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

Curriculum Guide for Academic Year 2011-2012

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Students planning to **transfer** to a four-year college or university should refer to the ASSIST web site at www.assist.org and **consult a counselor** before beginning a program of study. To meet with a counselor call 562-938-4561 for the LAC, or (562) 938-3920 for PCC. Students may also wish to visit the Transfer Center on either campus.

Program of study leading to:
Associate in Arts (A.A.) Degree

Track 1: Microcomputer Help-Desk Technician: 1123 *This track is intended for students interested in working as a help desk technician or in technical support of the PC systems.*

Required CORE courses (listed below in recommended sequence)		UNITS	In Progress	Completed Grade
† CBIS 6A	Intro to IT Concepts & Applications	4		
CAOTO 15	Business Communications	3		
CBIS 41	Networking Fundamentals	3		
† CBIS 36	Systems Analysis and Design	3		
Subtotal Units		**13**		

Required MAJOR COURSES (listed below in recommended sequence)		UNITS	In Progress	Completed Grade
† CBIS 207AD	Web Construction I	2		
CBIS 270	Introduction to Information Security	1		
† CBIS 3	Operating Systems: Software and Hardware	3.5		
† CBIS 200	Computer Technician Hardware Basics	3.5		
† CBIS 260	Help Desk Concepts	1		
Subtotal Units		**11**		

Associate Degree requirements continue on the following page:
Associate Degree requirements continued from the previous page:

Track 1 continued:

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Track 1 AA = 1123; C-ACH = 3123   Track 2 AA = 1124; C-ACH = 3124   Published: June 2011
Track 3 AA = 1119; C-ACH = 3119   Track 4 AA = 1125; C-ACH = 3125
Departmental Phone: 562-938-4333, Web site: http://cbis/lbcc.edu , Email: cbis@lbcc.edu
Information on this sheet is subject to change without notice. Any updates to this guide are posted at http://osca.lbcc.edu .

IN ADDITION
Required Work Experience—complete at least TWO (2) units from the following:

	Course	Title	UNITS		
†	CBIS 71AD	Work Experience—Comp Info Sys (60 hours)	2		
†	CBIS 72AD	Work Experience—Comp Info Sys (120 hours)	3		
†	CBIS 73AD	Work Experience—Comp Info Sys (180 hours)	4		
		Subtotal Units	**2-4**		

IN ADDITION, complete THREE (3) UNITS from the following courses:

	Course	Title	UNITS		
†	CAOTC 39A	Microsoft Word for Windows	3		
†	CBIS 211AD	Web Construction II	2		
†	CBIS 223	Unix/Linux Fundamentals	3		
℮	CAOTO 263	Customer Service	3(3.5)		
†	CBIS 6B	Intermediate Business Applications	3		
†	CBIS 6C	Advanced Business Applications	3		
		Subtotal Units	**3**		
		TRACK 1 TOTAL UNITS	**29(29.5)-31(31.5)**		

Track 2: Programmer: 1124 *.This track is intended for students interested in becoming a computer programmer.*

	Course	**Required CORE courses (listed below in recommended sequence)**	UNITS	In Progress	Completed Grade
†	CBIS 6A	Intro to IT Concepts & Applications	4		
	CAOTO 15	Business Communications	3		
	CBIS 41	Networking Fundamentals	3		
†	CBIS 36	Systems Analysis and Design	3		
		Subtotal Units	**13**		

	Course	**REQUIRED MAJOR COURSES (listed below in recommended sequence)**	UNITS	In Progress	Completed Grade
†	CBIS 3	Operating Systems: Software and Hardware	3.5		
†	CBIS 7	Business Programming Logic & Design	3.5		
†	CBIS 38	Database Concepts	4		
		Subtotal Units	**11**		

IN ADDITION, complete ONE (1) of the following SERIES:

	Course	Title	UNITS		
††	CBIS 8B **AND**	Visual BASIC Programming **AND**	4 **AND**		
	CBIS 208B	Advanced Visual Basic Programming	4		
	OR				
††	CS 11 **AND**	Computer Programming/C++ I **AND**	3.5 **AND**		
	CS 12	Computer Programming/C++ II	3.5		
	OR				
†	CS 21 **AND**	Introduction to Computer Science (java) **AND**	3.5 **AND**		
†	CBIS 8B	Visual BASIC Programming	4		
		Subtotal Units	**7-8**		

IN ADDITION, complete ONE (1) of the following ELECTIVES:

	Course	Title	UNITS		
†	CBIS 8B	Visual BASIC Programming	4		
†	CS 11	Computer Programming/C++ I	3.5		
†	CS 21	Introduction to Computer Science I	3.5		
†	CBIS 71AD	Work Experience - Comp Info Sys (60 Hours)	2		
†	CBIS 72AD	Work Experience - Comp Info Sys (120 Hours)	3		
†	CBIS 73AD	Work Experience - Comp Info Sys (180 Hours)	4		
†	CBIS 206C	World Wide Web Database Programming (SP)	2.5		
†	CBIS 207E	Dynamic HTML Web Construction	2.5		
†	CBIS 216A	Introduction to C# Programming	3.5		
†	CBIS 223	Unix/Linux Fundamentals	3(3.5)		
†	CBIS 436A	Intro to Project Management Systems (SP)	3		
†	CBIS 251	Introduction to ASP.NET	3.5		

†	CBIS 420	PHP & My SQL for the Web	3.5		
†	CBIS 430	Ruby on Rails Web Development	3.5		
†	CBIS 492	ST Interpretive Programming Languages	2.5		
		Subtotal Units	**2.5 - 4**		
		TRACK 2 TOTAL UNITS:	**33.5-36**		

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*Track 3: Programmer—Computer Science: 1119 .*This track 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. See a counselor to inquire about CSU or UC school-specific computer science transfer requirements. Not all the courses in this track will meet the specific degree requirements for a particular school.

	Required CORE courses (listed below in recommended sequence)		**UNITS**	**In Progress**	**Completed Grade**
†	CBIS 6A	Intro to IT Concepts & Applications	4		
	CAOTO 15	Business Communications	3		
	CBIS 41	Networking Fundamentals	3		
†	CBIS 36	Systems Analysis and Design	3		
		Subtotal Units	**13**		

	REQUIRED MAJOR COURSES (listed below in recommended sequence)		**UNITS**	**In Progress**	**Completed Grade**
†	CBIS 3	Operating Systems: Software and Hardware	3.5		
†	CBIS 7	Business Programming Logic & Design	3.5		
†	CBIS 38	Database Concepts	4		
†	CBIS 223	Unix/Linux Fundamentals	3(3.5)		
		Subtotal Units	**14(14.5)**		

	IN ADDITION, complete ONE (1) of the following SERIES:		**UNITS**		
†	CBIS 8B **AND**	Visual BASIC Programming **AND**	4 **AND**		
†	CBIS 208B	Advanced Visual Basic Programming	4		
	OR				
†††	CS 11 **AND**	Computer Programming/C++ I **AND**	3.5 **AND**		
	CS 12 **AND**	Computer Programming/C++ II **AND**	3.5 **AND**		
	CS 13	C++ Data Structures and Algorithms	3.5		
	OR				
††	CS 21 **AND**	Introduction to Computer Science I**AND**	3.5 **AND**		
	CS 22 **AND**	Introduction to Computer Science II **AND**	3.5 **AND**		
		Subtotal Units	**7 – 10.5**		

	IN ADDITION, complete ONE (1) of the following ELECTIVES:		**UNITS**		
†	CBIS 8B	Visual BASIC Programming	4		
†	CS 11	Computer Programming/C++ I	3.5		
†	CS 21	Introduction to Computer Science	3.5		
†	CBIS 216A	Introduction to C# Programming	3.5		
†	CBIS 420	PHP & My SQL for the Web	3.5		
†	CBIS 430	Ruby on Rails Web Development	3.5		
†	CBIS 492	ST Interpretive Programming Languages	2.5		
		Subtotal Units	**2.5 - 4**		

	IN ADDITION, complete FIVE (5) UNITS from the following:		**UNITS**		
†	MATH 60	First Calculus Course	5		
†	MATH 70	Second Calculus Course	5		
†	MATH 80	Third Calculus Course	5		

			UNITS	In Progress	Completed Grade
†	MATH 55A	Discrete Mathematics I	4		
†	MATH 55B	Discrete Mathematics II	3		
†	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		
		Subtotal Units	**5**		
		TRACK 3 TOTAL UNITS:	**41.5-46.5**		

Track 4: Networking: `1125` *This track is intended for students interested in working as a help desk technician or in technical support of the PC systems.*

	Required CORE courses (listed below in recommended sequence)		**UNITS**	**In Progress**	**Completed Grade**
†	CBIS 6A	Intro to IT Concepts & Applications	4		
	CAOTO 15	Business Communications	3		
	CBIS 41	Networking Fundamentals	3		
†	CBIS 36	Systems Analysis and Design	3		
		Subtotal Units	**13**		

	REQUIRED COURSES (listed below in recommended sequence)		**UNITS**	**In Progress**	**Completed Grade**
†	CBIS 3	Operating Systems: Software and Hardware	3.5		
†	CBIS 200	Computer Technician Hardware Basics	3.5		
†	CBIS 212	Wireless Communications	1.5		
†	CBIS 220	i-Net+ Internet Technologies	3		
†	CBIS 223	Unix/Linux Fundamentals	3(3.5)		
†	CBIS 225	Microsoft Windows Client O.S.	2.5		
†	CBIS 226	Microsoft Windows Server O.S.	2.5		
†	CBIS 227	Microsoft Windows Networking	2.5		
		Subtotal Units	**22(22.5)**		

	Recommended but not required Electives:		**UNITS**		
†	CBIS 71AD	Work Experience—Comp Info Sys (60 hours)	2		
†	CBIS 72AD	Work Experience—Comp Info Sys (120 hours)	3		
†	CBIS 73AD	Work Experience—Comp Info Sys (180 hours)	4		
†	CBIS 228	Microsoft Windows Directory Services	2.5		
	CBIS 270	Introduction to Information Security	1		
†	CBIS 271	Network Security Fundamentals	3		
	CISCO 250	Networking Wiring 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		
		Subtotal Units	**0**		
		TRACK 4 TOTAL UNITS	**35(35.5)**		

For graduation with an **Associate in Arts (A.A.) Degree with a major in CBIS/CS:**
1. **Units**: Complete a minimum of 60 units, distributed as follows:

Track 1: Microcomputer Help-Desk Technician Major: 29(29.5)-31(31.5) units

         General Education/A.A.   25 units

         Electives/Other courses: 4-6 units

         TOTAL: 60 units

     Track 2: Programmer   **Major:**   33.5-36 units

         General Education/A.A.   25 units

	Electrodes/Other courses:	0 – 1.5 units
	TOTAL:	60 units
Track 3: **Programmer-Computer Science**	**Major:**	41.5 – 46.5
	General Education/A.A.	25 units
	Electives/Other courses:	0 units
	TOTAL:	66.5 – 71.5 units
Track 4: **Networking**	**Major:**	35(35.5) units
	General Education/A.A.	25(24.5) units
	Electives/Other courses:	0 units
	TOTAL:	60 units

1. **Scholarship:** Maintain an **overall grade point average (GPA) of 2.0** ("C" average) based on all accredited college work applied to the degree, no matter where completed. For this **field of concentration, complete each course above** with a **grade of "C" or better**, or "P" if course is graded on a P/NP basis.
2. **Residence for the Degree:** Complete at least 30 units of the required 60 in residence at LBCC, or complete in residence at LBCC at least 20 units within the last 30 units of work applied to the degree.
3. **Residence for the Field of Concentration**: Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means:
   For **Track 1**, complete **at least 15-16 units** of the required 29(29.5) – 31(31.5) **at Long Beach City College**.
   For **Track 2**, complete **at least 17-18 units** of the required 33.5-36 **at Long Beach City College**.
   For **Track 3**, complete **at least 21- 24 units** of the required 41.5 - 46.5 **at Long Beach City College**.
   For **Track 4**, complete **at least 18 units** of the required 35 **at Long Beach City College**.
   Credit earned by exam, where applicable, may be included.
4. **General Education and Proficiency Requirements:** Complete the required A.A./A.S. General Education and Proficiency requirements*, otherwise known as "Plan A". For Plan A requirements, refer to the general catalog or view it online at http://osca.lbcc.edu .
5. Complete and submit the degree application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at http://admissions.lbcc.edu/ . Refer to the Schedule of Classes (http://schedule.lbcc.edu) and click the "Important Dates" link to view the actual deadline for each semester.

*The requirements for general education/proficiency and the field of concentration (major) need to be 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".

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

Program of study leading to:
Certificate of Achievement

REQUIRED COURSES—Complete the required courses for the specific Track as listed in the Associate Degree requirements box on the preceding pages.

Track 1 REQUIRED COURSES		In Progress	Completed
	TOTAL UNITS TRACK 1 29(29.5) – 31(31.5)		

Track 2 REQUIRED COURSES	In Progress	Completed

	TOTAL UNITS TRACK 2	33.5 - 36		

			In Progress	**Completed**
Track 3 REQUIRED COURSES				
	TOTAL UNITS TRACK 3	41.5 - 46.5		

			In Progress	**Completed**
Track 4 REQUIRED COURSES				
	TOTAL UNITS TRACK 4	35(35.5)		

For graduation with a **CBIS/CS Certificate of Achievement:**

1. Complete each of the **REQUIRED COURSES** listed above with a **minimum grade of** "**C**".
2. Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence. Credit earned by exam, where applicable, may be included.
   For **Track 1**, complete **at least 15-16 units** of the required 29(29.5) – 31(31.5) **at Long Beach City College**.
   For **Track 2**, complete **at least 17-18 units** of the required 33.5-36 **at Long Beach City College**.
   For **Track 3**, complete **at least 21- 24 units** of the required 41.5 - 46.5 **at Long Beach City College**.
   For **Track 4**, complete **at least 18 units** of the required 35(35.5) **at Long Beach City College**.
3. Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at http://admissions.lbcc.edu/ . Refer to the Schedule of Classes (http://schedule.lbcc.edu) and click the "Important Dates" link to view the actual deadline for each semester.

Suggested Sequence of Classes

This is not an educational plan, as course offerings, student schedules, and circumstances vary. Students should follow the requisite skills sequence as indicated by arrows

	Semester 1	Semester 2	Semester 3	Semester 4

Track 1: Help Desk

Semester 1: CBIS 6A, CAOTO 15, CBIS 270
Semester 2: CBIS 200, CBIS 3, CBIS 207AD
Semester 3: CBIS 41, CBIS Elective, CBIS 71A / CBIS 72A / CBIS 73A
Semester 4: CBIS 36, CBIS 260, CBIS Elective

Track 2: Programmer

Semester 1: CBIS 6A, CAOTO 15
Semester 2: CBIS 3, CBIS 7, CBIS 38
Semester 3: CBIS 41, Trig, CS 21, CBIS 8B, Algebra, CS 11
Semester 4: CBIS 36, Elective, CS 22, CBIS 208B, CS 12

Track 3: Computer Science Transfer

Semester 1: CBIS 6A, CAOTO 15
Semester 2: CBIS 3, CBIS 7, CBIS 38
Semester 3: CBIS 41, Trig, CS 21, CBIS 8B, Algebra, CS 11, CBIS 223
Semester 4: CBIS 36, CBIS Elective, CS 22, CBIS 208B, CS 12 → CS 13, MATH PHYS Elective

Track 4: Networking

Semester 1: CBIS 6A, CAOTO 15
Semester 2: CBIS 220, CBIS 200, CBIS 3, CBIS 41
Semester 3: CBIS 223, CBIS 225 / CBIS 226
Semester 4: CBIS 36, CBIS 212, CBIS Elective, CBIS 227

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Program of study leading to:
Certificates of Accomplishment

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Certificate: Computer Tech A+ Preparation `4126`

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

For the above certificate only, a grade of "C" or better is required in each course, and cumulative GPA of at least 3.0 must be maintained. All courses must be completed within 5 years.

Certificate: Application Developer `4087`

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

This one is under review by R. Powell as of Sept. 2010 due to units being over the max (must be under 18).

Certificate: Information Security `4106`

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

RECOMMENDED, but not required courses			UNITS		
	CBIS 223	Unix/Linux Fundamentals	3(3.5)		
	CBIS 225	MS Windows Client OS	2.5		
†	CBIS 226	MS Windows Server OS	2.5		
†	CBIS 227	MS Windows Networking	2.5		
†	CBIS 235A	Linux Server Administration	3.5		
†	CBIS 235B	Linux Networking & Security	3.5		

Certificates of Accomplishment continue on the following page:
Certificates of Accomplishment continued from the previous page:

Track 1 AA = 1123; C-ACH = 3123   Track 2 AA = 1124; C-ACH = 3124
Track 3 AA = 1119; C-ACH = 3119   Track 4 AA = 1125; C-ACH = 3125
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Certificate: *Java Web Programmer* 4083

REQUIRED COURSES		UNITS	In Progress	Completed Grade
† CBIS 7	Business Programming Logic & Design	3.5		
† CS 21	Introduction to Computer Science I (java)	3.5		
† CBIS 38	Database Concepts	4		
† CBIS 220	i-Net+ Internet Technologies	3		
† CBIS 207E	Dynamic HTML Web Construction	2.5		
	TOTAL UNITS	**16.5**		

Certificate: *Microsoft Windows Systems Administration* 4107

REQUIRED COURSES		UNITS	In Progress	Completed Grade
† CBIS 225	Microsoft Windows Client OS	2.5		
† CBIS 226	Microsoft Windows Server OS	2.5		
† CBIS 227	Microsoft Windows Networking	2.5		
† CBIS 228	Microsoft Windows Director Services	2.5		
	TOTAL UNITS	**10.0**		

Certificate: *Web Construction* 4108

REQUIRED COURSES		UNITS	In Progress	Completed Grade
† CBIS 207AD	Web Construction I	2		
† CBIS 220	i-Net+ Internet Technologies	3		
† CBIS207E	Dynamic HTML Web Construction	2.5		
Take one of the following courses:				
† CBIS 251	Introduction to ASP.NET	3.5		
† CBIS 420	PHP & My SQL for the Web	3.5		
† CBIS 430	Ruby on Rails Web Development	3.5		
† CBIS 492	ST Interpretive Programming Languages	2.5		
	TOTAL UNITS	**10-11**		

RECOMMENDED, but not required courses		UNITS		
† CBIS 6A	Intro to IT Concepts & Applications	4		
CBIS 41	Networking Fundamentals	3		

Certificate: *Windows Network Administrator* 4086

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

Certificates of Accomplishment continue on the following page:
Certificates of Accomplishment continued from the previous page:

For graduation with a **Certificate of Accomplishment:**
1. Complete the above required units with a minimum grade point average of 2.0 ("C" average).

Track 1 AA = 1123; C-ACH = 3123   Track 2 AA = 1124; C-ACH = 3124
Track 3 AA = 1119; C-ACH = 3119   Track 4 AA = 1125; C-ACH = 3125
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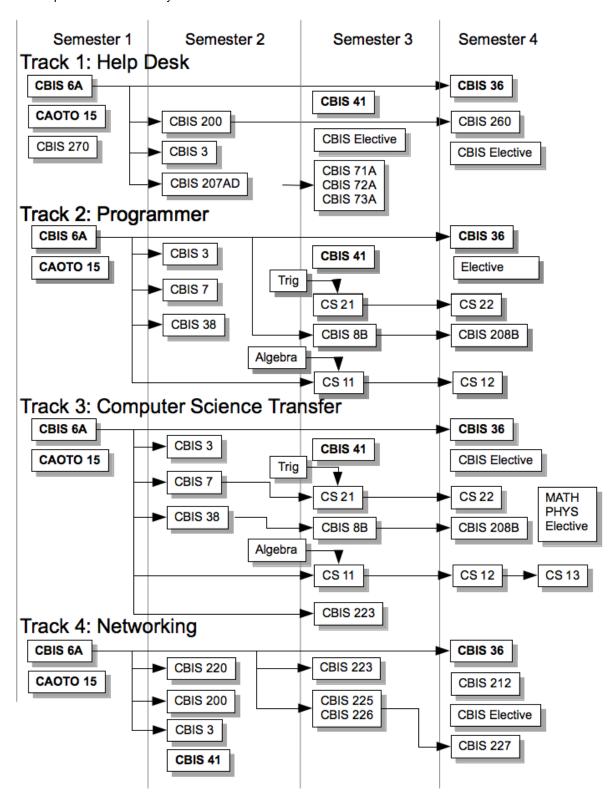2. Fifty percent (50%) or more of the required units must be completed in residence at LBCC.
3. Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at http://admissions.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 **Associate Degree** will prepare students for transfer to the four-year college or university.

Program Mission and Outcomes

The mission of the department is to prepare the students for the first two years of their Information Systems/ Computer Science education. In addition, the department provides professional development and training for individuals employed or seeking entry level positions in the Computer Information Systems and Information Technology job markets.

Outcomes:
1. Choose the correct application for a given task
2. Problem solve common information technology failures

Legend

† This course has a prerequisite or a recommended preparation. Prerequisite courses must be complete with at least a "C" or "P" grade. Refer to the General Catalog (http://www.lbcc.edu/cat/index.html), the Schedule of Classes (http://schedule.lbcc.edu/), or the online Credit Course Outline (http://wdb-asir.lbcc.edu/coursecurriculum/coursedetails/) for specific requisite information.
* CBIS 71, 72, or 73 may be taken during the 2nd, 3rd, or 4th semesters.

₴ *NOTE*: **Effective: Spring 2012** -- Unit level will change for the following courses: ACCTG 1A & 1B 4 units → 5 units, ACCTG 230 1 units →2units, CBIS 223 3 units → 3.5 units, CBIS 260 1 unit →1.5 units.