De Anza College

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Cupertino, CA 95014
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Academic Year
2011 - 2012

Computer Information Systems
Programming/Network Programming

CIS Coordinator	Business & Computer Systems Division	Counseling Center	Career Services Info.
408-864-8877	Bldg. L1 Rm. L14	Student & Community Services Bldg. 2nd Fl.	Student & Community Services Bldg. 2nd Fl.
Bldg. F5 Rm. F51i	408-864-8797	408-864-5400	408-864-5400

Please visit the Counseling Center to apply for certificates and degrees, and for academic planning assistance.

Certificate of Achievement Level Requirements
A minimum "C" grade in each major course.
Note: A maximum of six (6) quarter units may be transferred from other academic institutions.

Certificate of Achievement-Advanced Level Requirements
1. A minimum "C" grade in each major course.
2. Demonstrated proficiency in English and mathematics as evidenced by eligibility for EWRT 1A or ESL 5 and eligibility for MATH 114.
   Note: A maximum of 18 quarter units may be transferred from other academic institutions.

A.A./A.S. Degree Requirements
1. Completion of all General Education (GE) requirements (31-42 quarter units) for the A.A./A.S. degree. GE units must be completed with a minimum 2.0 GPA ("C" average).
2. Completion of all major requirements. Each major course must be completed with a minimum "C" grade.
   Major courses can also be used to satisfy GE requirements (except for Liberal Arts degrees).
   Note: A maximum of 22 quarter units from other academic institutions may be applied toward the major.
3. Completion of a minimum of 90 degree-applicable quarter units (GE and major units included). All De Anza courses must be completed with a minimum 2.0 GPA ("C" average). All De Anza courses combined with courses transferred from other academic institutions must be completed with a minimum 2.0 GPA ("C" average).
   Note: A minimum of 24 quarter units must be earned at De Anza College.

Major courses for certificates and degrees must be completed with a letter grade unless a particular course is only offered on a pass/no-pass basis.

Business Programming
Certificate of Achievement-Advanced
A.A. Degree

The Business Programming certificate and degree program creates a programming savvy entrepreneur who can make decisions about finances and technology, and who understands how to run an enterprise from both the technology and business perspectives. This program teaches skills combined from business and programming that enable a more in-depth view into the technology necessary to run a business in the 21st century.

Student Learning Outcomes - upon completion, students will be able to:
- design and develop business applications complete with user interface, algorithms and storage.
- analyze business requirements and create systems that meet the requirements.
- design and implement network topologies using knowledge about modern networks.

Certificate of Achievement-Advanced

1. Meet the requirements for this certificate level.
2. Complete the following.

ACCT 1A	Financial Accounting I	5
BUS 10	Introduction to Business	5
CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 14A	Visual Basic.NET Programming I	4.5
CIS 14B	Visual Basic.NET Programming II	4.5
CIS 64A	Database Management Systems	4.5
CIS 66	Intro. to Data Communication & Networking	5
Complete one (1) course from:		4.5
CIS 15C	Data Structures (4.5)	
CIS 63	Systems Design (4.5)	
Complete one (1) course from:*		4-5
CIS 3	Business Information Systems (4.5)	
CIS 67A	Local Area Networks (4)	
CIS 86	Computer Accounting Systems (5)	
	Total Units Required	46-47

Recommended Course Sequence:

1st Qtr	*2nd Qtr*	*3rd Qtr*	*4th Qtr*
ACCT 1A	CIS 14A	CIS 66	CIS 64
CIS 15AG	CIS 15BG	CIS 14B/15C	(*CIS 86)
(*CIS 3)	CIS 63	BUS 10	(*CIS 67A)

A.A. Degree

Meet the A.A./A.S. degree requirements.

Major	Complete the course requirements for the Business Programming Cert. of Achievement-Advanced	46-47 units
GE	General Education (31-42 units)	
Electives	Elective courses req'd. when major units plus GE units total is less than 90	
	Total Units Required	90 units

Recommended Course Sequence:

1st Qtr	*2nd Qtr*	*3rd Qtr*	*4th Qtr*	*5th Qtr*	*6th Qtr*
ACCT 1A	BUS 10	CIS 66	CIS 64	CIS 63	(*CIS 67A or CIS 3)
CIS 15AG	CIS 15BG	CIS 14A	CIS 14B/15C	(*CIS 86)	

Network Basics
Certificate of Achievement †

The Network Basics Certificate of Achievement prepares students for entry-level employment as a computer support or network technician. Students are introduced to programming, networking, and Internet protocols. This certificate program also gives students a foundation for further study in either network administration or programming.

Student Learning Outcomes - upon completion, students will be able to:
- create algorithms to solve introductory-level problems using C programming language through the stages of coding, documenting, debugging, reading and testing with various tools.
- identify networking components and protocols in the context of architectures and technologies for LAN, WAN and Internet networks.

† *Pending state approval. Please check with the department for the status.*

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 66	Intro. to Data Communication & Networking	5
CIS 67A	Local Area Networks	4
CIS 75A	Internet Concepts and TCP/IP Protocols	5
	Total Units Required	18.5

Network Programming

Certificate of Achievement-Advanced
A.A. Degree

This certificate of achievement-advanced and degree program gives students a foundation for either employment or further study in the field of network programming. The curriculum offers students an introduction to computer programming, networking, and Internet protocols. Advanced topics include data structures, advanced computer programming, Internet programming with TCP/IP, and UNIX/LINUX utilities and shell features for file manipulation and communication.

Student Learning Outcomes - upon completion, students will be able to:
- design solutions for advanced network problems creating distributed programs using Transmission Control Protocol and Internet Protocol.
- create algorithms and code, document, debug and test advanced-level C programs using multiple source and header files.
- use UNIX/LINUX utilities and shell features for file manipulation and communication.

Certificate of Achievement-Advanced

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 15C	Data Structures	4.5
CIS 18A	Introduction to UNIX/LINUX	4.5
CIS 26B	Advanced C Programming	4.5
CIS 66	Introduction to Data Communication and Networking	5
CIS 75A	Internet Concepts and TCP/IP Protocols	5
CIS 75B	Internet Programming with TCP/IP	5
Complete one (1) course from the following:		4-5
CIS 18B	Advanced UNIX/LINUX (4.5)	
CIS 21JA	Introduction to 8086 IA32 Processor Assembly Language (4.5)	
CIS 31	Operating System Concepts (5)	
CIS 33A	Programming in PERL (4.5)	
CIS 67A	Local Area Networks (4)	
CIS 67B	Introduction to Wide Area Networking (4)	
	Total Units Required	41.5-42.5

Recommended Course Sequence:

1st Qtr	*2nd Qtr*	*3rd Qtr*	*4th Qtr*
CIS 15AG	CIS 15BG	CIS 15C	CIS 75B
CIS 18A	CIS 66	CIS 26B	CIS 31 or 67A or 67B
	CIS 75A	18B or 21JA or 33A	

A.A. Degree

Meet the A.A./A.S. degree requirements.

Major	Complete the course requirements for the Network Programming Cert. of Achievement-Advanced	41.5-42.5 units
GE	General Education (31-42 units)	
Electives	Elective courses req'd. when major units plus GE units total is less than 90	
	Total Units Required	90 units

Recommended Course Sequence:

1st Qtr	*2nd Qtr*	*3rd Qtr*	*4th Qtr*	*5th Qtr*	*6th Qtr*
CIS 15AG	CIS 15BG	CIS 15C	CIS 26B	CIS 75A	(CIS 18B or 21JA or 31 or 33A or 67A
		CIS 18A	CIS 66	CIS 75B	or 67B)

Programming in C/C++

Certificate of Achievement †

The C/C++ Certificate of Achievement program prepares students for entry-level employment in computer programming, software testing and integration, software analysis or algorithm design. The curriculum offers students an introduction to programming in C, intermediate problem solving in C, and advanced C/C++ programming and design. The Certificate of Achievement program also provides a solid foundation and skill set for those interested in pursuing further study towards a Certificate of Achievement-Advanced or AA Degree in Systems Programming or Business Programming.

Student Learning Outcomes - upon completion, students will be able to:
- read, analyze and explain advanced C/C++ programs
- design solutions for advanced problems using appropriate design methodology incorporating advanced programming constructs.
- create algorithms and code, document, debug and test advanced level C/C++ programs using multiple source and header files.

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 15C	Data Structures	4.5
Complete one (1) course from:		4.5
CIS 26B	Advanced C Programming (4.5)	
CIS 27	Programming in C++ for C Programmers (4.5)	
	Total Units Required	18

Programming in JAVA

Certificate of Achievement †

This program gives students the knowledge and skills necessary to develop client/server, web and distributed environments. Organizations running networks on private and public clouds pass information among Windows NT, Macintosh, and UNIX platforms, and count on Java as a general-purpose, object-oriented solution to fulfill the development requirement of applications. The flexible nature of the language is driving the demand for trained Java programmers.

Student Learning Outcomes - upon completion, students will be able to:
- read, analyze and debug code using CoreJava
- design solutions using object-oriented programming constructs and advanced concepts in the Java Development Kit.
- design web applications using a three-tier architecture and applying advanced concepts for Java Enterprise Edition.
- design and create Java programs that can connect disparate systems using communication protocols defined in Java Enterprise Edition.
- create, design and debug advanced-level programs with Java language.

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 35A	Introduction to Java Programming	4.5
CIS 35B	Advanced Java Programming	4.5
CIS 53	Distributed Processing Using Java	4.5
	Total Units Required	22.5

† Pending state approval. Please check with the department for the status.

Programming in PERL

Certificate of Achievement †

The Programming in PERL Certificate of Achievement certifies that the student can create Perl programs. Perl is a continuously developing language, designed for practical management of important server systems. Perl programming is a key skill used in server processing, web host processing, and integrating multiple subsystems. Students develop basic knowledge of Perl which enables them to match interfaces of web protocol subsystems, the operating system, and database subsystems.

Student Learning Outcomes - upon completion, students will be able to:

- read, analyze and explain intermediate level C programs.
- design solutions for intermediate-level problems using appropriate design methodology incorporating intermediate programming constructs.
- create algorithms and code, document, debug, and test intermediate level C programs.
- use the UNIX/LINUX Operating System utilities and shell features for basic file manipulation, networking, and communication.
- design, code, document, analyze, debug, and test advanced-level Perl programs that include object-oriented Perl modules and access to database, TCP/IP, and system processes.

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 18A	Introduction to UNIX/LINUX	4.5
CIS 33A	Programming in PERL	4.5
CIS 33B	Advanced PERL Programming	4.5
	Total Units Required	22.5

Systems Programming

Certificate of Achievement-Advanced
A.A. Degree

Students pursuing the Systems Programming Certificate of Achievement-Advanced or AA degree learn computer programming fundamentals of both low-level and high-level languages and gain computing experience on both Windows and Linux platforms.

Student Learning Outcomes - upon completion, students will be able to:

- create a design, implement and debug solutions for computing systems of different levels of complexity using C and C++.
- create, design, implement, and debug solutions for embedded systems such as 8086/ IA32 processor using Assembly Language.
- use UNIX/LINUX utilities and shell features for file manipulation and communication.

Certificate of Achievement-Advanced

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 15C	Data Structures	4.5
CIS 18A	Introduction to UNIX/LINUX	4.5
CIS 21JA	Introduction to 8086 IA32 Processor Assembly Language	4.5
CIS 26B	Advanced C Programming	4.5
CIS 27	Programming in C++ for C Programmers	4.5
CIS 31	Operating System Concepts	5
Complete one (1) course from:*		4.5-5
CIS 18B	Advanced UNIX/LINUX (4.5)	
CIS 28	Object Oriented Analysis and Design (4.5)	
CIS 35A	Introduction to Java Programming (4.5)	
CIS 66	Intro. to Data Communication and Networking (5)	
	Total Units Required	41-41.5

Recommended Course Sequence:

1st Qtr	*2nd Qtr*	*3rd Qtr*	*4th Qtr*	*5th Qtr*
CIS 15AG	CIS 15BG	CIS 15C	CIS 27	(*CIS 18B or 28
CIS 18A	CIS 21JA	CIS 26B	CIS 31	or 35A or 66)

A.A. Degree

Meet the A.A./A.S. degree requirements.

Major	Complete the course requirements for the Systems Programming Cert. of Achievement-Advanced	41-41.5 units
GE	General Education (31-42 units)	
Electives	Elective courses req'd. when major units plus GE units total is less than 90	
	Total Units Required	90 units

Recommended Course Sequence:

1st Qtr	*2nd Qtr*	*3rd Qtr*	*4th Qtr*	*5th Qtr*	*6th Qtr*
CIS 15AG	CIS 15BG	CIS 15C	CIS 26B	CIS 27	(*CIS 18B or 28
CIS 18A	CIS 21JA	CIS 31			or 35A or 66)

UNIX/LINUX Operating System

Certificate of Achievement †

Students pursuing the UNIX/LINUX Operating System Certificate of Achievement learn the fundamentals of the UNIX/LINUX OS, ranging from text file manipulation, job control, and communication to implementation of shell scripts to automate tasks.

Student Learning Outcomes - upon completion, students will be able to:

- use UNIX/LINUX utilities and shell features for file manipulation, job control, and communication.
- create algorithms and code, document, debug, and test shell scripts that interact with the UNIX/LINUX Operating System.

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 15AG	Intro. to Computer Programming Using C	4.5
CIS 15BG	Intermediate Problem Solving in C	4.5
CIS 18A	Introduction to UNIX/LINUX	4.5
CIS 18B	Advanced UNIX/LINUX	4.5
CIS 18C	Shell Programming	4.5
	Total Units Required	22.5

Visual Basic Programming

Certificate of Achievement †

The Visual Basic Certificate of Achievement program prepares students for entry-level positions such as: Visual Basic Developer, .NET Developer, and Web Database Developer. Additionally, students will enhance their skills in working with spreadsheets and databases and these skills can be applied to degrees in MIS, Web Development, or any associated area.

Student Learning Outcomes - upon completion, students will be able to:

- develop and present a plan for improving a business using the business decision making model utilizing hardware and software applications such as word processing, spreadsheets, and/or databases.
- design, create and debug an application incorporating class modules, bas modules, multiple forms, and database updating.
- design, create, and debug a Web application using ASP.NET 3.5

1. Meet the requirements for this certificate level.
2. Complete the following.

CIS 3	Business Information Systems	4.5
CIS 14A	Visual Basic.NET Programming I	4.5
CIS 14B	Visual Basic.NET Programming II	4.5
CIS 86	Computer Accounting Systems	5
	Total Units Required	18.5

† *Pending state approval. Please check with the department for the status.*

Web Development

Certificate of Achievement †

The Certificate of Achievement in Web Development certifies that the student can create web pages and client side programming for web pages.

Student Learning Outcomes - upon completion, students will be able to:

- create algorithms and code, document, debug, and test introductory-level programs in a high-level programming language.
- create web pages using Extensible Hypertext Markup Language (XHTML), Cascading Style Sheets (CSS), JavaScript, and the Document Object Model (DOM), and demonstrate how they interact together within a web document.

1. Meet the requirements for this certificate level.
2. Complete the following.

Complete one (1) course from:		4.5
CIS 15AG	Intro. to Computer Programming Using C (4.5)	
CIS 14A	Visual Basic Programming I (4.5)	
Complete the following:		
CIS 18A	Introduction to UNIX/LINUX	4.5
CIS 89A	World Wide Web Page Development	3
CIS 89C	Client Side Programming with JavaScript	4.5
CIS 94	Introduction to Internet and World Wide Web *or CAOS 94*	1
CAOS 113A	Web Authoring Software (Dreamweaver) *(or both CAOS 113I, 113Q - 2 units ea.)*	4
	Total Units Required	21.5

† *Pending state approval. Please check with the department for the status.*