

Lakeland

COMMUNITY COLLEGE

PROGRAM GUIDE


Applied Studies Division

Information Technology & Computer Science

- Associate of Applied Business Degree in:
 - Application Programming and Development Concentration
 - Computer Science/Software Engineering Concentration
 - Data Analytics Concentration
 - User Support Specialist Major
 - Web Content Developer Concentration
 - Operating Systems/Networking Concentration
- Associate of Technical Studies Degree in Computer Information Technology
- Certificates

 Opportunity
starts **HERE**
lakelandcc.edu

Information Technology & Computer Science



The information technology & computer science (IT & CS) department provides programs of instruction in various programming languages, systems development and support, database development and administration, hardware and software usage and support, and networking.

Career Opportunities

The U.S. Department of Labor projects that software developers, web developers, computer support specialists, database administrators, and network architects will be among the fastest growing occupations through 2022. Lakeland's IT & CS programs can help students gain the skills they need for a solid foundation in information technology as well as an opportunity to specialize in high demand technology fields.

Information Technology & Computer Science

Computer Science/Programming:

- Application Programming and Development Concentration
- Computer Science/Software Engineering Concentration

Database:

- Data Analytics Concentration

Information Systems:

- User Support Specialist Major
- Web Content Developer Concentration

Operating Systems/Networking:

- Operating Systems/Networking Concentration

Associate of Technical Studies Degree in Computer Information Technology

Certificates:

- Computer User
- IT Foundations
- IT Specialist
- IT Professional

Lakeland's Program

Students may pursue the Associate of Applied Business degree, with a concentration in one of six areas, or a certificate in one of four areas. In addition, the Associate of Technical Studies in computer information technology prepares or upgrades the graduate for a career requiring more than one computer-related specialization. The degree programs will take approximately two years of full-time study. The certificate programs are designed for people who wish to acquire new skills or update current ones without completing a degree program.

Lakeland Community College Admission Requirements

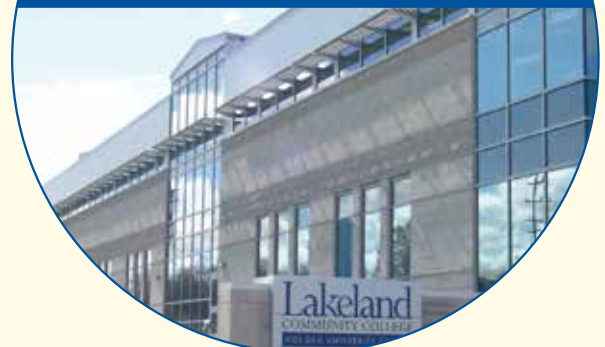
For admission into Lakeland, students must be a high school graduate or have obtained a high school diploma equivalency. Please consult Lakeland Community College's Enrollment Guide (available on Lakeland's website at lakelandcc.edu/enrollment) for specific admissions requirements and procedures.

For more information

1.800.589.8520 • lakelandcc.edu

Information Technology Computer Science Department
440.525.7781

To further your education, Lakeland's Holden University Center offers a variety of bachelor's degree programs from a number of four-year colleges and universities offering you the opportunity to *stay here and go far!* Visit lakelandcc.edu/uc to explore your options.



Application Programming and Development Concentration (9246)

This program prepares students for entry-level software development positions in the high demand field of mobile application development. Students will learn how to develop software and design mobile applications for Apple's iPhone/iPad and Android phone and tablets. The primary languages covered include Swift and Java. Students will use both Apple's Xcode and Android Studio integrated development environments to design, develop, and simulate mobile applications. In addition to employment opportunities, students have the option to continue their education beyond the two-year associate degree program by enrolling in four-year programs at local universities.

NOTE: Students must fulfill the following requirements for this program:

Successfully complete the CIS Tech Prep program **OR** have waived with equivalent high school or college coursework the following course:

ITIS 1005 Computer Essentials or ITIS 1007 Principles of Information Technology and Computer Science

OR

Complete ITIS 1005 Computer Essentials or ITIS 1007 Principles of Information Technology and Computer Science with a grade of "C" or better

NOTE: Students planning to transfer to a four-year college are encouraged to take ENGL 1120 English Composition II in addition to the following requirements.

First Semester

BUSM 1300	..... Introduction to Business	.....	3
ENGL 1110	..... English Composition I (A) ¹		
OR			
ENGL 1111	..... English Composition I (B)	.....	3
FYEX 1000	..... First Year Experience	.....	1
ITCS 1010	..... Programming Logic	.....	3
ITON 1070	..... Operating Systems: Skills and Techniques	.....	1
MATH 1600	..... Survey of College Mathematics ²	.....	3

Credit Hours 14

Second Semester

BUSM 2400	..... Business Communication	.....	3
ITCS 1820	..... Java Programming I	.....	3
ITCS 1825	..... Programming I for iOS (Technical)	.....	3
ITDB 1400	..... Introduction to SQL	.....	2
PEHR 1650	..... Health Fitness	.....	2
Select course(s) from the Social and Behavioral Sciences Electives List			3

Credit Hours 16

Third Semester

BUSM 2200	..... Organizational Behavior	.....	3
ITCS 2820	..... Java/Android Programming II	.....	3
ITCS 2825	..... Programming II for iOS	.....	3
ITIS 1008	..... Ethics in Information Technology	.....	1
ITON 1205	..... Network+ and Networking Essentials	.....	2
Select course(s) from the Arts and Humanities Electives List			3

Credit Hours 15

Fourth Semester

BUSM 1700	..... Principles of E-Business	.....	3
ITCS 2821	..... Java/Android Programming III	.....	2
ITCS 2826	..... Programming III for iOS	.....	2
ITCS 2848	..... .NET Programming	.....	3
ITIS 2890	..... Information Technology and Computer Science Capstone	.....	2
Select course(s) from the Natural Sciences Electives List			3

15

Total Credit Hours 60

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students planning to transfer to a four-year college should take a sequence of math as advised by their counselor.

This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation

requirements policy.

Natural Sciences Electives:

CHEM 1050	..... Chemistry in the Everyday World	.....	3
PSCI 1300	..... Earth Science	.....	3
PSCI 1400	..... Introduction to Meteorology	.....	3
Any other Natural Sciences laboratory course included in the Transfer Module.			

Arts and Humanities Electives

ARTS 1120	..... Art Appreciation	.....	3
ARTS 2220	..... Survey of Art I	.....	3
ARTS 2230	..... Survey of Art II	.....	3
ENGL 2250	..... Survey of American Literature I	.....	3
ENGL 2260	..... Survey of American Literature II	.....	3
ENGL 2280	..... Survey of British Literature I	.....	3
ENGL 2290	..... Survey of British Literature II	.....	3
HUMX 1100	..... Introduction to Humanities	.....	3
HUMX 1200	..... The American Experience in the Arts	.....	3
MUSC 1200	..... Music Appreciation	.....	3
MUSC 1215	..... World Music	.....	3
MUSC 1800	..... Popular Music: Rock, Jazz, Country, and Hip-Hop	.....	3
MUSC 2200	..... Music History and Literature I	.....	3
MUSC 2250	..... Music History and Literature II	.....	3
PHIL 1500	..... Introduction to Philosophy	.....	3
PHIL 2000	..... Comparative Religion	.....	3
PHOT 1000	..... History of Photography	.....	3

Social and Behavioral Sciences Electives

ANTH 1160	..... Introduction to Cultural Anthropology	.....	3
ECON 1150	..... Basic Economics	.....	3
ECON 2500	..... Principles of Macroeconomics	.....	3
ECON 2600	..... Principles of Microeconomics	.....	3
GEOG 1500	..... Introduction to Geography	.....	3
GEOG 1600	..... World Regional Geography	.....	3
GEOG 2500	..... World Cultural Geography	.....	3
HIST 1150	..... Western Civilization I: Antiquity Through the Reformation	.....	3
HIST 1250	..... Western Civilization II: Age of Revolution Through the Present	.....	3
HIST 2150	..... U.S. History: Colonization Through Reconstruction	.....	3
HIST 2250	..... U.S. History: Reconstruction to the Present	.....	3
POLS 1300	..... U.S. National Government	.....	3
POLS 2500	..... Modern Political Ideologies	.....	3
PSYC 1500	..... Introduction to Psychology	.....	3
SOCY 1150	..... Principles of Sociology	.....	3



Computer Information Technology (9720)

The Associate of Technical Studies Degree in Computer Information Technology prepares or upgrades the graduate for career objectives requiring more than one computer-related specialization. Specializations can be combined from within, but not limited to, areas such as computer network support, computer user support, data information analysis, software design and development, web content design, and media studies. Available courses include those that prepare for industry certification from Oracle, Microsoft, CompTIA and Cisco. In addition to employment opportunities, students have the option to continue their education beyond the two-year associate degree program by enrolling in four-year programs at local universities.

The student will be required to complete a sequence of IT core courses which will fulfill the necessary prerequisites before taking additional technical courses. Students will then select a flexible choice of additional technical courses in the format of specializations with an Information Technology & Computer Science/ATS faculty advisor.

Admission requirements include the creation of an individualized degree plan in conjunction with and approved by at least two Information Technology & Computer Science faculty members. Courses taken prior to approval of the degree plan may or may not be approved for inclusion in this degree program.

Required Technical Courses

Core IT courses

ITIS 1007	Principles of Information Technology and Computer Science	3
ITIS 1115	Internet Technologies and Concepts	2

OR


ITON 1205	Network+ and Networking Essentials	
OR		
CNET 1100	Cisco Networking Technology I	
ITCS 1010	Programming Logic	3
ITIS 2015	Information Technology Project Management	3
ITON 1070	Operating Systems: Skills and Techniques	1
Select any ITDB course		2-3

Total Credit Hours 14-15

Additional approved technical courses selected from within at least two of the following areas

Programming and Computer Science (ITCS)	
Database (ITDB)	
Operating Systems and Networking (ITON)	
Information Systems (ITIS)	
Cisco Network Infrastructure (CNET)	
CompTIA A++ (CPET)	
Media Technology (MDIA)	
Core IT Courses	14-15
Additional Technical Credits	15-16

Total Credit Hours 30

 This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

Required Non-Technical Courses

General Studies Courses

ENGL 1110	English Composition I (A) ¹	3
OR		
ENGL 1111	English Composition I (B)	
MATH 1600	Survey of College Mathematics (or higher) ²	3
Select course(s) from the Arts and Humanities Electives list		3
Select course(s) from the Natural Sciences Electives list		3
Select course(s) from the Social and Behavioral Sciences Electives list		3

Total Credit Hours 15

Basic/Related Courses

BUSM 1300	Introduction to Business	3
BUSM 2400	Business Communication	3
FYEX 1000	First Year Experience	1
Additional approved courses selected from the following:		8
Accounting (ACCT)		
Business Management and Marketing (BUSM)		

Total Credit Hours 15

Total Required Technical Course Credits 30
Total Required Non-Technical Course Credits 30

Total Credit Hours 60

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students planning to transfer to a four-year college should take a sequence of math as advised by their counselor.

Natural Science Electives

CHEM 1050	Chemistry in the Everyday World	3
PSCI 1300	Earth Science	3
PSCI 1400	Introduction to Meteorology	3
Any other Natural Sciences laboratory course included in the Transfer Module		

Arts and Humanities Electives

ARTS 1120	Art Appreciation	3
ARTS 2220	Survey of Art I	3
ARTS 2230	Survey of Art II	3
ENGL 2250	Survey of American Literature I	3
ENGL 2260	Survey of American Literature II	3
ENGL 2280	Survey of British Literature I	3
ENGL 2290	Survey of British Literature II	3
HUMX 1100	Introduction to Humanities	3
HUMX 1200	The American Experience in the Arts	3
MUSC 1200	Music Appreciation	3
MUSC 1215	World Music	3
MUSC 1800	Popular Music: Rock, Jazz, Country, and Hip-Hop	3
MUSC 2200	Music History and Literature I	3
MUSC 2250	Music History and Literature II	3
PHIL 1500	Introduction to Philosophy	3
PHIL 2000	Comparative Religion	3
PHOT 1000	History of Photography	3

Social and Behavioral Science Electives

ANTH 1160	Introduction to Cultural Anthropology	3
ECON 1150	Basic Economics	3
ECON 2500	Principles of Macroeconomics	3
ECON 2600	Principles of Microeconomics	3
GEOG 1500	Introduction to Geography	3
GEOG 1600	World Regional Geography	3
GEOG 2500	World Cultural Geography	3
HIST 1150	Western Civilization I: Antiquity Through the Reformation	3
HIST 1250	Western Civilization II: Age of Revolution Through the Present	3
HIST 2150	U.S. History: Colonization Through Reconstruction	3
HIST 2250	U.S. History: Reconstruction to the Present	3
POLS 1300	U.S. National Government	3
POLS 2500	Modern Political Ideologies	3
PSYC 1500	Introduction to Psychology	3
SOCY 1150	Principles of Sociology	3

Computer Science/Software Engineering Concentration (9259)

This concentration is designed for students planning to transfer to a computer science or computer information systems program at a four-year college. In addition to being a transfer program, this program will help students who are interested in game and entertainment programming acquire the fundamental skills to get started. Students should consult a Lakeland counselor prior to beginning this program in order to ensure maximum transferability.

NOTE: Students must fulfill the following requirements for this program:

Place into MATH 1700 Trigonometry OR complete MATH 1650 College Algebra with a "C" grade or higher

Successfully complete the CIS Tech Prep program OR have waived with equivalent high school OR college coursework the following course:

ITIS 1005 Computer Essentials OR complete ITIS 1005 Computer Essentials with a "C" grade or higher

OR

ITIS 1007 Principles of Information Technology and Computer Science OR complete ITIS 1007 Principles of Information Technology and Computer Science with a "C" grade or higher

OR

Pass the AP Computer Science Principles Exam with a "3" or higher

NOTE: Students planning to transfer to a four-year college are encouraged to take ENGL 1120 English Composition II in addition to the following requirements.

First Semester

CPET 1120	.....C Programming for Engineering Technology	3
ENGL 1110	.....English Composition I (A) ¹	
OR		
ENGL 1111	.....English Composition I (B)	3
FYEX 1000	.....First Year Experience	1
ITCS 1010	.....Programming Logic	3
ITON 1011	.....Comparative Analysis of Microcomputer Operating Systems	2
ITON 1070	.....Operating Systems: Skills and Techniques	1
MATH 1700	.....Trigonometry	3

Credit Hours 16

Second Semester

BUSM 1300	.....Introduction to Business	3
BUSM 2400	.....Business Communication	3
ITCS 1820	.....Java Programming I	3
ITCS 1870	.....Python Programming I	3
MATH 2500	.....Calculus and Analytical Geometry I	5

Credit Hours 17

Third Semester

CHEM 1500	.....General Chemistry I ²	
OR		
PHYS 2410	.....Science and Engineering Physics I	5
ITCS 2080	.....Fundamentals of Software Engineering	3
ITCS 2870	.....Data Structures	4
MATH 2600	.....Calculus and Analytical Geometry II	5

Credit Hours 17

Fourth Semester

ITCS 2012	.....Discrete Structures	3
ITCS 2875	.....Computer Architecture and Organization	3
ITDB 1400	.....Introduction to SQL	2
ITIS 2890	.....Information Technology and Computer Science Capstone	2
ITON 1205	.....Network+ and Networking Essentials	2
Select course(s) from the Arts and Humanities Electives list		3

Credit Hours 15

Total Credit Hours 65

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students should discuss the choice of science courses with their advisor.

This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

Arts and Humanities Electives

ARTS 1120	.....Art Appreciation	3
ARTS 2220	.....Survey of Art I	3
ARTS 2230	.....Survey of Art II	3
ENGL 2250	.....Survey of American Literature I	3
ENGL 2260	.....Survey of American Literature II	3
ENGL 2280	.....Survey of British Literature I	3
ENGL 2290	.....Survey of British Literature II	3
HUMX 1100	.....Introduction to Humanities	3
HUMX 1200	.....The American Experience in the Arts	3
MUSC 1200	.....Music Appreciation	3
MUSC 1215	.....World Music	3
MUSC 1800	.....Popular Music: Rock, Jazz, Country, and Hip-Hop	3
MUSC 2200	.....Music History and Literature I	3
MUSC 2250	.....Music History and Literature II	3
PHIL 1500	.....Introduction to Philosophy	3
PHIL 2000	.....Comparative Religion	3
PHOT 1000	.....History of Photography	3



Data Analytics Concentration (9258)

This program prepares students for entry-level employment in the field of data analytics. Students will gain understanding in data modeling, database normalization, and SQL for data processing and obtain skills and utilize tools that are necessary for data storage, processing, analysis, visualization and application issues. Data analysts are responsible for extracting, categorizing and analyzing data, in order to identify patterns, behaviors and trends, as well as utilizing different reporting, modeling and analytical techniques. In addition to employment opportunities, students have the option to continue their education beyond the two-year associate degree program by enrolling in four-year programs at local universities.

NOTE: Students planning to transfer to a four-year college are encouraged to take ENGL 1120 English Composition II in addition to the following requirements.

First Semester

BUSM 1300	Introduction to Business	3
ENGL 1110	English Composition I (A) ¹	

OR

ENGL 1111	English Composition I (B)	3
FYEX 1000	First Year Experience	1
ITIS 1007	Principles of Information Technology and Computer Science	3
MATH 1600	Survey of College Mathematics ²	3
Select course(s) from the Arts and Humanities Electives list		3

Credit Hours 16

Second Semester

ITCS 1010	Programming Logic	3
ITDB 1300	Introduction to Database Theory	2
ITIS 1520	Microsoft Office Excel: Skills and Techniques	3
MATH 1550	Statistics	4

1st 8 weeks

ITDB 1400	Introduction to SQL	2
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2nd 8 weeks

ITDB 1405	Oracle PL/SQL Programming	2
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Credit Hours 16

Third Semester

BUSM 2400	Business Communication	3
ITCS 1880	R Programming I	3
ITON 1070	Operating Systems: Skills and Techniques	1
ITON 1205	Network+ and Networking Essentials	2
Select course(s) from the Natural Sciences Electives list		3
Select course from one of the Data Analytics Pathway Electives list		3

Credit Hours 15

Fourth Semester


ITCS 1870	Python Programming I	3
ITDB 2500	Data Analytics	3
ITIS 2890	Information Technology and Computer Science Capstone	2
ITON 1748	Linux Administration I	3
Select courses(s) from the Social and Behavioral Sciences Electives list		3
Select course(s) from the Technical Electives list		3

Credit Hours 17

Total Credit Hours 64

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students planning to transfer to a four-year college should take a sequence of math as advised by their counselor.

 This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

Data Analytics Pathways

Electives for Bioscience/Science Analytics Pathway

BIOL 1030	Environmental Issues and Solutions	3
BIOL 1140	Human Biology	3
BIOL 1170	Ecology and Environmental Biology	4
BIOL 1200	Fundamentals of Biology for the Health Technologies	4
BIOS 1050	Introduction to Biotechnology Science	3
CHEM 1050	Chemistry in the Everyday World	3

OR

Electives for Business Analytics Pathway

ACCT 1100	Introduction to Financial Accounting	4
BUSM 1330	Business Ethics	3
BUSM 1500	International Business in a Global Environment	3
BUSM 1700	Principles of E-Business	3
BUSM 1800	Essentials of Management and Supervision	3
FINN 1300	Financial Management for the Small Business	3

OR

Electives for History/Political Science Pathway

HIST 1150	Western Civilization I: Antiquity Through the Reformation	3
HIST 1250	Western Civilization II: Age of Revolution Through the Present	3
HIST 1450	World Civilization I: The Ancient and Medieval World	3
HIST 1550	World Civilization II: The Modern World	3
HIST 2150	U.S. History: Colonization Through Reconstruction	3
HIST 2250	U.S. History: Reconstruction to the Present	3
HIST 2600	Ohio History	3
HIST 2750	Latin American History	3
POLS 1300	U.S. National Government	3

Technical Electives

ITCS 1105	Web Programming I	3
ITCS 2010	Systems Analysis	3
ITCS 2820	Java/Android Programming II	3
ITDB 1406	Microsoft SQL Concepts	2
ITDB 1430	Microsoft Access Relational Database	3
ITDB 2417	Oracle Database Administration	3
ITDB 2427	Microsoft SQL Server Administration	3
ITIS 1530	Microsoft Office Access: Skills and Techniques	3
ITIS 2015	Information Technology Project Management	3
ITON 2070	Installing and Configuring Windows 10	2
Any Information Technology (ITCS, ITDB, ITIS, ITON) course(s) except ITIS 1000		3

Natural Sciences Electives

CHEM 1050	Chemistry in the Everyday World	3
PSCI 1300	Earth Science	3
PSCI 1400	Introduction to Meteorology	3
Any other Natural Sciences laboratory course included in the Transfer Module		

Arts and Humanities Electives

ARTS 1120	Art Appreciation	3
ARTS 2220	Survey of Art I	3
ARTS 2230	Survey of Art II	3
ENGL 2250	Survey of American Literature I	3
ENGL 2260	Survey of American Literature II	3
ENGL 2280	Survey of British Literature I	3
ENGL 2290	Survey of British Literature II	3
HUMX 1100	Introduction to Humanities	3
HUMX 1200	The American Experience in the Arts	3
MUSC 1200	Music Appreciation	3
MUSC 1215	World Music	3
MUSC 1800	Popular Music: Rock, Jazz, Country, and Hip-Hop	3
MUSC 2200	Music History and Literature I	3
MUSC 2250	Music History and Literature II	3
PHIL 1500	Introduction to Philosophy	3
PHIL 2000	Comparative Religion	3
PHOT 1000	History of Photography	3



Social and Behavioral Sciences Electives

ANTH 1160 Introduction to Cultural Anthropology 3
 ECON 1150 Basic Economics 3
 ECON 2500 Principles of Macroeconomics 3
 ECON 2600 Principles of Microeconomics 3
 GEOG 1500 Introduction to Geography 3
 GEOG 1600 World Regional Geography 3
 GEOG 2500 World Cultural Geography 3
 HIST 1150 Western Civilization I: Antiquity Through the Reformation . 3
 HIST 1250 Western Civilization II: Age of Revolution
 Through the Present 3
 HIST 2150 U.S. History: Colonization Through Reconstruction 3
 HIST 2250 U.S. History: Reconstruction to the Present 3
 POLS 1300 U.S. National Government 3
 POLS 2500 Modern Political Ideologies 3
 PSYC 1500 Introduction to Psychology 3
 SOCY 1150 Principles of Sociology 3

Operating Systems/Networking Concentration (9249)

The Operating Systems/Networking Concentration provides coverage of all aspects of installing, administering and managing heterogeneous local and wide area networks. Based on Lakeland's status as a Microsoft Imagine Academy, instruction included in the emphasis helps prepare students and professionals for multiple vendor and vendor neutral certifications such as CompTIA Networking+, CompTIA Security+, and Microsoft Certified Solution Associate (MCSA). In addition to employment opportunities, students have the option to continue their education beyond the two-year associate degree program by enrolling in four-year programs at local universities.

NOTE: Students planning to transfer to a four-year college are encouraged to take ENGL 1120 English Composition II in addition to the following requirements.

First Semester

BUSM 1300 Introduction to Business 3
 ENGL 1110 English Composition I (A)¹
OR
 ENGL 1111 English Composition I (B) 3
 FYEX 1000 First Year Experience 1
 ITIS 1007 Principles of Information Technology
 and Computer Science 3
 ITON 1070 Operating Systems: Skills and Techniques 1
 ITON 1205 Network+ and Networking Essentials 2
 MATH 1600 Survey of College Mathematics 2 3

Credit Hours 16

Second Semester

BUSM 2200 Organizational Behavior 3
 BUSM 2400 Business Communication 3
 ITCS 1010 Programming Logic 3
 ITON 1748 Linux Administration I 3

1st 8 weeks

ITON 2070 Installing and Configuring Windows 10 2

2nd 8 weeks

ITON 2240 Installing and Configuring Windows Server 2012 2

Credit Hours 16

Third Semester

ITIS 1025 Managing and Optimizing Personal Computers 3
 ITIS 1355 Security+ and Security Essentials 3
 ITON 1758 Linux Administration II 3
 ITON 2750 Shell Script Programming 2
 PEHR 1650 Health Fitness 2

1st 8 weeks

ITON 2241 Administering Windows Server 2012 2

2nd 8 weeks

ITON 2242 Configuring Advanced Windows Server 2012 2

Credit Hours 17

Fourth Semester

ITIS 2890 Information Technology and
 Computer Science Capstone 2
 ITON 2071 Configuring Windows Devices 2
 ITON 2768 Linux Administration III 3
 Select course(s) from the Arts and Humanities Electives list 3
 Select course(s) from the Natural Sciences Electives list 3
 Select course(s) from the Social and Behavioral Sciences Electives list 3

Credit Hours 16
Total Credit Hours 65

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students planning to transfer to a four-year college should take a sequence of math as advised by their counselor.

This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

Natural Sciences Electives

CHEM 1050 Chemistry in the Everyday World 3
 PSCI 1300 Earth Science 3
 PSCI 1400 Introduction to Meteorology 3
 Any other Natural Sciences laboratory course included in the Transfer Module.

Arts and Humanities Electives

ARTS 1120 Art Appreciation 3
 ARTS 2220 Survey of Art I 3
 ARTS 2230 Survey of Art II 3
 ENGL 2250 Survey of American Literature I 3
 ENGL 2260 Survey of American Literature II 3
 ENGL 2280 Survey of British Literature I 3
 ENGL 2290 Survey of British Literature II 3
 HUMX 1100 Introduction to Humanities 3
 HUMX 1200 The American Experience in the Arts 3
 MUSC 1200 Music Appreciation 3
 MUSC 1215 World Music 3
 MUSC 1800 Popular Music: Rock, Jazz, Country, and Hip-Hop 3
 MUSC 2200 Music History and Literature I 3
 MUSC 2250 Music History and Literature II 3
 PHIL 1500 Introduction to Philosophy 3
 PHIL 2000 Comparative Religion 3
 PHOT 1000 History of Photography 3

Social and Behavioral Sciences Electives

ANTH 1160 Introduction to Cultural Anthropology 3
 ECON 1150 Basic Economics 3
 ECON 2500 Principles of Macroeconomics 3
 ECON 2600 Principles of Microeconomics 3
 GEOG 1500 Introduction to Geography 3
 GEOG 1600 World Regional Geography 3
 GEOG 2500 World Cultural Geography 3
 HIST 1150 Western Civilization I: Antiquity Through the Reformation . 3
 HIST 1250 Western Civilization II: Age of Revolution
 Through the Present 3
 HIST 2150 U.S. History: Colonization Through Reconstruction 3
 HIST 2250 U.S. History: Reconstruction to the Present 3
 POLS 1300 U.S. National Government 3
 POLS 2500 Modern Political Ideologies 3
 PSYC 1500 Introduction to Psychology 3
 SOCY 1150 Principles of Sociology 3

User Support Specialist Major (9243)

This program provides students with expertise in supporting business computer applications and operating systems. It includes a study of hardware and software installation, the use and support of common operating systems, networking, and security. Graduates are prepared to tailor hardware and software based on user needs and to provide end-user support and training. Career opportunities include help desk support, technical computer training, computer consulting, and information technologies employment. According to the U.S Bureau of Labor Statistics, the employment of computer support specialists is projected to grow 12 percent through 2024, faster than the average for all occupations. Courses within this program help students to prepare for industry certification exams, including Microsoft, Oracle, and CompTIA. The typical education required to become a help desk support technician is an associate degree; however, students have the option to continue their education by enrolling in four-year programs at local universities.

NOTE: Students planning to transfer to a four-year college are encouraged to take ENGL 1120 English Composition II in addition to the following requirements.

First Semester

BUSM 1300	Introduction to Business	3
ENGL 1110	English Composition I (A) ¹	
OR		
ENGL 1111	English Composition I (B)	3
FYEX 1000	First Year Experience	1
ITIS 1007	Principles of Information Technology and Computer Science	3
MATH 1600	Survey of College Mathematics ²	3
Select course(s) from the Arts and Humanities Electives list		3

Credit Hours 16

Second Semester

BUSM 2200	Organizational Behavior	3
ITCS 1010	Programming Logic	3
ITIS 1025	Managing and Optimizing Personal Computers	3
ITIS 1510	Microsoft Office Word: Skills and Techniques	3
ITIS 1520	Microsoft Office Excel: Skills and Techniques	3
ITON 1070	Operating Systems: Skills and Techniques	1

Credit Hours 16

Third Semester

BUSM 2400	Business Communication	3
ITIS 2015	Information Technology Project Management	3
ITIS 2510	Help Desk Concepts and Management	3
ITON 1205	Network+ and Networking Essentials	2
PEHR 1650	Health Fitness	2
Select course(s) from the Natural Sciences Electives list		3

Credit Hours 16

Fourth Semester


ITDB 1400	Introduction to SQL	2
ITIS 1355	Security+ and Security Essentials	3
ITIS 2890	Information Technology and Computer Science Capstone	2
ITON 1748	Linux Administration I	3
ITON 2070	Installing and Configuring Windows 10	2
Select courses(s) from the Social and Behavioral Sciences Electives list		3

Credit Hours 15

Total Credit Hours 63

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students planning to transfer to a four-year college should take a sequence of math as advised by their counselor.

 This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

Arts and Humanities Electives

ARTS 1120	Art Appreciation	3
ARTS 2220	Survey of Art I	3
ARTS 2230	Survey of Art II	3
ENGL 2250	Survey of American Literature I	3
ENGL 2260	Survey of American Literature II	3
ENGL 2280	Survey of British Literature I	3
ENGL 2290	Survey of British Literature II	3
HUMX 1100	Introduction to Humanities	3
HUMX 1200	The American Experience in the Arts	3
MUSC 1200	Music Appreciation	3
MUSC 1215	World Music	3
MUSC 1800	Popular Music: Rock, Jazz, Country, and Hip-Hop	3
MUSC 2200	Music History and Literature I	3
MUSC 2250	Music History and Literature II	3
PHIL 1500	Introduction to Philosophy	3
PHIL 2000	Comparative Religion	3
PHOT 1000	History of Photography	3

Social and Behavioral Sciences Electives

ANTH 1160	Introduction to Cultural Anthropology	3
ECON 1150	Basic Economics	3
ECON 2500	Principles of Macroeconomics	3
ECON 2600	Principles of Microeconomics	3
GEOG 1500	Introduction to Geography	3
GEOG 1600	World Regional Geography	3
GEOG 2500	World Cultural Geography	3
HIST 1150	Western Civilization I: Antiquity Through the Reformation	3
HIST 1250	Western Civilization II: Age of Revolution Through the Present	3
HIST 2150	U.S. History: Colonization Through Reconstruction	3
HIST 2250	U.S. History: Reconstruction to the Present	3
POLS 1300	U.S. National Government	3
POLS 2500	Modern Political Ideologies	3
PSYC 1500	Introduction to Psychology	3
SOCY 1150	Principles of Sociology	3



Web Content Developer Concentration (9251)

This program provides students with skills necessary to understand, use, and develop Internet services and resources. In addition, the program will help students become web developers who are responsible for the look and technical aspects of a web site. Students will create content-rich sites that use various forms of media as well as basic interactive programming techniques. Projects will emphasize business, home-office, and personal applications. According to the U.S. Bureau of Labor Statistics, the employment of web developers is projected to grow 15 percent through 2026, much faster than the average for all occupations. The typical education needed to become a web developer is an associate degree; however, students have the option to continue their education by enrolling in four-year programs at local universities.

NOTE: Students must fulfill the following requirements for this program:

Successfully complete the CIS Tech Prep program OR have waived with equivalent high school or college coursework the following course:

ITIS 1005 Computer Essentials or ITIS 1007 Principles of Information Technology and Computer Science

OR
Complete ITIS 1005 Computer Essentials or ITIS 1007 Principles of Information Technology and Computer Science with a grade of "C" or better

NOTE: Students who are interested in additional skills should also consider: ITCS 2105 Web Programming II, ITCS 2170 Introduction to ASP.NET, ITDB 1405 Oracle PL/SQL Programming, and ITON 1748 Linux Administration I. Students may need to complete additional prerequisite courses.

NOTE: Students planning to transfer to a four-year college are encouraged to take ENGL 1120 English Composition II in addition to the following requirements.

First Semester

BUSM 1300	Introduction to Business	3
ECON 2600	Principles of Microeconomics	3
ENGL 1110	English Composition I (A) ¹	
OR		
ENGL 1111	English Composition I (B)	3
FYEX 1000	First Year Experience	1
ITCS 1010	Programming Logic	3
ITIS 1100	Internet: Services, Tools and Web Page Creation	2
ITON 1070	Operating Systems: Skills and Techniques	1

Credit Hours 16

Second Semester

BUSM 2400	Business Communication	3
ITCS 1105	Web Programming I	3
ITCS 1820	Java Programming I	3
ITDB 1400	Introduction to SQL	2
ITIS 1130	Introduction to Web Design	1
Select course(s) from the Technical Electives list		3

Credit Hours 15

Third Semester

BUSM 2500	Principles of Marketing	3
ITCS 2120	JavaScript Programming I	3
ITIS 1108	Using an HTML Editor	2
PHOT 2300	Introduction to Digital Photo Imaging	3
Select course(s) from the Natural Sciences Electives list		3
Select course(s) from the Technical Electives list		2

Credit Hours 16

Fourth Semester

BUSM 2550	Direct and Internet Marketing ²	3
ITIS 1008	Ethics in Information Technology	1
ITIS 2890	Information Technology and Computer Science Capstone	2
MATH 1600	Survey of College Mathematics ³	3
PEHR 1650	Health Fitness	2
Select course(s) from the Arts and Humanities Electives list		3
Select course(s) from the Technical Electives list		2

Credit Hours 16

Total Credit Hours 63

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

²Students may substitute BUSM 2520 Marketing of Services, BUSM 2530 Advertising, or BUSM 2560 International Marketing for BUSM 2550 Direct and Internet Marketing.

³Students planning to transfer to a four-year college should take a sequence of math as advised by their counselor.

This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

Technical Electives

GRDS 1010	Visual Organization	3
GRDS 1015	Introduction to Typography	3
GRDS 1020	Graphic Design	3
ITCS 2105	Web Programming II	3
ITCS 2170	Introduction to ASP.NET	2
ITCS 2820	Java/Android Programming II	3
ITDB 1405	Oracle PL/SQL Programming	2
ITIS 1030	Security Awareness	1
ITIS 1115	Internet Technologies and Concepts	2
ITIS 1530	Microsoft Office Access: Skills and Techniques	3
ITON 1205	Network+ and Networking Essentials	2
PHOT 1105	Basic Photography - Digital	3
PHOT 2350	Advanced Digital Photo Imaging	3

Natural Sciences Electives

CHEM 1050	Chemistry in the Everyday World	3
PSCI 1300	Earth Science	3
PSCI 1400	Introduction to Meteorology	3
Any other Natural Sciences laboratory course included in the Transfer Module.		

Arts and Humanities Electives

ARTS 1120	Art Appreciation	3
ARTS 2220	Survey of Art I	3
ARTS 2230	Survey of Art II	3
ENGL 2250	Survey of American Literature I	3
ENGL 2260	Survey of American Literature II	3
ENGL 2280	Survey of British Literature I	3
ENGL 2290	Survey of British Literature II	3
HUMX 1100	Introduction to Humanities	3
HUMX 1200	The American Experience in the Arts	3
MUSC 1200	Music Appreciation	3
MUSC 1215	World Music	3
MUSC 1800	Popular Music: Rock, Jazz, Country, and Hip-Hop	3
MUSC 2200	Music History and Literature I	3
MUSC 2250	Music History and Literature II	3
PHIL 1500	Introduction to Philosophy	3
PHIL 2000	Comparative Religion	3
PHOT 1000	History of Photography	3

IT Foundations Certificate (2401)

This certificate is designed to prepare students for employment in a variety of positions requiring fundamental information technology knowledge and skills. It also fulfills one of the designated steps leading to completion for several IT degree concentrations.

ITCS 1010	Programming Logic	3
ITIS 1005	Computer Essentials	3
OR		
ITIS 1007	Principles of Information Technology and Computer Science	1
ITON 1070	Operating Systems: Skills and Techniques	1
Total Credit Hours		7

IT Specialist Certificate (2403)

This certificate builds upon previous information technology foundational skills by providing core competencies as well as breadth and/or depth. It is designed to prepare students for employment in a variety of positions requiring more specialized computer knowledge and skills. It also fulfills one of the designated steps leading to completion for all of the IT degree concentrations.

Completion of the IT Foundations Certificate		7
OR		
Completion of ITCS 1010		
AND		
Completion of 4 additional credits in ITCS, ITDB, ITIS, ITON courses		
Select courses from the Information Technology Electives list		8
Total Credit Hours		15

Information Technology Electives

At least one course must be selected from the following courses which help students prepare for industry certification:

ITDB 1400	Introduction to SQL	2
ITDB 1405	Oracle PL/SQL Programming	2
ITDB 1406	Microsoft SQL Concepts	2
ITDB 2417	Oracle Database Administration	3
ITDB 2427	Microsoft SQL Server Administration	3
ITIS 1355	Security+ and Security Essentials	3
ITIS 2015	Information Technology Project Management	3
ITIS 2355	Security Investigation and Penetration Studies	3
ITON 1205	Network+ and Networking Essentials	2
ITON 1748	Linux Administration I	3
ITON 1758	Linux Administration II	3
ITON 2070	Installing and Configuring Windows 10	2
ITON 2071	Configuring Windows Devices	2
ITON 2232	Core Solutions of Microsoft Office SharePoint Server	2
ITON 2240	Installing and Configuring Windows Server 2012	2
ITON 2241	Administering Windows Server 2012	2
ITON 2242	Configuring Advanced Windows Server 2012	2
ITON 2768	Linux Administration III	3

Remaining credits can be taken from within the above list or any other Information Technology (ITCS, ITDB, ITIS, ITON) courses.

IT Professional Certificate (2404)

This certificate builds upon previous information technology proficiency skills by providing professional competencies as well as an additional breadth and depth. It is designed to prepare students for employment in a variety of positions requiring a professional level of computer knowledge and skills. It also fulfills one of the designated steps leading to completion for all of the IT degree concentrations.

Completion of the IT Specialist Certificate		15
ENGL 1110	English Composition I (A) ¹	3
or ENGL 1111		English Composition I (B)
Select courses from the Business Management Electives list		3
Select courses from the Information Technology Electives list		9
Total Credit Hours		30

¹English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

Information Technology Electives

Any Information Technology (ITCS, ITDB, ITIS, ITON) courses.

Business Management Electives

BUSM 1300	Introduction to Business	3
BUSM 2200	Organizational Behavior	3
BUSM 2400	Business Communication	3

For more information about our graduation rates, the median debt of students who completed the program, and other important information, please view this program's Gainful Employment information.

Computer User Certificate (2402)

This certificate is designed to prepare students for employment in a variety of positions requiring fundamental computer knowledge and skills.

Requirements

Select one of the following:		1-3
ITIS 1000	Basic Computer Skills	
ITIS 1005	Computer Essentials	
ITIS 1007	Principles of Information Technology and Computer Science	
ITON 1070	Operating Systems: Skills and Techniques	1
Select course(s) from the Microsoft Office Electives list		2-3

Total Credit Hours 4-7

Electives

Microsoft Office Electives

ITIS 1510	Microsoft Office Word: Skills and Techniques	3
ITIS 1520	Microsoft Office Excel: Skills and Techniques	3
ITIS 1530	Microsoft Office Access: Skills and Techniques	3
ITIS 1540	Microsoft Office PowerPoint: Skills and Techniques	2
ITIS 1550	Using Microsoft Office: Word and Excel	3



Apple iOS: Mobile Application Development Certificate (2462)

This certificate is designed to prepare students for employment in mobile application development for Apple iOS devices.

ITCS 1825	.....Programming I for iOS.....	3
ITCS 2825	.....Programming II for iOS.....	3
ITCS 2826	.....Programming III for iOS.....	2
Total Credit Hours		8

Java/Android: Mobile Application Development Certificate (2459)

This certificate is designed to prepare students for employment in mobile application development for Android devices.

ITCS 1820	.....Java Programming I.....	3
ITCS 2820	.....Java/Android Programming II.....	3
ITCS 2821	.....Java/Android Programming III.....	2
Total Credit Hours		8

Graphic Design for the Web Certificate (2513)

This certificate is designed to meet the growing demand for graphic designers and web content developers who are proficient in skill sets such as basic web programming, the Adobe Creative Suite, and other tools and principles of graphic and web design. The Graphic Design for the Web Certificate will allow Graphic Design majors to begin to acquire knowledge for front-end web development, and allow IT&CS Web Content Developers the opportunity to acquire knowledge in basic graphic design.

First Semester

GRDS 1015	.....Introduction to Typography.....	3
GRDS 1375	.....Computer Graphics AI, ID and PS.....	3
MDIA 1500	.....Interactive Media I: Introduction to Interactive Production.....	3
Credit Hours		9

Second Semester

ITCS 1105	.....Web Programming I.....	3
ITIS 1108	.....Using an HTML Editor.....	2
ITIS 1130	.....Introduction to Web Design.....	1
GRDS 2400	.....Automating Adobe Creative Suite Products with JavaScript.....	3
Credit Hours		9
Total Credit Hours		18

For more information about our graduation rates, the median debt of students who completed the program, and other important information, please view this program's Gainful Employment information.



Build your career in Technology

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Why start a career in technology?

- The world is **modernizing systems**, and qualified tech workers are in high demand.
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- DevOps engineers
- Help desk and desktop support professionals
- Network administrators
- Security professionals
- Systems administrators

For more information, call **440.525.7781** or visit **lakelandcc.edu/ITCS**.

Sources: Robert Half Technology, Bureau of Labor Statistics

Information Technology and Computer Science



Curriculum and program requirements are subject to change. Find the most up-to-date information in the college catalog, available on the website at lakelandcc.edu.



Quality Education

Lakeland prepares you for a high-demand career or for transfer to a four-year college or university. Professors at Lakeland are experts in their fields with real-world experience. Small class sizes allow for personalized attention.



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Lakeland offers convenient day, evening and weekend class times, and a growing number of online courses. The main campus in Kirtland is only 20 miles northeast of Cleveland. Classes are also offered in Madison.



Focus on Students

Lakeland offers a variety of student services to help you succeed, such as counseling, tutoring, wireless computer labs, career services, free parking, and affordable child care.



Accreditation

Lakeland Community College is accredited through the Higher Learning Commission (HLC) and participates in the Academic Quality Improvement Program (AQIP). The Higher Learning Commission, 230 South LaSalle Street, Suite 7-500, Chicago, IL 60604-1413, phone: 800.621.7440, hlcommission.org.

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