COMPUTER and BUSINESS INFORMATION SYSTEMS (CBIS) / COMPUTER SCIENCE (CS)

LONG BEACH CITY COLLEGE
Curriculum Guide for Academic Year 2009-2010
Associate in Arts Degree, Certificate of Achievement, and/or Certificate of Accomplishment

ALL INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE WITHOUT NOTICE

For possible updates to this guide please refer to the following website: http:// osca.lbcc.edu

CAREER OPPORTUNITIES

The CBIS Department has four Career Certificate programs and several Completion Certificate programs for students interested in working in the computer industry. Track 1 is intended for those students interested in working as help desk technicians assisting end-users resolve software and hardware problems. Track 2 is intended for students interested in developing computer application software in business and industry as an entry-level computer programmer on PCs, mid-range or larger sized computers. Track 3 is intended for students interested in a solid foundation of programming and software engineering skills for use in Computer Science. Track 4 is intended for students who want to know how networking is going to affect their work life, and want to understand what this technology is all about, or are trying to find out if a network would help their organization. It will also prepare students for MS Windows Certification. The CBIS department offers several Certificates of Accomplishment, many of which are also designed to prepare the student to pass industry certification exams.

The Certificates of Achievement will prepare students for an entry-level position in a variety of business settings:
Track 1 -   Microcomputer Help-Desk Technician: PC Support Specialist, Software Support
Track 2 -   Programmer – Java, C++, Visual BASIC, Oracle, and Desktop Support
Track 3 -   Programmer – Computer Science
Track 4 -   Networking - System Administrators or Networking Support

The Certificates of Accomplishment offered are:
1) Application Developer 2) Information Security 3) Java Web Programmer 4) Microsoft Windows Systems Administration   5) Oracle Developer Associate 6) Oracle Developer Professional 7) Oracle Database Administrator (DBA) Associate 8) Web Construction 9) Windows Network Administrator 10) Computer Tech A+ Preparation

The Associate Degree will prepare students for transfer to the four-year college or university

DEPARTMENTAL ADMISSION REQUIREMENTS
None. For more departmental information email: cbis@lbcc.edu or see cbis.lbcc.edu web site or call (562) 938-3333.

Track 1- Microcomputer Help-Desk Technician
Track 1 is intended for students interested in working as a help desk technician or in technical support of the PC systems.

REQUIRED COURSES FOR TRACK 1		UNITS	In Progress	Completed Grade
CBIS 3	Operating Systems: Software and Hardware (F, SP)	3.5		
CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
CBIS 6B	Intermediate Business Applications (F, SP, S)	3		
CBIS 6C	Advanced Business Applications (F, SP)	3		
CBIS 41	Networking Fundamentals (F, SP)	3		
CBIS 200	Computer Technician Hardware Basics (F, SP)	3.5		
CBIS 206A	Internet Basics (F, SP, S)	1		
CBIS 207AD	Web Construction I (F, SP,S)	2		
† CBIS 260	Help Desk Concepts (SP)	1		
CBIS 270	Introduction to Information Security (F, SP)	1		
Subtotal Units		**25**		

Required Work Experience in the CBIS Computer Labs - Choose a minimum of two units:

†	CBIS 71AD	Work Experience - Comp Info Sys (60 Hours) (F, SP, S)	2		
†	CBIS 72AD	Work Experience - Comp Info Sys (120 Hours) (F,SP)	3		
†	CBIS 73AD	Work Experience - Comp Info Sys (180 Hours) (F,SP)	4		
	Subtotal Units		**2-4**		

ELECTIVES Choose 5 Units from the following:

CBIS 36	Systems Analysis and Design (SP)	3		
CBIS 211AD	Web Construction II (F, SP)	2		
CBIS 251	Introduction to ASP.NET (F, SP)	3.5		
CBIS 223	Unix/Linux Fundamentals (F, SP)	3		
CAOTO 263	Customer Service (F, SP, S)	1		
CAOTO 264	Call Centers (F, SP, S)	1		
CAOTO 265	Customer Conflict Management (F, SP, S)	1		
SP 20	Elements of Interpersonal Communication (F, SP, S)	3		
Subtotal Units		**5**		

TOTAL UNITS FOR TRACK 1 — 32-34

Track 2 - Programmer

Track 2 is intended for students interested in becoming a computer programmer.

REQUIRED COURSES FOR TRACK 2		UNITS	In Progress	Completed Grade
CBIS 3	Operating Systems: Software and Hardware (F, SP)	3.5		
CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
CBIS 7	Business Programming Logic & Design (F)	3.5		
CBIS 36	Systems Analysis & Design (SP)	3		
CBIS 38	Database Concepts (F)	4		
CBIS 223	Unix/Linux Fundamentals (F, SP)	3		
Subtotal Units		**21**		

Choose one series of the following:

CBIS 8B **and**	Visual BASIC Programming (F, SP)	4		
CBIS 208B	Advanced Visual Basic Programming (F, SP)	4		
or	**Or**	**or**		
CS 11 **and**	Computer Programming/C++ I (F)	3.5		
† CS 12	Computer Programming/C++ II (SP)	3.5		
or	**Or**	**or**		
CBIS 14 **and**	Introduction to Java Programming (F, SP)	3.5		
CBIS 8B	Visual BASIC Programming (F, SP)	4		
or	**Or**	**or**		
CBIS 242AD **and**	Introduction to Oracle: SQL (F, SP)	3		
CBIS 243AD **and**	Program with Oracle PL/SQL (F, SP)	2.5		
CBIS 246AD	Oracle DBA Fundamentals (SP)	2.5		
Subtotal Units		**7-8**		

Choose one of the following alternative languages:

CBIS 8B	Visual BASIC Programming (F, SP)	4		
CS 11	Computer Programming/C++ I (F)	3.5		
CBIS 14	Introduction to Java Programming (F, SP)	3.5		
CBIS 216A	Introduction to C# Programming (F)	3.5		
CBIS 245	ST Database and Business Intelligence	2.5		
CBIS 420	PHP & My SQL for the Web (F, SP)	3.5		
CBIS 430	Ruby on Rails Web Development (F, SP)	3.5		
CBIS 492	ST Interpretive Programming languages (F)	2.5		
Subtotal Units		**2.5-4**		

ELECTIVES: Choose 4 units from classes below or from the alternate languages above

			UNITS	In Progress	Completed Grade
†	CBIS 71AD	Work Experience - Comp Info Sys (60 Hours) (F, SP, S)	2		
†	CBIS 72AD	Work Experience - Comp Info Sys (120 Hours) (F,SP)	3		
†	CBIS 73AD	Work Experience - Comp Info Sys (180 Hours) (F,SP)	4		
	CBIS 251	Introduction to ASP.NET (F, SP)	3.5		
	CBIS 207E	Dynamic HTML Web Construction (SP)	2.5		
	CBIS 206C	World Wide Web Database Programming (SP)	2.5		
	CBIS 436A	Intro to Project Management Systems (SP)	3		
Subtotal Units			**4**		
TOTAL UNITS FOR TRACK 2			**34.5 – 37**		

<u>**Track 3 - Programmer – Computer Science**</u>

Track 3 is intended for students interested in Computer Science courses that will help them succeed after transferring to a CSU or UC School Computer Science major program. You must see a counselor specific computer science transfer requirements to a CSU or UC school. Not all of the courses in this track will meet the specific degree requirements of a particular school.

REQUIRED COURSES FOR TRACK 3			UNITS	In Progress	Completed Grade
	CBIS 3	Operating Systems: Software and Hardware (F, SP)	3.5		
	CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
	CBIS 7	Business Programming Logic & Design (F, SP)	3.5		
†	CBIS 36	Systems Analysis & Design (SP)	3		
	CBIS 38	Database Concepts (F)	4		
	CBIS 223	Unix/Linux Fundamentals (F, SP)	3		
Subtotal Units			**21**		

Choose one series of the following:

	CBIS 8B **and**	Visual BASIC Programming (F, SP)	4		
	CBIS 208B	Advanced Visual Basic Programming (F, SP)	4		
	or	**or**	**Or**		
	CS 11 **and**	Computer Programming/C++ I (F)	3.5		
†	CS 12 **and**	Computer Programming/C++ II (SP)	3.5		
	CS 13	C++ Data Structures and Algorithms	3.5		
	or	**or**	**Or**		
	CS 21 and	Introduction to Computer Science I (F)	3.5		
†	CS 22 **and**	Introduction to Computer Science II (SP)	3.5		
†	CS 23	Fundamental Data Structures (F)	3.5		
Subtotal Units			**8-10.5**		

Choose one of the following alternative languages:

	CBIS 8B	Visual BASIC Programming (F, SP)	4		
	CS 11	Computer Programming/C++ I (F)	3.5		
	CS 21	Introduction to Computer Science I (F)	3.5		
	CBIS 216A	Introduction to C# Programming (F)	3.5		
	CBIS 420	PHP & My SQL for the Web (F, SP)	3.5		
	CBIS 492	ST Interpretive Programming languages (F)	2.5		
Subtotal Units			**2.5-4**		

ELECTIVES: Choose 5 units from classes below

†¶	MATH 60	First Calculus Course	5		
†	MATH 70	Second Calculus Course	5		
†	MATH 80	Third Calculus Course	5		
†	MATH 55A	Discrete Mathematics I	4		
†	MATH 55B	Discrete Mathematics II	3		

Electives continued below

			UNITS		
†	PHYS 3A	Physics in Science and Engineering - Mechanics	5		
†	PHYS 3B	Physics in Science and Engineering - E and M	4		
†	PHYS 3C	Physics in Science and Engineering – Modern Physics	4		
	CS 51	Introduction to Computer Architecture	3.5		
†	CS 52	Introduction to Software Engineering	3.5		
Subtotal Units			**5**		
TOTAL UNITS FOR TRACK 3			**36.5 – 40.5**		

Track 4 - Networking

This area of concentration is to prepare students for a job as a network professional and for students who want to know how networking is going to affect their work life, and want to understand what this technology is all about, or are trying to find out if a network would help their organization. It will also prepare students for CompTIA, Network+, and MS Windows Certification.

REQUIRED COURSES FOR TRACK 4		UNITS	In Progress	Completed Grade
CBIS 3	Operating Systems: Software and Hardware (F, SP)	3.5		
CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
CBIS 41	Networking Fundamentals (F, SP)	3		
CBIS 200	Computer Technician Hardware Basics (F, SP)	3.5		
CBIS 212	Wireless Communications (F, SP)	1.5		
CBIS 220	i-Net+ Internet Technologies (F, SP)	3		
CBIS 223	Unix/Linux Fundamentals (F, SP)	3		
CBIS 225	Microsoft Windows Client O.S. (F)	2.5		
CBIS 226	Microsoft Windows Server O.S. (F)	2.5		
CBIS 227	Microsoft Windows Networking (SP)	2.5		
Subtotal Units		**29**		

ELECTIVES: Choose 4 units from below

			UNITS		
†	CBIS 71AD	Work Experience - Comp Info Sys(60 Hours)(F, SP, S)	2		
†	CBIS 72AD	Work Experience - Comp Info Sys(120 Hours)(F, SP)	3		
†	CBIS 73AD	Work Experience - Comp Info Sys (180 Hours)(F, SP)	4		
	CBIS 228	Microsoft Windows Directory Services	2.5		
	CBIS 229	Microsoft ISA Server (SP)	2.5		
	CBIS 270	Introduction to Information Security (F, SP)	1		
	CBIS 271	Network Security Fundamentals (F, SP)	3		
	CISCO 250	Communications Cabling Installation	3		
	CISCO 251	Introduction to Networking	3		
†	CISCO 252	Routing and Access Control	3		
†	CISCO 253	Cisco Networking III, LAN	3		
†	CISCO 254	WAN's and Remote Access	3		
TOTAL UNITS FOR TRACK 4			**33**		

LEGEND
† **This course has a prerequisite; prerequisite courses must be completed with at least a "C" or "P" grade (see catalog or schedule of classes).**
(SP = Spring) (S = Summer) (F = Fall) (INF = Infrequently) = Represents general frequency of course offering

For **CERTIFICATE OF ACHIEVEMENT:**
This certificate is a one- to two-year program to develop skills for employment. Complete the required units with a minimum grade of "C" in each course. At least 50 percent of the unit requirements for the Certificate of Achievement must be completed at Long Beach City College (credit earned by exam, where applicable, may be included). Please submit completed certificate applications to the Admissions and Records office during the final semester of course work.

For **ASSOCIATE DEGREE:**
The Associate degree is a two-year college degree awarded by Long Beach City College that includes general education courses and a field of concentration (major). In addition to the Certificate of Achievement requirements, complete the Associate degree requirements specified in the catalog. You must use the requirements for general education/proficiency and the career certificate from the same catalog year. This catalog year may be any year between the year of initial enrollment to the present, provided continuous enrollment is maintained throughout (see the catalog for definition of "continuous enrollment"). At least 50 percent of the unit requirements for this field of concentration must be completed at Long Beach City College (credit earned by exam, where applicable, may be included).

In general, "double-counting" is not allowed. That is, one course may not be used to fulfill both a field of concentration requirement and a general education requirement.

SUGGESTED SEQUENCE OF COURSES
This is not an educational plan, as course offerings, student schedules, and circumstances vary. Students must meet all the prerequisites in order to be eligible for the sequence of courses.

A suggested sample sequence of courses for the required units

	TRACK 1		TRACK 2		TRACK 3		TRACK 4	
1st Sem.	CBIS 6A CBIS 206A CBIS 3	4 1 3.5	CBIS 3 CBIS 6A CBIS 7	3.5 4 3.5	CBIS 3A CBIS 6A CBIS 7	1 4 3.5	CBIS 3A CBIS 6A CBIS 220	1 4 3

2nd Sem.	CBIS 6B
	CBIS 200
	CBIS 270
	CBIS 71,72,73*
		3
		3.5
		1
			CBIS 8B or
			  CS 11 or
			  CBIS 14 or
			  CBIS 242AD
			CBIS 223
			CBIS 38
			CBIS 71,72,73*
				4
				3.5
				3.5
				3
				3
				4
				2
					CBIS 8B or
					  CS 11 or
					  CS 21
					CBIS 223
					CBIS 38
					CBIS 71, 72, 73*
						4
						3.5
						3.5
						3
						4
							CBIS 200
							CBIS 41
							CBIS 223
								3.5
								3
								3

3rd Sem.	CBIS 6C
	CBIS 41
	CBIS 71,72,73*
	Elective
		3
		3
		2
			CBIS 208B or
			  CS 12 or
			  CBIS 8B or
			  CBIS 243AD
			CBIS 36
			CBIS 71,72,73*
			Elective
				4
				3.5
				4
				2.5
				3
					CBIS 208B or
					  CS 12 or
					  CS 22
					CBIS 36
					CBIS 71,72,73*
					Elective
						4
						3.5
						3.5
						3
							CBIS 225+226
							CBIS 71,72,73*
							Elective
								5
								2

4th Sem.	CBIS 260
	CBIS 36
	CBIS 207AD
	CBIS 71,72,73*
	Elective
		1
		3
		2
		2
			CBIS 8B or
			  CS 11 or CBIS 14
			  Or 216A or 492
			CBIS 246AD
			CBIS 71,72,73*
			Elective
				4
				3.5
				2.5
				2.5
				2
					CBIS 8B or
					  CS 11 or CBIS
					  14 Or 216A or
					  492
					CS 21
					CS 23
					CBIS 71,72,73*
					Elective
						4
						3.5
						3.5
						2.5
						3
							CBIS 212
							CBIS 227
							CBIS 71,72,73*
							Elective
								1.5
								2.5
								2

*NOTE: CBIS 71, 72, or 73 may be taken during the 2nd, 3rd, or 4th semesters.

CERTIFICATES OF ACCOMPLISHMENT

FOR OFFICE USE ONLY: 4126	*Name of Certificate:* *Computer Tech A+ Preparation*

REQUIRED COURSES			UNITS	In Progress	Completed Grade
	CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
	CBIS 3	Operating Systems: Software and Hardware (F, SP)	3.5		
	CBIS 200	Computer Technician Hardware Basics (F, SP)	3.5		
†	CBIS 71AD, 72AD, or 73AD	Work Experience (F, SP, S)	2-4		
TOTAL UNITS			**13 –15**		

NOTE: A letter grade of "C" or better must be earned in each course, and a cumulative GPA of at least 3.0 must be maintained. All courses must be completed within a 5 year span.

FOR OFFICE USE ONLY: 4087	*Name of Certificate:* *APPLICATION DEVELOPER*

REQUIRED COURSES			UNITS	In Progress	Completed Grade
	CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
†	CBIS 7	Business Programming Logic & Design (F, SP)	3.5		
	CBIS 6B	Intermediate Business Applications (F, SP, S)	3		
	CBIS 6C	Advanced Business Applications (F, SP)	3		
	CBIS 8B	Visual Basic Programming (F, SP)	4		
†	CBIS 71AD	Work Experience (F, SP, S)	2		
TOTAL UNITS			**19.5**		

FOR OFFICE USE ONLY: 4106	*Name of Certificate: INFORMATION SECURITY*

REQUIRED COURSES			UNITS	In Progress	Completed Grade
	CBIS 41	Networking Fundamentals (F, SP)	3		
	CBIS 220	i-Net+ Internet Technologies (F, SP)	3		
	CBIS 270	Introduction to Information Security (F, SP)	1		
	CBIS 271	Network Security Fundamentals (F, SP)	3		
TOTAL UNITS			**10**		

Recommended not required course(s)

	CBIS 223	Unix/Linux Fundamentals (F, SP)	3.0		
	CBIS 225	MS Windows Client OS (F)	2.5		
	CBIS 226	MS Windows Server OS (F)	2.5		
	CBIS 227	MS Windows Networking (SP)	2.5		
	CBIS 235A	Linux Server Administration (SP)	3.5		
	CBIS 235B	Linux Networking & Security (SP)	3.5		

FOR OFFICE USE ONLY: 4083	*Name of Certificate: JAVA WEB* *PROGRAMMER*

REQUIRED COURSES			UNITS	In Progress	Completed Grade
†	CBIS 7	Business Programming Logic & Design (F)	3.5		
	CBIS 14	Introduction to Java Programming (F, SP)	3.5		
	CBIS 38	Database Concepts (F)	4		
	CBIS 220	i-Net+ Internet Technologies (F, SP)	3		
	CBIS 207AD	Web Construction I (F, SP, S)	2		
TOTAL UNITS			**16**		

FOR OFFICE USE ONLY: 4107	*Name of Certificate:* *Microsoft Windows Systems Administration*

REQUIRED COURSES		UNITS	In Progress	Completed Grade
CBIS 225	Microsoft Windows Client OS (F)	2.5		
CBIS 226	Microsoft Windows Server OS (F)	2.5		
CBIS 227	Microsoft Windows Networking (SP)	2.5		
CBIS 228	Microsoft Windows Directory Services (SP)	2.5		
CBIS 229	Microsoft ISA Server (SP)	2.5		
TOTAL UNITS		**12.5**		

FOR OFFICE USE ONLY: 4097	*Name of Certificate:* *ORACLE DEVELOPER ASSOCIATE*

REQUIRED COURSES		UNITS	In Progress	Completed Grade
CBIS 38	Database Concepts (F)	4		
CBIS 242AD	Introduction to Oracle: SQL (F, SP)	3		
CBIS 243AD	Program with Oracle PL/SQL (F, SP)	2.5		
TOTAL UNITS		**9.5**		

FOR OFFICE USE ONLY: 4099	*Name of Certificate:* *ORACLE DEVELOPER PROFESSIONAL*

REQUIRED COURSES		UNITS	In Progress	Completed Grade
CBIS 36	System Design and Analysis (SP)	3		
CBIS 38	Database Concepts (F)	4		
CBIS 242AD	Introduction to Oracle: SQL (F, SP)	3		
CBIS 243AD	Program with Oracle PL/SQL (F, SP)	2.5		
CBIS 244	Oracle Forms: Build Internet Apps I (F)	2.5		
TOTAL UNITS		**15**		

FOR OFFICE USE ONLY: 4098	*Name of Certificate:* *ORACLE DATABASE ADMINISTRATOR (DBA) ASSOCIATE*

REQUIRED COURSES		UNITS	In Progress	Completed Grade
CBIS 38	Database Concepts (F)	4		
CBIS 242AD	Introduction to Oracle: SQL (F, SP)	3		
CBIS 246AD	Oracle DBA Fundamentals (SP)	2.5		
TOTAL UNITS		**9.5**		

Name of Certificate: WEB CONSTRUCTION

REQUIRED COURSES		UNITS	In Progress	Completed Grade
CBIS 207AD	Web Construction I (F, SP, S)	2		
CBIS 220	i-Net+ Internet Technologies (F, SP)	3		
CBIS 207E	Dynamic HTML Web Construction (SP)	2.5		
CBIS 206C	World Wide Web Database Programming (SP)	2.5		
CBIS 211AD	Web Construction II (F, SP)	2		
TOTAL UNITS		**12**		

Recommended not required course(s)

CBIS 6A	Intro to IT Concepts & Applications (F, SP, S)	4		
CBIS 41	Networking Fundamentals (F, SP)	3		

Name of Certificate: WINDOWS NETWORK ADMINISTRATOR

REQUIRED COURSES		UNITS	In Progress	Completed Grade
CBIS 3	Operating Systems: Software and Hardware (F, SP)	3.5		
CBIS 41	Networking Fundamentals (F, SP)	3		
CBIS 212	Wireless Communications (F, SP)	1.5		
CBIS 225	Microsoft Windows Client OS (F)	2.5		
CBIS 226	Microsoft Windows Server OS (F)	2.5		
CBIS 227	Microsoft Windows Networking (SP)	2.5		
TOTAL UNITS		**15.5**		

LEGEND

† **This course has a prerequisite; prerequisite courses must be completed with at least a "C" or "P" grade (see catalog or schedule of classes**

(SP = Spring) (S = Summer) (F = Fall) (INF = Infrequently) = Represents general frequency of course offering

CERTIFICATE OF ACCOMPLISHMENT REQUIREMENTS

For **CERTIFICATE OF ACCOMPLISHMENT**: This certificate certifies a competency in a given area and requires less than 18 units. Complete the required units with a minimum grade of "C" in each class. Fifty percent (50%) or more of the unit requirements for this field of concentration must be completed in residence. Please submit completed certificate applications to the Admissions and Records office during the final semester of course work

Students interested in transferring to a university to continue their study in this field of concentration or other majors are strongly advised to consult an LBCC academic counselor and refer to the ASSIST website (www.assist.org) for major preparation information. Counselors can clarify the different major and admissions requirements at a university. Students may visit the Student Success/Transfer Services Center to access further educational resources. If you need to set up an appointment to see a counselor or schedule the SOAR Test, call LAC (562) 938-4561 or PCC (562) 938-3920.