenting data using querying, forms and report functions. 0702.10
AA/AS area 4c

CIS 223D
Introduction to PowerPoint
- 1 unit, 0.75 hours lecture, 0.75 hours lab (GR or P/NP)

Introduction to presentation graphics software: Basic concepts such as creating on-screen slides using graphics, tables, charts, and formatted text. 0702.10
AA/AS area 4c

CIS 226A
Desktop Support Technician I
- 3 units, 2 hours lecture, 3 hours lab (GR or P/NP)

Windows Desktop applications: Configuring and troubleshooting, access to resources, hardware devices, desktop and user environments, and network services. 0708.20
AA/AS area 4c

CIS 226B
Desktop Support Technician II
- 3 units, 2 hours lecture, 3 hours laboratory (GR or P/NP)
- Recommended preparation: CIS 1

Windows desktop support: Supporting users and troubleshooting applications. 0708.20
AA/AS area 4c

CIS 227
Word Processing for Legal Professionals
- 3 units, 2 hours lecture, 3 hours laboratory (GR or P/NP)
- Recommended preparation: BUS 230DEF (Self-Paced). Students should be able to type 25 words per minute.
- Also offered as BUS 227. Not open for credit to students who have completed or are currently enrolled in BUS 227.

Emphasis on the use of Microsoft Office Word Application features to create legal-oriented documents: legal correspondence, legal pleadings, memorandum of points and authorities, table of contents, table of authorities, indexes, and forms. 0706.00
AA/AS area 4c

CIS 233
Introduction to the Internet
- 2 units, 1.5 hours lecture, 1.5 hours lab (G, P/NP)

Introduction to the Internet: Search engines, access methods, and resources. 0701.00
AA/AS area 4c

CIS 234A
World Wide Web Publishing I
- 2 units, 1.5 hours lecture, 1.5 hours laboratory
- (GR or P/NP)
- Recommended preparation: CIS 233 and GRART 112

Creating and publishing Web pages over the Internet using the Hypertext Markup Language (HTML). 0709.00
AA/AS area 4c

CIS 234B
World Wide Web Publishing II
- 2 units, 1.5 hours lecture, 1.5 hours laboratory
- (GR or P/NP)
- Prerequisite: CIS 233 and 234A
- Recommended preparation: GRART 112

Continuation of CIS 234A: Emphasis on advanced HTML and layout techniques, client-side image maps, CGI scripting, introduction to cascading style sheets and dynamic scripting. 0709.00
AA/AS area 4c

CIS 234D
Web Authoring

- 2 units, 1.5 hours lecture, 1.5 hours laboratory
- (GR or P/NP)
- Recommended preparation: CIS 234A

Art of web design and the power of web authoring in website content management and functionality: Website templates, customization, layout tables, interactive forms, frames, database interface, wizards, source controls, dynamic layers, instant updates, multimedia content, subsite and website management. 0709.00

AA/AS area 4c

CIS 234E
Creating an E-Commerce Web Site

- 2 units, 1.5 hours lecture, 1.5 hours laboratory
- (GR or P/NP)
- Recommended preparation: CIS 234A

Business strategies and programming techniques in the design and development of an electronic commerce web presence: Banner ads, auto responders, product catalogs, shopping carts, cookies, electronic payment systems, online database and website security management. 0709.00

AA/AS area 4c

CIS 238A
Word Processing I

- 3 units, 2 hours lecture, 1 hour lab (GR)

Introduction to word processing concepts and basic computer operations: Topics include: file management, creating, editing and printing documents; spell checker, thesaurus, and grammar tools; graphics; text formatting and manipulation; tables; basic desktop publishing. 0702.10

AA/AS area 4C

CIS 238B
Word Processing II

- 3 units, 2 hours lecture, 1 hour lab (GR)

Intermediate level word processing skills: Templates and styles, preparing and managing long documents, mail merge, integrating word processing applications with other applications and the World Wide Web, customizing word processing applications, creating and using forms. 0702.10

AA/AS area 4C

CIS 239
Help-Desk Tools and Techniques

- 2 units, 1.5 hours lecture, 1.5 hours laboratory
- (GR or P/NP)
- Recommended preparation: CIS 1

Help-desk tools and techniques: Troubleshooting problems on computer systems, both networked and stand-alone; customer-service skills for success; use of help-desk software. 0708.20

AA/AS area 4c