Computer Information Technologies Program
Lansing Community College

2016-2017 Curriculum Packet

Technical Careers Division
West Campus
Room M103
Phone: (517) 483-1336

www.lcc.edu/cit

Contents

Lansing Community College is accredited by the Higher Learning Commission, a commission member of the North Central Association of Colleges and Schools. The commission can be contacted at www.ncahlc.org or by phone at (800) 621-7440. Its mailing address is 230 South LaSalle Street, Suite 7-500, Chicago, IL 60604. The main campus of Lansing Community College is located in downtown Lansing. Student service offices are located at 422 N. Washington Square and can be contacted at www.lcc.edu or by phone at (517) 483-1957.

When you come to Lansing Community College for our Computer Information Technology programs, you will learn the most current technological practices from outstanding instructors with real-world experience. Our continually upgraded equipment, fully equipped computer labs and small class sizes add up to an excellent combination of quality education and training at an affordable price.

You'll have plenty of options for on-campus or community-based learning, or you can take classes from anywhere in the world through our online options. If a bachelor's degree is in your plans, we offer countless options to seamlessly transfer to four-year institutions. Students focused on immediate work opportunities can benefit from our state-of-the-art digital program, apprenticeship programs and work placement options focused on technical training.

Check us out. Choose your path. Be part of the IT movement today!

We offer seven different areas of concentration in Computer Information Technology that lead to a variety of degrees and certificates. Whatever your interests, LCC has you covered in the technological arena.

1. CIT Applications
Certificate

Become certified as a Microsoft Office Specialist and prepare to take the Microsoft Certified Applications Specialist exams through our CIT Applications program. You'll learn from the experts and pick up valuable skills in using Word, Excel, Access, PowerPoint and Outlook.

2. CIT Foundations
Associate Degree, Certificates

CIT Foundations offers a range of coursework for seasoned professionals and students seeking basic technology skills for entry-level careers. Options include preparatory learning, information systems, coursework centered on job readiness, software productivity tools, software support, workplace communication and IT project management.

3. CIT Networking
Associate Degree, Certificate

Fine-tune your problem-solving abilities and learn how to keep in-house computer networks stable and secure through our CIT Networking area of study. Comprehensive coursework prepares our students for a career as a network and security administrator, residential network specialist and convergence technology specialist. Students will have the opportunity to earn recognizable industry credentials including Cisco Certification.

4. CIT Programming
Associate Degree, Certificate

Jump onboard the #1 degree program in CIT that students are completing. Through this concentration students learn object-oriented programming languages designed for Windows or Web environments as well as everyday business use. Our CIT Programming

classes begin with instruction in the Python language and continue with classes in VB.Net, Java, C#.Net, and ASP.Net. Students can learn skills related to Web design, development and management, SQL, Dreamweaver, PHP and mobile application development for both Apple and Android platforms. This top program prepares our students for a career as a Programmer Analyst or Software Tester.

5. CIT Support and Repair
Associate Degrees, Certificate

Equip yourself with the knowledge to install, modify and make repairs to computer hardware and software systems as well as provide technical assistance and training to system users. Our CIT Support and Repair concentration also trains students to load software packages, instruct computer users, and diagnose hardware, software and operator issues. Technicians that complete this program are trained to support the user from the individual level to the enterprise level.

6. CIT Web
Associate Degree, Certificates

Set yourself up to be a skilled professional creating, planning, building and maintaining Web sites. Our CIT Web area of study will show you how to combine new technologies and innovative approaches to meet the virtual communication needs of a widespread range of clients including large corporations or organizations, small businesses and private individuals.

7. Geographical Information System
Associate Degree, Certificate

Set your course for the fastest growing employment sector in the field of Geographic Information Systems. You'll learn digital mapping and spatial analysis skills that will show you how to collect and manipulate demographic and land characteristic data to prepare a host of digital reports.

CIT Program Offerings	***Certificate***	***Degree***
Networking:		
Residential Networking Specialist	☑	
Convergence Technology	☑	
Cisco Certified Network Association Certificate of Preparation (CCNA)	☑	
Computer Networking & Cybersecurity		☑
Programming:		
Mobile Application Developer	☑	
Computer Software Tester	☑	
Computer Programmer/Analyst	☑	☑
E-Business and Web related:		
Web Site Developer	☑	
E-Business	☑	☑
Computer Repair:		
Computer Repair Technician	☑	
Computer Repair & Support Technician		☑
Computer Support:		
Microsoft Office Specialist	☑	

Computer Support Specialist		☑
Computer Basics:		
Information Technologies Foundations	☑	
Computer Technology Basics	☑	
Geographical Information Systems:		
GIS/Geospatial Technology		☑
Geographical Information Systems	☑	

LCC's Computer Information Technology programs' broad range of resources offers students the education, credentials, and work experience to succeed. Upon completion in one of our programs or through joining an expansive and immersive learning environment in CIT, you will be well prepared and able to adapt to any IT environment.

Digital Innovation Institute

Get the know-how you'll need to be on the forefront of digital technology. With a fully equipped and dedicated computer lab, LCC's Digital Innovation program provides real-world experience in application development, game development, and 3D modeling. For more details, visit http://lcc-dii.org/.

Trades & Technology Services

The Technical Careers Division is committed to helping both LCC Computer & Information Technology students and employers connect with each other. Trades & Technology Services offers a variety of services to assist both students and employers. Wyn Wilson, IT Apprenticeship Coach, is the primary contact for such assistance.

Wyn Wilson
IT Apprenticeship Coach
wilsonjw@lcc.edu
517-483-1157

Student assistance available includes:

- IT job search assistance for IT internships, apprenticeships, regular part-time, and regular full-time employment;
- Resume writing and cover letters;
- Interview skills including mock (practice) interviews;
- Company information sessions;
- Company on-campus recruitment activities;
- IT Speed Networking (Friday, October 28, 2016);
- LCC Campus Wide Job Fair (Tuesday, February 21, 2017);
- Online job posting site (LCC-Symplicity - https://lcc-csm.symplicity.com/).

Employer assistance available includes:

- Online job posting site (LCC-Symplicity - https://lcc-csm.symplicity.com/) at no charge;
- Company visits;
- Student engagement opportunities including:
    - IT Speed Networking (Friday, October 28, 2016);
    - LCC Job Fair (Tuesday, February 21, 2017);
    - Company information sessions (LCC West);
    - Recruitment tables (LCC West).

Additional information including typical jobs for which students are hired, recent employers, etc., can be found on our web page at: http://www.lcc.edu/cit/.

Lansing Community College - Technical Careers Division
Computer Information Technologies Program

Degrees and Certificates Offered for 2016 – 2021
All curriculum guides can be viewed at:
http://www.lcc.edu/catalog/degree_certificateprograms/

CC = Certificate of Completion	< 30 semester credits required
CA = Certificate of Achievement	>= 30 semester credits and < 60 credits
AB = Associate Degree in Business	>= 60 semester credits
AAS = Associate in Applied Science Degree	>= 60 semester credits

Programs of Study Advisors and Coordinators

Applications & Foundations

Brendan Fleishans
(517) 483-1352
fleishab@lcc.edu

Advisor For
MOS Master Certification Prep CC
Information Technologies CC
Computer Support Specialist AB
Computer Technology Basics CC

Coordinator Of
Intro to Microsoft Office (CITA 110)
Microsoft Windows (CITF 108)
IT Ethics (CITF 140)

Daniel Rafail
(517) 483-1598
rafaild@lcc.edu

Advisor For
Computer Support Specialist AB
Computer Technology Basics CC
MOS Master Certification Prep
Information Technologies CC

Coordinator Of
Microsoft Access (CITA 133)
Intro to Computer Information Systems (CITF 110)

Networking

Cameron Dean
(517) 483-5290
deanc2@lcc.edu

Advisor For
Network & Cybersecurity AB
Cisco Certified Network Associate Cert Prep CC
Information Technologies Foundations CC
Convergence Technology CA

Coordinator Of
Networking Concepts (CITN 120)
Cisco Networking Academy (CITN 220, 225, 240, 245)
IT Security Foundations (CITN 280)

Joseph Werner
(517) 483-1520
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Advisor For
Network & Cybersecurity AB
Cisco Certified Network Associate Cert Prep CC
Information Technologies Foundations CC
Convergence Technology CA

Coordinator Of
Cisco Networking Academy (CITN 220, 225, 240, 245)
Securing Network Devices (CITN 244)
IT Security Foundations (CITN 280)

Programming

Melissa Hallock
(517) 483-5207
hallockm@lcc.edu

Coordinator Of
C#.Net (CITP 180, 280)
Software Testing (CITP 140, 240)

James McAvoy
(517) 483-1376
mcavoyj@lcc.edu

Advisor For
Computer Programmer/Analyst AB
Computer Programmer/Analyst CC
Computer Software Tester CA
Mobile Application Developer CC

Coordinator Of
Intro to Programming (CITP 110)
Programming Internships (CITP 295)

Tedd Sperling
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sperlt@lcc.edu

Coordinator Of
Mobile Applications
(CITP 130, 230, 235)
PHP Web Development (CITW 185)

Computer Repair & Support

Jason Mitchell
(517) 483-1553
mitch24@lcc.edu

Advisor For
Computer Repair & Support Tech AAS
Computer Repair Technician CA
Convergence Technology CA

Coordinator Of
Wireless Networking & Security (CITN 222)
CompTIA A+ Certification (CITS 125)
CompTIA Network+ Certification (CITS 225)

Brian Nelson
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nelsonb@lcc.edu

Advisor For
Convergence Technology CA
Residential Networking Specialist CC
Residential Networking Specialist CA
Computer Repair & Support Tech AAS
Computer Repair Technician CA

Coordinator Of
Home Technology Integration (CITN 115)
CompTIA A+ Certification (CITS 125)
Support Internships (CITS 285)

George Nicolopoulos
(517) 483-1597
nicolopg@lcc.edu

Coordinator Of
Computer Support
Hardware Skills (CITS 143)

Web Design & Development

Rebecca Lawson
(517) 483-1552
lawsonr@lcc.edu

Advisor For
E-Business AB
Web Site Developer CC

Coordinator Of
Internet Basics (CITF 103)
Internet Literacy (CITW 150)

Dennis Pipper
(517) 483-1558
pipperd@lcc.edu

Advisor For
E-Business AB
Web Site Developer CC
Mobile Application Developer CC

Coordinator Of
Web Site Design, Development & Management
(CITW 160, 165, 175)
ASP.NET Web Development (CITW 180)

Geographic Information Systems

Rebecca Rogers
(517) 267-5800 ext. 7026
boehmr@lcc.edu

Advisor For
GIS/Geospatial Technologies AAS
Geographic Information Systems CA

Coordinator Of
Cartography (GRET 240)
GIS Project Management (GRET 275)

CIT Administration & Program Support Staff

Eduardo "Ed" Suniga
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Computer Information Technologies,
Program Innovation
& Digital Innovation Institute
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Technical Careers/E-Pathways Program
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MAT^2 Program Coordinator
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Wyn Wilson
IT Apprenticeship Coach
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To contact coordinators for classes not listed above, please contact the program office at 517-267-6406.

Residential Networking Specialist
Certificate of Achievement
Curriculum Code: 1751 (Effective Fall 2016 – Summer 2021)

Virtually all technologies in the home are becoming part of the home network, and networking is quickly becoming the most critical skill in the home entertainment industry. In order to provide a network system that meets the increasing speed and reliability requirements, the Residential Networking Specialist must be able to design, install, configure, and maintain a high quality, complex network. Content includes networking infrastructure, testing and troubleshooting, residential construction basics, and industry best practices. This curriculum provides extensive hands-on training and prepares students for the workforce and for professional certification exams from CEDIA, CWNP, CompTIA, and others.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/networking/) or Academic Advising Department, Gannon Building – StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 30 CREDITS**

CODE	TITLE	CREDIT HOURS
BLDT 120	Structural Framing	4
CITN 115	Home Technology Integration	5
CITN 222	Wireless Networking & Security	3
CITS 125	Computer Support A+ Cert Prep	6
CITS 170	Basic Electronic for PC Repair	6
CITS 225	Networking for PC Technicians	4
DCTM 102	Industrial/Construction Safety (See Note 2)	2
	MINIMUM TOTAL	**30**

NOTES:

1. A minimum 2.0 grade in each course is required for this certificate.
2. Students who have already completed HVAC 102, METS 102, or WELD 102 with a grade of 2.0 or higher may substitute one of these courses for DCTM 102.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II
BLDT 120	CITN 115
CITS 125	CITN 222
CITS 170	CITS 225
DCTM 102	

Convergence Technology
Certificate of Achievement
Curriculum Code: 1713 (Effective Fall 2016 – Summer 2021)

Description The Convergence Technology curriculum prepares students for a career in the field of Convergence Technologies. CT is the blending or integration of voice, video, image, and data into a single but flexible global communications network and can be found in both the enterprise and residential markets. This curriculum provides extensive hands-on training and prepares students for the workforce and for professional certification exams from Cisco, CompTIA and others.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/networking/) or Academic Advising Department, Gannon Building – StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 42 CREDITS**

CODE	TITLE	CREDIT HOURS
BUSN 118	Introduction to Business	3
CITF 110	Intro to Computer Info Systems	3
CITF 120	Operating Systems Concepts	3
CITF 140	Information Technology Ethics	3
CITN 115	Home Technology Integration	5
CITN 120	Networking Concepts	3
CITN 220	Introduction to Networks (See Note 2)	3
CITN 222	Wireless Networking & Security	3
CITN 225	Routing & Switching Essentials	3
CITN 228	VoIP Fundamentals	3
CITP 110	Intro to Computer Programming	4
CITS 125	Computer Support: A+ Cert Prep	6
	MINIMUM TOTAL	**42**

NOTES:

1. Some courses are delivered in an accelerated 8 week format. Please see a Program Advisor for determination for start dates for these courses.
2. Students in this curriculum will be allowed to waive the prerequisite for CITN 220 based on documented proof of A+ certification. Contact the Computer Information Technologies Program for more information.
3. A minimum 2.0 grade in each course is required for this certificate.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II	III
CITF 110	CITN 115	BUSN 118
CITF 120	CITN 120	CITF 140
CITP 110	CITN 220	CITN 222
CITS 125	CITN 225	CITN 228

Cisco Certified Network Associate Certification Preparation (CCNA)
Certificate of Completion
Curriculum Code: 1469 (Effective Fall 2016 – Summer 2021)

The Cisco Certified Network Associate Certification Preparation (CCNA) curriculum prepares students for the CCNA certification exam. CCNA is the industry standard foundational certification for networking careers. This curriculum provides a highly concentrated training experience in computer networking and is designed for retraining and professional development. Students completing this certificate may use the credits towards the Computer Networking and Cybersecurity Associate in Business Degree (1453).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/networking/) or Academic Advising Department, Gannon Building – StarZone, telephone number (517) 483-1904.

REQUIREMENTS (See Note 1)		**TOTAL: 12 CREDITS**
CODE	TITLE	CREDIT HOURS
CITN 220	Introduction to Networks (See Note 2)	3
CITN 225	Routing & Switching Essentials	3
CITN 240	Scaling Networks	3
CITN 245	Connecting Networks	3
LIMITED CHOICE REQUIREMENTS		**TOTAL: 6 CREDITS**
Complete the indicated number of credits from **EACH CHOICE** listed below.		
CHOICE 1: Additional Courses (See Note 3)		**6 Credits**
CITN 120	Networking Concepts	3
CITN 222	Wireless Networking & Security (See Note 2)	3
CITN 228	VoIP Fundamentals	3
CITN 244	Securing Networking Devices	3
CITN 295	CCNA Review	3
CITS 125	Computer Support: A+ Cert Prep	6
	MINIMUM TOTAL	**18**

NOTES:

1. Courses are delivered in an accelerated 8 week format. Please see a Program Advisor for determination of start dates for these courses.
2. Students in this curriculum will be allowed to waive the prerequisites for CITN 220 and CITN 222 based on documented proof of A+ certification. Contact the Computer Information Technologies Program.
3. Other CIT_ prefix courses may be approved for a Limited Choice by a Computer Information Technology Academic Program Advisor.
4. A minimum 2.0 grade in each course is required for this certificate.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**
CITN 220	CITN 240
CITN 225	CITN 245
Lim. Ch.	Lim. Ch.

Computer Networking and Cybersecurity
Associate in Business Degree
Curriculum Code: 1453 (Effective Fall 2016 – Summer 2021)

Networking technology binds computers and connects people with information and information security seeks to protect this information. Students learn to design, create, and administer efficient information technology networks of data, voice, image, and video communications. Students learn to provide the technical management and support to keep systems running 24/7, and to safeguard the data they control. This degree focuses on technical competencies as well as communication with users, management, and project planning skills. Students will be prepared to earn several industry respected certifications. Students completing this curriculum may also be eligible to apply for certificates of completion in Cisco Certified Network Associate Certification Preparation (CCNA) (1469) and in Information Technology Foundations (0766). **Not all courses in this program transfer to all colleges.** Students planning to transfer should see an academic advisor before enrolling in any course.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/networking/) or Academic Advising Department, Gannon Building – StarZone, telephone number (517) 483-1904.

REQUIREMENTS (See Note 1) **TOTAL: 43 CREDITS**

CODE	TITLE	CREDIT HOURS
BUSN118	Introduction to Business	3
CITF 110	Intro Computer Info Systems	3
CITF 120	Operating Systems Concepts	3
CITF 140	Information Technology Ethics	3
CITF 240	IT Project Management	3
CITN 120	Networking Concepts	3
CITN 220	Introduction to Networks	3
CITN 225	Routing & Switching Essentials	3
CITN 230	Linux/UNIX Operating System	3
CITN 250	Microsoft Network Server	3
CITN 280	IT Security Foundations	3
CITP 110	Intro to Computer Programming	4
CITS 125	Computer Support: A+ Cert Prep	6

LIMITED CHOICE REQUIREMENTS **TOTAL: 22-28 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: General Education Core Areas **13-18 Credits**

(See *General Education Core Requirements* for information on how to fulfill these requirements. Core area proficiency exams, where appropriate, are available for each core area.)

	Communication Core Area (See Note 2)	3-4
	Global Perspectives and Diversity Core Area	3-4
	Mathematics Core Area	3-5
	Science Core Area	4-5
	Writing Core Area (See Note 3)	0

CHOICE 1A: Writing **3-4 Credits**

WRIT 121	Composition I	4
WRIT 127	Business Writing	3

CHOICE 2: Computer Related (See Note 4) **6 Credits**

CITN 222	Wireless Networking & Security	3
CITN 228	VoIP Fundamentals	3
CITN 240	Scaling Networks	3
CITN 244	Securing Networking Devices	3
CITN 245	Connecting Networks	3
CITN 295	CCNA Review	3

CITS 285	IT Professional Internship	3
	MINIMUM TOTAL	**65**

NOTES:

1. Some CIT_ courses are delivered in an accelerated 8 week format. Please see a Program Advisor for schedule options.
2. SPCH 110 is recommended for the Communication Core area.
3. Students must complete one course from CHOICE 1A to fulfill the requirements for the Writing Core area.
4. Other CITN courses may be approved for CHOICE 2 by a Computer Information Technologies Academic advisor.
5. For graduation from this program, a student must earn a minimum 2.0 grade in all courses.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**	**III**	**IV**
CITF 110	CITF 240	BUSN 118	CITN 230
CITF 140	CITN 220	CITF 120	Lim.Ch.1
CITN 120	CITN 225		Lim.Ch.1
CITS 125	CITP 110		Lim.Ch.2
Lim.Ch.1	Lim.Ch.1A		

V
CITN 250
CITN 280
Lim.Ch.1
Lim.Ch.2

Mobile Application Developer
Certificate of Achievement
Curriculum Code: 1712 (Effective Fall 2016 – Summer 2021)

This certificate provides students with an understanding of mobile applications (apps) and how these applications are utilized and integrated to meet specific business needs. The coursework builds a solid foundation of software development skills and introduces the specific skills needed for developing mobile applications. Students will also develop skills in the design of Android and iOS software systems, using appropriate technologies, architectures and techniques. This course work may be applied toward completion of the Computer Programmer/Analyst, Associate in Business Degree (0113).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/programming/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS (See Note 1)		**TOTAL: 17 CREDITS**
CODE	TITLE	CREDIT HOURS
CITP 110	Intro to Computer Programming	4
CITP 130	Intro to Mobile Application Devel	3
CITP 230	Mobile App Devel for Android	4
CITW 150	Internet Literacy	3
CITW 160	Web Site Dsgn & Development I	3
LIMITED CHOICE REQUIREMENTS		**TOTAL: 13 CREDITS**
Complete the indicated number of credits from **EACH CHOICE** listed below.		
CHOICE 1: Business and Computer Related (See Note 1)		**13 Credits**
Business Related		
ARTS 102	Design and Communication	3
WRIT 124	Technical Writing	3
Computer Related		
CITD 120	SQL Concepts	2
CITF 140	Information Technology Ethics	3
CITP 140	Software Testing	3
CITP 150	Intro to VB.NET Programming	4
CITP 180	Intro C#.NET Programming	4
CITP 190	Intro to Programming in JAVA	4
CITP 220	Game Design & Development	2
CITP 229	Special Topics in Programming (See Note 2)	.25-6
CITP 235	Mobile App Devel for Apple	4
CITW 165	Web Site Dsgn & Development II	3
CITW 185	PHP Web Development	4
CITW 227	Web Independent Study (See Note 2)	.25-4
CITW 229	Special Topics/Web (See Note 2)	.25-6
	MINIMUM TOTAL	**30**

NOTES:

1. Prerequisite may be waived based on experience. See a Computer Information Technologies program advisor prior to registration for more information.
2. Contact a Computer Information Technologies program advisor for topics that will apply toward this curriculum.
3. Students must complete each CIT_ course with a minimum grade of 2.0 to receive this certificate of achievement.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II	III
CITP 110	CITP 130	CITP 230
CITW 150	CITW 160	Lim. Ch.
Lim. Ch.	Lim. Ch.	Lim. Ch.

Computer Software Tester
Certificate of Achievement
Curriculum Code: 1633 (Effective Fall 2016 – Summer 2021)

Software Testing, or Software Quality Assurance, is one of many essential jobs in the computing industry. Companies need people to create software programs or applications as well as professionals to discover defects in these applications. Software testers must be knowledgeable about computers and their usage to meet the goals of the organization. They are familiar with programming and how software is put together. Knowledge of testing principles, such as test planning, test case design and implementation, test documentation, and the use of automated testing software are necessary. Soft skills are also essential to work effectively as a member of an organizational team. Students completing this certificate may use the credits towards the Computer Programmer/Analyst Associate in Business Degree (0113).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/programming/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 26 CREDITS**

CODE	TITLE	CREDIT HOURS
CITF 110	Intro Computer Info Systems	3
CITF 240	IT Project Management	3
CITF 260	Systems Analysis and Design	4
CITP 110	Intro to Computer Programming	4
CITP 140	Software Testing	3
CITP 240	Advanced Software Testing	3
CITW 150	Internet Literacy	3
SPCH 110	Oral Comm in the Workplace	3

LIMITED CHOICE REQUIREMENTS **TOTAL: 7 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: Writing		**3 Credits**
WRIT 124	Technical Writing	3
WRIT 127	Business Writing	3
CHOICE 2: Programming		**4 Credits**
CITP 150	Intro to VB.Net Programming	4
CITP 180	Intro to C#.Net Programming	4
CITP 190	Intro to Programming in Java	4
	MINIMUM TOTAL	**33**

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II
CITF 110	CITF 240
CITP 110	CITF 260
CITP 140	CITP 240
SPCH 110	CITW 150
Lim.Ch.1	Lim.Ch.2

Computer Programmer/Analyst
Certificate of Completion
Curriculum Code: 0969 (Effective Fall 2016 - Summer 2021)

This certificate provides a starting point for students interested in pursuing the Computer Programmer/Analyst Associate Degree, (0113). It is designed for students who already have basic computer skills.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/programming/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 15 CREDITS**

CODE	TITLE	CREDIT HOURS
BUSN 118	Introduction to Business	3
CITD 120	SQL Concepts	2
CITF 110	Intro Computer Info Systems	3
CITP 110	Intro to Computer Programming	4
CITW 150	Internet Literacy	3

LIMITED CHOICE REQUIREMENTS **TOTAL: 4 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: Computer Related		**4 Credits**
CITP 150	Intro to VB.NET Programming	4
CITP 180	Intro to C#.NET Programming	4
CITP 190	Intro to Programming in JAVA	4
	MINIMUM TOTAL	**19**

NOTE:

1. Students must complete each course with a minimum grade of 2.0 to receive this certificate of completion.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II
BUSN 118	CITD 120
CITF 110	CITW 150
CITP 110	Lim.Ch.

Computer Programmer/Analyst
Associate in Business Degree
Curriculum Code: 0113 (Effective Fall 2016 - Summer 2021)

Programmer/analysts plan, develop, test, and document computer programs at the request of a specific user, applying knowledge of programming, project management, testing, and quality assurance techniques and computer systems. They may evaluate user requests to determine feasibility, cost, and time required, as well as compatibility with current system and computer capabilities. In addition, they read manuals, periodicals, and technical reports to develop programs that meet user requirements and to remain current with developments and standards in the information technology industry. They formulate a plan outlining steps required to develop programs and convert project specifications into program source instructions which are entered into the computer system and tested. They may write documentation and the user manual. Students completing this curriculum may also be eligible for a Certificate of Completion for Computer Programmer/Analyst (0969), Certificate of Achievement for Computer Software Tester (1633), and a Certificate of Achievement for Mobile Application Developer (1712). **Not all courses in this program transfer to all colleges.** Students planning to transfer should see an academic advisor before enrolling in any course.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/programming/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 35 CREDITS**

CODE	TITLE	CREDIT HOURS
BUSN 118	Introduction to Business	3
CITD 120	SQL Concepts	2
CITF 110	Intro Computer Info Systems	3
CITF 240	IT Project Management	3
CITF 260	Systems Analysis and Design	4
CITP 110	Intro to Computer Programming	4
CITP 130	Intro to Mobile App Devel	3
CITP 140	Software Testing	3
CITP 190	Intro to Programming in JAVA	4
CITW 150	Internet Literacy	3
CITW 160	Web Site Dsgn & Development I	3
LIMITED CHOICE REQUIREMENTS		**TOTAL: 30-36 CREDITS**
Complete the indicated number of credits from **EACH CHOICE** listed below.		
CHOICE 1: General Education Core Areas		**16-22 Credits**
(See *General Education Core Requirements* for information on how to fulfill these requirements. Core area proficiency exams, where appropriate, are available for each core area.)		
	Communication Core Area	3-4
	Global Perspectives and Diversity Core Area	3-4
	Mathematics Core Area	3-5
	Science Core Area	4-5
	Writing Core Area	3-4
CHOICE 2: Intro Programming (Choose one)		**4 Credits**
CITP 150	Intro to VB.NET Programming	4
CITP 180	Intro to C#.NET Programming	4
CHOICE 3: Advanced Programming (Choose one)		**4 Credits**
CITP 230	Mobile App Devel for Android	4
CITP 235	Mobile App Devel for Apple	4
CITP 250	Advanced VB.NET Programming	4
CITP 280	Advanced C#.NET Programming	4
CITP 290	Adv JAVA Programming for Busn	4

CHOICE 4: Additional Computer Classes (See Note 1)		**6 Credits**
CITD 250	Database Concepts	3
CITF 140	Information Technology Ethics	3
CITN 120	Networking Concepts	3
CITP 229	Special Topics in Programming	.25-6
CITP 220	Game Design & Development	2
CITP 240	Advanced Software Testing	3
CITP 295	Programming Internship	3
CITW 165	Web Site Dsgn & Development II	3
CITW 180	ASP.NET Web Development	4
CITW 185	PHP Web Development	4
	MINIMUM TOTAL	**65**

NOTES:

1. Additional course from "CHOICE 2" and/or "CHOICE 3" may be used for "CHOICE 4".
2. For graduation from this program, a student must have earned a minimum 2.0 grade in each course with a CIT_ prefix.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**	**III**	**IV**
BUSN 118	CITD 120	CITF 240	CITF 260
CITF 110	CITP 130	CITP 140	Lim.Ch.1
CITP 110	CITW 160	CITP 190	Lim.Ch.1
CITW 150	Lim.Ch.1	Lim.Ch.1	Lim.Ch.3
Lim.Ch.1	Lim.Ch.2	Lim.Ch.4	Lim.Ch.4

Web Site Developer
Certificate of Completion
Curriculum Code: 0843 (Effective Fall 2016 – Summer 2021)

This certificate provides students with the technical skills necessary to use the Internet as an effective business resource, including building and maintaining commercial web-sites. It is designed for students who already have basic computer skills and want to specialize in Internet technology and web site design and development. This course work can be applied toward completion of the E-Business, Associate in Business Degree (0839).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/web/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS (See Note 1) **TOTAL: 12 CREDITS**

CODE	TITLE	CREDIT HOURS
CITW 150	Internet Literacy	3
CITW 160	Web Site Dsgn & Development I	3
CITW 165	Web Site Dsgn & Development II	3
CITW 175	Web Site Management	3

LIMITED CHOICE REQUIREMENTS **TOTAL: 4-6 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: Design and Development Related		**4-6 Credits**
ARTS 102	Design & Communication	3
CITP 110	Intro to Computer Programming	4
CITP 130	Intro to Mobile App Devel	3
CITW 185	PHP Web Development	4
	MINIMUM TOTAL	**16**

NOTES:

1. Prerequisites may be waived based on experience. See a Computer Information Technologies program advisor prior to registration for more information.
2. Students must complete each course with a minimum grade of 2.0 to receive this certificate of completion.
3. This curriculum may be completed online via the Internet.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**
CITW 150	CITW 165
CITW 160	CITW 175
Lim.Ch.1	Lim.Ch.1

E-Business
Certificate of Achievement
Curriculum Code: 0845 (Effective Fall 2016 – Summer 2021)

This certificate provides students with the opportunity to develop technical and marketing knowledge necessary to use the Internet as a business tool. Students will learn how to use business, marketing, and web related resources. This certificate can be completed entirely online. All of the course work in this certificate may be applied toward the E-Business, Associate in Business Degree (0839).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/web/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS (See Note 1)		**TOTAL: 21 CREDITS**
CODE	TITLE	CREDIT HOURS
BUSN 118	Introduction to Business	3
CITW 150	Internet Literacy	3
CITW 160	Web Site Dsgn & Development I	3
CITW 175	Web Site Management	3
MKTG 120	Sales	3
MKTG 200	Principles of Marketing	3
MKTG 210	Marketing on the Internet	3
LIMITED CHOICE REQUIREMENTS (See Note 1)		**TOTAL: 11 CREDITS**
Complete the indicated number of credits from **EACH CHOICE** listed below.		
CHOICE 1: Design and Development Related		**5 Credits**
ARTS 102	Design & Communication	3
CITF 140	Information Technology Ethics	3
CITP 110	Intro to Computer Programming	4
CITP 130	Intro to Mobile App Devel	3
CITP 150	Intro to VB.NET Programming	4
CITP 220	Game Design and Development	2
CITW 165	Web Site Dsgn & Development II	3
CITW 180	ASP.NET Web Development	4
CITW 185	PHP Web Development	4
CITW 229	Special Topics/Web	1-2
CHOICE 2: Business Related		**6 Credits**
BUSN 160	Starting a Business	4
BUSN 161	Writing a Business Plan	2
MGMT 200	Creative Thinking for Business	3
MKTG 119	Mktg/Manage Your Profess Image	3
MKTG 221	Consumer Behavior	2
MKTG 229	Public Relations	2
WRIT 124	Technical Writing	3
	MINIMUM TOTAL	**32**

NOTES:

1. Prerequisites may be waived based on experience. See a Computer Information Technologies program advisor prior to registration for more information.
2. Students must complete each CIT_ course with a minimum grade of 2.0 to receive this certificate of achievement.
3. This curriculum may be completed online via the internet.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II
BUSN 118	CITW 175
CITW 150	MKTG 120
CITW 160	MKTG 210
MKTG 200	Lim. Ch.
Lim. Ch.	Lim. Ch.
	Lim. Ch.

E-Business
Associate in Business Degree
Curriculum Code: 0839 (Effective Fall 2016 – Summer 2021)

E-business is the use of Internet technology to conduct business transactions. Students will learn to apply technical and behavioral skills to the various progressive possibilities of e-business as it relates to current business practices. This degree can be completed entirely online. Graduates are prepared to work in a variety of manufacturing, wholesaling, and retailing environments, or government environment. Students completing this curriculum may also be eligible to apply for a certificate in E-Business (0845). **Not all courses in the program transfer to all colleges.** Students planning to transfer should see an academic advisor before enrolling in any course.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/web/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 38 CREDITS**

CODE	TITLE	CREDIT HOURS
ARTS 102	Design & Communication	3
BUSN 118	Introduction to Business	3
CITP 110	Intro to Computer Programming	4
CITW 150	Internet Literacy	3
CITW 160	Web Site Dsgn & Development I	3
CITW 175	Web Site Management	3
CITW 185	PHP Web Development	4
MGMT 234	Diversity in the Workplace	3
MKTG 119	Mktg/Manage Your Profess Image	3
MKTG 200	Principles of Marketing	3
MKTG 210	Marketing on the Internet	3
WRIT 124	Technical Writing	3

LIMITED CHOICE REQUIREMENTS **TOTAL: 24-27 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: General Education Core Areas **7-10 Credits**

(See *General Education Core Requirements* for information on how to fulfill these requirements. Core area proficiency exams, where appropriate, are available for each core area.)

	Communication Core Area (See Note 1)	0
	Global Perspectives and Diversity Core Area (See Note 1)	0
	Mathematics Core Area	3-5
	Science Core Area	4-5
	Writing Core Area (See Note 1)	0

CHOICE 2: Business Related **8 Credits**

ACCG 210	Principles of Accounting I	4
BUSN 160	Starting a Business	4
BUSN 161	Writing a Business Plan	2
ECON 201	Principles of Economics-Micro	4
MGMT 150	Managing Customer Relations	3
MGMT 200	Creative Thinking for Business	3
MKTG 120	Sales	3
MKTG 130	Retailing	3
MKTG 140	Introduction to Advertising	3
MKTG 202	Managerial Marketing	3
MKTG 204	Marketing Research	3
MKTG 221	Consumer Behavior	2
MKTG 229	Public Relations	2

CHOICE 3: Design and Development Related		**9 Credits**
CITD 120	SQL Concepts	2
CITF 140	Information Technology Ethics	3
CITP 130	Intro to Mobile App Devel	3
CITP 150	Intro to VB.NET Programming	4
CITP 190	Intro to Programming in JAVA	4
CITP 220	Game Design and Development	2
CITW 165	Web Site Dsgn & Development II	3
CITW 180	ASP.NET Web Development	4
CITW 229	Special Topics/Web	1-2
	MINIMUM TOTAL	**62**

NOTE:

1. Students completing "REQUIREMENTS" have fulfilled the requirements for this Core area.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**	**III**	**IV**
ARTS 102	CITW 175	CITW 185	MGMT 234
BUSN 118	MKTG 200	MKTG 119	Lim.Ch.
CITP 110	MKTG 210	WRIT 124	Lim.Ch.
CITW 150	Lim.Ch.	Lim.Ch.	Lim.Ch.
CITW 160	Lim.Ch.	Lim.Ch.	Lim.Ch.

Computer Repair Technician
Certificate of Achievement
Curriculum Code: 0168 (Effective Fall 2016 - Summer 2021)

This certificate provides technical knowledge and skills to repair and service computers, test computers and computer components, and diagnose causes of malfunctions. Individuals are prepared for entry-level positions. This certificate will be able to be used toward the Computer Repair and Support Technician, Associate in Applied Science Degree (0743).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/support/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS		**TOTAL: 27 CREDITS**
CODE	TITLE	CREDIT HOURS
CITS 125	Computer Support A+ Cert Prep	6
CITS 143	Hardware Support Skills	4
CITS 160	Logic Problems Analysis	3
CITS 170	Basic Electronic for PC Repair	6
CITS 176	PC Hardware Troubleshooting	6
CITS 181	Computer Diagnostic Software	2
LIMITED CHOICE REQUIREMENTS		**TOTAL: 3 CREDITS**
Complete the indicated number of credits from **EACH CHOICE** listed below.		
CHOICE 1: Communication		**3 Credits**
SPCH 110	Oral Comm in the Workplace	3
WRIT 124	Technical Writing	3
	MINIMUM TOTAL	**30**

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**
CITS 143	CITS 125
CITS 160	CITS 176
CITS 170	CITS 181
Lim. Ch.	

Computer Repair and Support Technician
Associate in Applied Science Degree
Curriculum Code: 0743 (Effective Fall 2016 – Summer 2021)

A computer service technician is highly knowledgeable in both computer hardware and software. This person must not only understand the operation of the computer system, but must also diagnose and repair the system when it fails, make upgrades, and perform preventive maintenance. A computer service technician also answers customers' questions relating to correct use of computers or components and may install new equipment. A successful computer service technician must understand electronics, computer hardware and software, and how they work together to make the computer operate. Computer service technicians are employed in computer sales and service shops and any place a large number of computers are found. Students completing this curriculum may also be eligible to apply for a Certificate of Achievement for Computer Repair Technician (0168). **Not all courses in this program transfer to all colleges.** Students planning to transfer should see an academic advisor before enrolling in any course.

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/support/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 46 CREDITS**

CODE	TITLE	CREDIT HOURS
CITN 115	Home Technology Integration	5
CITN 222	Wireless Networking & Security	3
CITP 110	Intro to Computer Programming	4
CITS 125	Computer Support: A+ Cert Prep	6
CITS 143	Hardware Support Skills	4
CITS 160	Logic Problems Analysis	3
CITS 170	Basic Electronic for PC Repair	6
CITS 176	PC Hardware Troubleshooting	6
CITS 181	Computer Diagnostic Software	2
CITS 225	Networking for PC Technicians	4
CITS 285	IT Professional Internship (See Note 1)	3

LIMITED CHOICE REQUIREMENTS **TOTAL: 16-22 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: General Education Core Areas **16-22 Credits**

(See *General Education Core Requirements* for information on how to fulfill these requirements. Core area proficiency exams, where appropriate, are available for each core area.)

Communication Core Area	3-4
Global Perspectives and Diversity Core Area	3-4
Mathematics Core Area	3-5
Science Core Area	4-5
Writing Core Area	3-4
MINIMUM TOTAL	**62**

NOTES:

1. Students with appropriate IT work experience may be able to substitute another CIT_ course. Please see a Computer Information Technologies program advisor.
2. Students interested in specializing in computer software support should review the curriculum guide for Computer Support Specialist, #0713.
3. For graduation from this program, a student must have earned a minimum 2.0 grade in each course with a CIT_ prefix and in all Core courses.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II	III	IV
CITS 143	CITS 125	CITN 115	CITN 222
CITS 160	CITS 176	CITS 225	CITP 110
CITS 170	CITS 181	Lim.Ch.	CITS 285
Lim. Ch.	Lim. Ch.	Lim.Ch.	Lim. Ch.

Microsoft Office Specialist
Certificate of Completion
Curriculum Code: 0841 (Effective Fall 2016 - Summer 2021)

Completion of this certificate demonstrates competency in Microsoft Office programs and prepare students for the optional Microsoft Certified Applications Specialist (MCAS) exams. The Microsoft certification credential is a globally recognized standard demonstrating software skills widely used in current office environments. Preparation is included for MCAS exams for Word, Excel, Access, PowerPoint and Outlook. Students completing this certificate may use the credits towards the Computer Support Specialist, Associate in Business Degree (0713).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/applications/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 21 CREDITS**

CODE	TITLE	CREDIT HOURS
CITA 115	Microsoft PowerPoint	3
CITA 119	Microsoft Word	3
CITA 126	Microsoft Excel	3
CITA 133	Microsoft Access Database	3
CITA 140	Microsoft Outlook	3
CITA 219	Advanced Microsoft Word	3
CITA 226	Microsoft Excel–Advanced	3
	MINIMUM TOTAL	**21**

NOTE:

1. Students must complete these courses with a minimum grade of 2.0 to receive this certificate of completion.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor or counselor for help with adjustments.

I	II
CITA 115	CITA 140
CITA 119	CITA 219
CITA 126	CITA 226
CITA 133	

Computer Support Specialist
Associate in Business Degree
Curriculum Code: 0713 (Effective Fall 2016 - Summer 2021)

Computer support specialists install, modify and make minor repairs to computer hardware and software systems and provide technical assistance and training to system users. They install or assist service personnel in installation of hardware and peripheral components, such as monitors, keyboards, printers, and disk drives on user's premises, following design or installation specifications. They may also load software packages into the computer; instruct users in use of equipment, software, and manuals; answer clients' inquiries concerning the systems operation; and diagnose system hardware, software, and operator problems. Students completing this curriculum may also be eligible to apply for certificates of completion in Microsoft Office Specialist (0841) and Computer Technology Basics (0844).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/support/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 42 CREDITS**

CODE	TITLE	CREDIT HOURS
BUSN 118	Introduction to Business	3
CITA 115	Microsoft PowerPoint	3
CITA 119	Microsoft Word	3
CITA 126	Microsoft Excel	3
CITA 133	Microsoft Access Database	3
CITF 108	Microsoft Windows	2
CITF 110	Intro Computer Info Systems	3
CITF 140	Information Technology Ethics	3
CITN 120	Networking Concepts	3
CITP 110	Intro to Computer Programming	4
CITS 125	Computer Support: A+ Cert Prep	6
CITS 285	IT Professional Internship (See Note 1)	3
CITW 150	Internet Literacy	3

LIMITED CHOICE REQUIREMENTS **TOTAL: 22-30 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: General Education Core Areas **16-22 Credits**

(See *General Education Core Requirements* for information on how to fulfill these requirements. Core area proficiency exams, where appropriate, are available for each core area.)

	Communication Core Area	3-4
	Global Perspectives and Diversity Core Area	3-4
	Mathematics Core Area	3-5
	Science Core Area	4-5
	Writing Core Area	3-4

CHOICE 2: Computer Related (See Note 2) **6-8 Credits**

CITA 140	Microsoft Outlook	3
CITA 219	Advanced Microsoft Word	3
CITA 226	Microsoft Excel–Advanced	3
CITA 233	Advanced Microsoft Access	2
CITD 250	Database Concepts	3
CITF 260	Systems Analysis and Design	4
CITN 250	Microsoft Network Server	3
CITN 280	IT Security Foundations	3
CITS 225	Networking for PC Technicians	4
CITW 160	Web Site Dsgn & Development I	3

MINIMUM TOTAL **64**

NOTES:

1. Students with appropriate IT work experience may be able to substitute another CIT course. Please see a Computer Information Technologies program advisor.
2. Other CIT_ prefix courses may be approved for "CHOICE 2" by a Computer Information Technology program advisor.
3. For graduation from this program, a student must have earned a minimum 2.0 grade in each course with a CIT_ prefix.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II	III	IV
CITA 115	CITA 119	CITF 140	BUSN 118
CITA 126	CITA 133	CITS 125	CITS 285
CITF 108	CITN 120	Lim.Ch.1	Lim.Ch.1
CITF 110	CITP 110	Lim.Ch.1	Lim.Ch.2
CITW 150	Lim.Ch.1		Lim.Ch.2
Lim.Ch.1			

Information Technology Foundations
Certificate of Completion
Curriculum Code: 0766 (Effective Fall 2016 – Summer 2021)

This certificate of completion provides the student with a broad-based introduction to the Information Technology (IT) field. The courses are selected to give the student an understanding of the use of computers in various aspects of business, some typical business applications, how computer networks function, how operating systems work, and an introduction to computer programming. Students also learn skills for basic computer repair and support, allowing them to earn the industry respected CompTIA A+ certification. This certificate is especially suited to help an undecided student select which aspect of IT to pursue, or to allow a person with a non-IT background and/or degree to add basic IT skills, or as a starting point for students seeking the Computer Networking and Cybersecurity, Associate in Business Degree (1453).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/foundations/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS **TOTAL: 19 CREDITS**

CODE	TITLE	CREDIT HOURS
CITF 110	Intro Computer Info Systems	3
CITF 120	Operating Systems Concepts	3
CITN 120	Networking Concepts	3
CITP 110	Intro to Computer Programming	4
CITS 125	Computer Support: A+ Cert Prep	6
	MINIMUM TOTAL	**19**

NOTE:

1. A minimum 2.0 grade in each course with a CIT_ prefix is required for this certificate.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**
CITF 110	CITF 120
CITN 120	CITP 110
CITS 125	

Computer Technology Basics
Certificate of Completion
Curriculum Code: 0844 (Effective Fall 2016 - Summer 2021)

This certificate provides the basic classes for many Computer Information Technology Associate in Business degrees. Studnts will learn introductory concepts of computer usage in business. This certificate can be completed entirely online. Students completing this certificate may use the credits towards the Computer Support Specialist, Associate in Business Degree (0713).

PREREQUISITES

Students should see *Course Offerings* for course prerequisite information. See the *Assessment and Placement Testing* section for skills assessment and advising information.

INFORMATION

Contact the Computer Information Technologies Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: www.lcc.edu/cit/foundations/) or Academic Advising Department, Gannon Building - StarZone, telephone number (517) 483-1904.

REQUIREMENTS		**TOTAL: 18 CREDITS**
CODE	TITLE	CREDIT HOURS
CITF 108	Microsoft Windows	2
CITF 110	Intro Computer Info Systems	3
CITF 140	Information Technology Ethics	3
CITN 120	Networking Concepts	3
CITP 110	Intro to Computer Programming	4
CITW 150	Internet Literacy	3
LIMITED CHOICE REQUIREMENTS		**TOTAL: 3-4 CREDITS**
Complete the indicated number of credits from **EACH CHOICE** listed below.		
CHOICE 1: Writing		**3-4 Credits**
WRIT 121	Composition I	4
WRIT 124	Technical Writing	3
WRIT 127	Business Writing	3
	MINIMUM TOTAL	**21**

NOTE:

1. Students must complete each CIT_ course with a minimum grade of 2.0 to receive this certificate of completion.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	**II**
CITF 108	CITF 140
CITF 110	CITN 120
CITP 110	CITW 150
Lim.Ch.	

Geographic Information Systems
Certificate of Achievement
Curriculum Code: 0834 (Effective Fall 2016 - Summer 2021)

This certificate program will emphasize development of components for GIS and project design based on application areas. The certificate allows beginners to become familiar with basic principles and those with some application background to become computer proficient in GIS. Students completing this certificate may use the credits towards the Geographic Information Systems and Geospatial Technology Associate in Applied Science Degree (0834).

PREREQUISITES

Students should see *Course Descriptions* for course prerequisite information. See *Academic Assessment and Placement Testing for Student Success* for skills assessment and advising information.

INFORMATION

Contact the Geographical Information Systems Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: http://www.lcc.edu/cit/geographic/) or Student Services West Campus, West Campus Building, Room M106, telephone number (517) 267-5452.

REQUIREMENTS **TOTAL: 30 CREDITS**

CODE	TITLE	CREDIT HOURS
CITA 133	Microsoft Access Database	3
CIVL 101	Civil Drafting	3
GRET 100	GIS Principles & Applications	3
GRET 110	Beginning ArcGIS Desktop	3
GRET 120	Advanced ArcGIS	3
GRET 210	Global Positioning Systems	3
GRET 240	Cartography in GIS	3
GRET 241	Remote Sens/AirPhoto Interpret	3
GRET 271	Parcel Mapping	3
GRET 275	GIS Proj Mgmt & Implementation	3
	MINIMUM TOTAL	**30**

NOTE:

1. To receive a certificate of achievement from Lansing Community College, a student must maintain a grade point average of 2.0 or above in the courses required for the certificate.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II	III	IV
CIVL 101	CITA 133	GRET 120	GRET 241
GRET 100	GRET 110	GRET 271	GRET 275
GRET 210	GRET 240		

Geographic Information Systems and Geospatial Technology
Associate in Applied Science Degree
Curriculum Code: 0224 (Effective Fall 2016 - Summer 2021)

Geographic Information Systems and Geospatial Technology combines computer technology, mapping technologies, aerial photography, and satellite imagery with the most current environmental resource management and environmental analysis software. Geographic Information Systems (GIS) technicians work with computer drafting, design, database management, graphic design, and computer analysis. Environmental technology requirements include a working knowledge of natural systems and related regulations and their assessment, planning, restoration, and management. GIS technicians are employed with engineering and design firms, state and federal agencies, environmental firms, parks and recreation departments, and with municipalities and local government units. Students completing this curriculum may also be eligible to apply for the Certificate of Achievement in Geographic Information Systems (0224). **Not all courses in this program transfer to all colleges.** Students planning to transfer should see an academic advisor before enrolling in any course.

PREREQUISITES

Students should see *Course Descriptions* for course prerequisite information. See *Academic Assessment and Placement Testing for Student Success* for skills assessment and advising information.

INFORMATION

Contact the Geographical Information Systems Program, West Campus Building, Room M103, telephone number (517) 267-6406 (Website: http://www.lcc.edu/cit/geographic/) or Student Services West Campus, West Campus Building, Room M106, telephone number (517) 267-5452.

REQUIREMENTS **TOTAL: 56 CREDITS**

CODE	TITLE	CREDIT HOURS
CITA 110	Intro to Microsoft Office	3
CITA 133	Microsoft Access Database	3
CITP 110	Intro to Computer Programming	4
CIVL 101	Civil Drafting	3
GEOG 200	World Regional Geography	4
GEOL 230	Environmental Geology	4
GRET 100	GIS Principles & Applications	3
GRET 110	Beginning ArcGIS Desktop	3
GRET 120	Advanced ArcGIS	3
GRET 210	Global Positioning Systems	3
GRET 240	Cartography in GIS	3
GRET 241	Remote Sens/AirPhoto Interpret	3
GRET 260	Automating Workflows in GIS	3
GRET 271	Parcel Mapping	3
GRET 275	GIS Proj Mgmt & Implementation	3
MATH 115	Technical Math II	4
WRIT 121	Composition I	4

LIMITED CHOICE REQUIREMENTS **TOTAL: 12-14 CREDITS**

Complete the indicated number of credits from **EACH CHOICE** listed below.

CHOICE 1: General Education Core Areas **3-4 Credits**

(Click the link above for information on how to fulfill these requirements. Core area proficiency exams, where appropriate, are available for each core area.)

	Communication Core Area	3-4
	Global Perspectives and Diversity Core Area (See Note 1)	0
	Mathematics Core Area (See Note 1)	0
	Science Core Area (See Note 1)	0
	Writing Core Area (See Note 1)	0

CHOICE 2: Additional Related Courses **9-10 Credits**

CITA 126	Microsoft Excel	3
CITP 190	Intro to Programming in JAVA	4
GRET 220	Hydrological Systems	3
GRET 264	Web GIS	3

GRET 277	Advanced GIS Data Structures	3
	MINIMUM TOTAL	**68**

NOTE:

1. Students completing "REQUIREMENTS" have fulfilled the requirements for this Core area.

SUGGESTED COURSE SEQUENCE

Students should see course descriptions to find out when departments plan to offer courses. Students who for any reason are unable to follow the course sequence suggested below (for example, those who are part-time, have transferred in courses from another school, or have prerequisites to fulfill) should contact an academic advisor for help with adjustments.

I	II	III	IV
CITA 110	GEOL 230	CITP 110	GRET 241
CITA 133	GRET 110	GEOG 200	GRET 260
CIVL 101	GRET 240	GRET 120	GRET 275
GRET 100	MATH 115	GRET 271	Lim.Ch.1
GRET 210	WRIT 121	Lim.Ch.2	Lim.Ch.2
		Lim.Ch.2	

Computer Information Technologies Course Descriptions

CITA 110 - Intro to Microsoft Office
This course provides an introduction to MS Office. It is designed to develop basic operational proficiency while using Microsoft Office (Word, Excel, Access and Powerpoint). Students learn how to use word processing, spreadsheet, database, and presentation software. Topics include creating business letters, business memos, elementary spreadsheets, elementary database structures, and slide presentations. (F, Sp, Su)
Prerequisite: Reading Level 4
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 115 - Microsoft PowerPoint
This course introduces students to the fundamental features of Microsoft PowerPoint. Topics include creating presentations using themes, graphic elements, interactive elements and animation effects. Students will prepare presentations for distribution in a variety of formats. (F, Sp, Su)
Prerequisite: Reading Level 4
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 119 - Microsoft Word
This course introduces students to the fundamental features of Microsoft Word. Major topics include formatting text; creating footnotes, lists, tables, columns, newsletters and charts; inserting graphics; and exposure to mail merge. (F, Sp, Su)
Prerequisite: Reading Level 4
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 126 - Microsoft Excel
This course provides introductory through intermediate level training in Excel spreadsheets. Instruction includes creating worksheets and charts, using formulas and functions, creating Subtotal and PivotTable reports, and working with multiple worksheets. (F, Sp, Su)
Prerequisite: Reading Level 5
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 133 - Microsoft Access Database
This course provides introductory through intermediate level training in the creation of database management systems using Microsoft Access. Instruction includes an introduction to Microsoft Access, database creation and maintenance, database querying, the generation of custom forms and reports, and integration of Access with other programs. (F, Sp, Su)
Prerequisite: Reading Level 4
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 140 - Microsoft Outlook
Students will use Outlook to manage typical business office communication needs. The course includes sending and organizing e-mail, creating contacts, managing calendars and scheduling meetings. Students organize and archive data, and use e-mail filters. (F, Sp, Su)
Prerequisite: Reading Level 4
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 160 - Using Project Mgmt Software
Students will learn project management skills utilizing Windows-based project management software. Students work through all phases of setting up a project using multiple case studies that runs throughout the entire course. (F,Sp,Su)
Prerequisite: None
Recommended: Windows familiarity and Reading Level 5
3 Credit hours, 48 Lecture hours

CITA 219 - Advanced Microsoft Word
This course provides advanced level training using Microsoft Word. Topics include advanced table features, mail merge, creating forms, working with master and subdocuments, embedding and linking objects, and macros. (Sp)
Prerequisite: Minimum 2.0 in CITA 119 and Reading Level 4
Recommended: Windows and keyboarding experience
3 Credit hours, 48 Lecture hours

CITA 226 - Microsoft Excel-Advanced
In this course advanced Excel functions and Excel tools will be used to solve business problems. The student will use Solver to calculate optimal solutions and apply Scenarios to analyze cost-volume-profit relationships. Other topics include creating data tables, importing data from other sources, and creating shared workbooks. Macros will be created using the macro recorder and by writing code using Visual Basic for Applications. This course together with content from CITA 126 prepares students for the Microsoft Certified Application Specialist (MCAS) exam. (F,Sp,Su)
Prerequisite: Minimum 2.5 in CITA 126 and Reading Level 5
3 Credit hours, 48 Lecture hours

CITA 229 - Special Topics in Applications
This course offers students the opportunity to learn new computer software application skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the information technology professional. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITA 233 - Advanced Microsoft Access
This course provides advanced level training in the creating of database management systems using Microsoft Access. Instruction includes working with advanced custom reports and forms, advanced queries, advanced relationships, macros, and introductions to the use of SQL and Visual Basic for Applications Code with Access. (F, Sp)
Prerequisite: Minimum 2.0 in CITA 133 and Reading Level 5
Recommended: CITF 108 or equivalent
3 Credit hours, 48 Lecture hours

CITD 120 - SQL Concepts
This course introduces the student to Structured Query Language (SQL). Topics include relational database concepts, queries, special operators, and the join operation. Students will gain experience in ANSII standard SQL. (F,Sp,Su)
Prerequisite: Reading Level 4 and Writing Level 4
Recommended: Windows familiarity
2 Credit hours, 32 Lecture hours

CITD 227 - Database Independent Study
This course includes special research, projects, or other independent study in Database. Students may enroll to update or enhance knowledge, skills, and competencies. Advanced students may explore topics related to, but not included in the curriculum. Grading criteria and course objectives are determined at the first meeting. (F,Sp,Su)
Prerequisite: Department Approval
0.25 TO 4 Credit hours, 4 TO 64 Other hours

CITD 229 - Special Topics in Database
This course offers students the opportunity to learn new Database Management skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the Database professional. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITD 250 - Database Concepts
Students learn the functions of a database management system. The relational model and SQL are used. Normalization and database design are covered. The CODASYL model is discussed and emerging trends are studied. (F)
Prerequisite: Minimum 2.0 in ((CITF 110 or CITF 110 Placement Test) and (CITP 110 or CITP 150 or CITP 110 Placement Test)) and Reading Level 5 and Writing Level 6
3 Credit hours, 48 Lecture hours

CITF 102 - Computer Skills for Non-Majors
This course surveys concepts and uses of software applications: word processors, spreadsheets, and database managers. Terminology, problem solving, and acquisition factors associated with personal computers are discussed. Hands-on computer use is required. (F,Sp,Su)
Prerequisite: None
2 Credit hours, 32 Lecture hours

CITF 103 - Internet Basics
Designed to explore the potential uses of the Internet, students will complete hands-on, skill-based assignments and gain extensive experience utilizing a course management system to access and submit their course work. Students will develop basic skills using e-mail, search engines, modifying and posting a web page template. (F,Sp,Su)
Prerequisite: None
Recommended: Windows familiarity and Reading Level 3 and Writing Level 4
2 Credit hours, 32 Lecture hours

CITF 108 - Microsoft Windows
This course is designed to provide students with a broad base of knowledge that is necessary for enhancing PC productivity through the efficient utilization of Microsoft Windows for file, application, and system use and management. Topics include the use of Windows Interface Objects, Utilities, Help features, Multimedia features, Internet features, closely related applications, and Applets. (F,Sp,Su)
Prerequisite: Reading Level 3
2 Credit hours, 32 Lecture hours

CITF 110 - Intro Computer Info Systems
This course provides an introduction to computers, their role in managing business information systems, their influence on society, and their use in personal productivity. It includes a hands-on introduction to major microcomputer tools: word processors, spreadsheets, presentation software, and database management systems. (F,Sp,Su)
Prerequisite: Reading Level 4 and Writing Level 4
3 Credit hours, 48 Lecture hours

CITF 120 - Operating Systems Concepts
The course covers what operating systems are, why they exist, what they do, and how they interface with the operators and programmers. Main memory management and processor scheduling are studied along with device and file management. Case studies of current operating systems are studied. (F,Sp,Su)
Prerequisite: Reading Level 5
Recommended: CITF 110 and (CITP 110 or CITP 150)
3 Credit hours, 48 Lecture hours

CITF 125 - IT Best Practices & Policies
This course provides students with the knowledge and skills they need to understand and implement best practices and policies for the IT industry. Adherence to best practice helps strengthen supplier/customer relations, make contractual obligations easier, and improve the market position of service providers seen to be compliant with accepted standards. (F,Sp)
Prerequisite: None
3 Credit hours, 48 Lecture hours

CITF 140 - Information Technology Ethics
This course explores the ethical dilemmas that confront IT professionals. Ethical codes of various organizations will be studied. Students will learn to apply critical thinking skills to the discussion of ethical questions. Topics will include privacy, intellectual property rights, software development, network administration, and the use of the Internet. (F,Sp)
Prerequisite: Reading Level 5 and Writing Level 6
3 Credit hours, 48 Lecture hours

CITF 227 - Computer Foundations Ind Study
This course includes special research, projects, or other independent study in a computer foundations area. Students may enroll to update or enhance knowledge, skills, and competencies. Advanced students may explore topics related to, but not included in the curriculum. Grading criteria and course objectives are determined at the first meeting. (F,Sp,Su)
Prerequisite: Department Approval
0.25 TO 4 Credit hours, 4 TO 64 Other hours

CITF 229 - Special Topics in Foundations
This course offers students the opportunity to learn new computer foundational skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the information technology professional. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITF 240 - IT Project Management
This course provides a comprehensive introduction to IT Project Management and covers the basic concepts of project scope, planning, execution, and closure. Students will develop project plans; track to those plans; manage ambiguity and risks; and make changes to the plan. This course covers the objectives for CompTIA Project+ certification. (F,Sp)
Prerequisite: Minimum 2.0 in (CITF 110 or CITF 200) and Reading Level 4 and Writing Level 4
3 Credit hours, 48 Lecture hours

CITF 260 - Systems Analysis and Design
This course presents concepts and techniques used in the development of computer business application systems. The traditional approach for systems development is presented and compared to the approach used in a 4th Generation Environment. Techniques for structured analysis and project management techniques will be used. Recent developments in analysis, including Computer Assisted Software Engineering (CASE) and Object-Oriented Analysis will be introduced. (Sp)
Prerequisite: Minimum 2.0 in (CITF 110 and (CITP 110 or CITP 150)) and Reading Level 5 and Writing Level 6 and Math Level 4
4 Credit hours, 64 Lecture hours

CITN 115 - Home Technology Integration
This course provides an introduction to home technology integration with emphasis on the following: computer networking, audio/video, home security, industry standards, home lighting control, HVAC management, water system controls, home access controls and automated home features, low voltage wiring, and user interfaces. All topics are covered in lecture and lab experiments. (F,Sp)
Prerequisite: Reading Level 4 and Writing Level 4
5 Credit hours, 64 Lecture hours, 32 Lab hours

CITN 120 – Networking Concepts
The student in this course learns the fundamentals of Local Area Networks (LANs) and Wide Area Networking (WAN). Communication standards such as the OSI 7 layer model are introduced. Business and consumer use of these technologies will be discussed. (F,Sp,Su)
Prerequisite: Reading Level 4 and Writing Level 4
Recommended: CITF 110
3 Credit hours, 48 Lecture hours

CITN 220 – Introduction to Networks
This course introduces architecture, structure, functions, components, and models of computer networks, including the Internet. Students examine networking layers, their roles and services, and learnt to build and troubleshoot basic LANs. This course follows the objectives for the first course in the Cisco Networking Academy CCNA Routing and Switching curriculum. (F, Sp)
Prerequisite: Minimum 2.0 in CITS 125 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 222 - Wireless Networking & Security
This course provides the student with the ability to understand the fundamentals of RF networks and describe the functionality of WLAN components. Students are provided with the skills to install, configure, secure, and troubleshoot WLAN hardware peripherals and protocols. This course prepares the student for various wireless certification exams. (F,Sp)
Prerequisite: Minimum 2.0 in CITS 125 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 225 - Routing & Switching Essentials
This course describes the architecture, components, and operations of devices in a small network. Students learn how to configure a router and a switch for basic functionality. This course is the second in the Cisco Networking Academy CCNA Routing and Switching curriculum, and can lead to Cisco CCENT Certification. (F,Sp)
Prerequisite: Minimum 2.0 in CITN 220 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 227 - Networking Independent Study
This course includes special research, projects, or other independent study in Networking. Students may enroll to update or enhance knowledge, skills, and competencies. Advanced students may explore topics related to, but not included in the curriculum. Grading criteria and course objectives are determined at the first meeting. (F,Sp,Su)
Prerequisite: Department Approval
0.25 TO 4 Credit hours, 4 TO 64 Other hours

CITN 228 - VoIP Fundamentals
VoIP Fundamentals provides the foundation for gaining hands-on skills and understanding of IP based voice packet telephony. Students will use available tools to evaluate the efficiency of IP voice networks while learning how to analyze, discuss, and demonstrate call quality issues and discuss the key standards and technologies in VoIP. (F,Sp)
Prerequisite: Minimum 2.0 in CITN 225 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 229 - Special Topics in Networking
This course offers the opportunity to learn new computer networking skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the networking profession. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITN 230 - Linux/UNIX Operating System
The student in this course learns to install, use and administer a Linux operating system, including user account management, network operation, and application software for Linux. Practical hands-on training is used throughout. (F,Sp)
Prerequisite: Minimum 2.0 in ((CITF 120 or CITF 120 Placement Test) and (CITN 220 or CITS 225)) and Reading Level 5 and Writing Level 6 and Math Level 3
3 Credit hours, 48 Lecture hours

CITN 239 - Special Topics/Networking P/Z
This course offers the opportunity to learn new computer networking skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the networking profession. This course will be graded on a Pass/Fail basis. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITN 240 – Scaling Networks
This Course describes the architecture, components, and operations of routers and switches in a larger and more complex network. Students learn how to configure routers and switches for advanced functionality. This course is the third in the Cisco Networking Academy CCNA Routing and Switching curriculum. (F,Sp)
Prerequisite: Minimum 2.0 in CITN 225 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 244 - Securing Networking Devices
This course introduces students to basic tasks needed to secure network routers and switches. Students will gain hands-on experience securing Cisco devices. This course covers the objectives of the Cisco Certified Network Associate - Security course (CCNA-S). (F,Sp)
Prerequisite: Minimum 2.0 in CITN 225 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 245 – Connecting Networks
This course discusses the WAN technologies and network services required by converged applications in a complex network. This course is the fourth course in the Cisco Networking Academy CCNA Routing and Switching curriculum and can lead to Cisco CCNA Routing and Switching Certification. (F,Sp,Su)
Prerequisite: Minimum 2.0 in CITN 240 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITN 250 - Microsoft Network Server
The student in this course learns installation, security, and best administration techniques for Microsoft Windows Servers. (F,Sp)
Prerequisite: Minimum 2.0 in (CITF 120 and (CITN 220 or CITS 225)) and Reading Level 5 and Writing Level 6 and Math Level 3
3 Credit hours, 48 Lecture hours

CITN 280 - IT Security Foundations
This course provides a comprehensive introduction to IT security, covering basic concepts of data integrity, confidentiality, and availability, and focusing on relevant threats and countermeasures. Students will be prepared to evaluate Information Security needs of organizations and to develop policies addressing these needs. This course covers the objectives identified for CompTIA Security+ certification. (F,Sp)
Prerequisite: Minimum 2.0 in (CITN 220 or CITS 225) and Reading Level 5 and Writing Level 6 and Math Level 3
Recommended: CITN 230 or CITN 250
3 Credit hours, 48 Lecture hours

CITN 295 - CCNA Review
This course is a review of the materials leading to the Cisco Certified Network Associate (CCNA Routing and Switching) certification. It reviews networking fundamentals, routing concepts, switches, wireless, LANs, and WANS, This course reviews the Cisco Networking Academy CCNA Routing and Switching curriculum that leads to the Cisco CCNA Routing and Switching Certification. (F, Sp)
Prerequisite: Minimum 2.0 in CITN 245 and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITP 110 - Intro to Computer Programming
Students are introduced to the fundamental techniques for understanding, designing, constructing , and testing object-oriented programs. Topics include: structured program design; basic programming control structures; functions; classes; methods; user interface design; and working with data. Students are required to complete computer-based assignments using Python. (F,Sp)
Prerequisite: Reading Level 5 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 130 – Intro to Mobile App Devel
The course will introduce students to the various platforms and application (apps) in use on mobile devices. Platforms will include Apple iOS, Google Android OS, and others as appropriate. Students will create applications (apps), test, and debug for each platform using specialized development environments. (F, Sp, Su)
Prerequisite: Minimum 2.0 in (CITP 110 or CPSC 230) and Reading Level 5 and Writing Level 6 and Math Level 4
3 Credit hours, 48 Lecture hours

CITP 140 - Software Testing
This course is an introduction to software testing and quality assurance. The fundamentals of software testing are covered including test planning, test case design, the types of testing, such as performance and regression. Also covered are test management, automation, and how people and organizational issues affect testing. (F, Sp)
Prerequisite: Minimum 2.0 in (CITP 110 or concurrently) and Reading Level 5 and Math Level 4
3 Credit hours, 48 Lecture hours

CITP 150 - Intro to VB.NET Programming
This course introduces students to programming concepts through the use of the Visual Basic.NET programming environment. Students learn to develop business applications by designing and creating a user interface and writing the necessary procedures. Students also learn and use logic development tools and object oriented programming terminology and techniques. (F,Sp)
Prerequisite: Minimum 2.0 in (CITP 110 or CPSC 230) and Reading Level 5 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 180 - Intro to C#.NET Programming
Students will use Microsoft Visual Studio .NET to become familiar with the C# .NET programming language by designing, implementing, and testing programming projects. Topics include creating and using methods and classes; inheritance; exception handling, and using controls. (F,Sp)
Prerequisite: Minimum 2.0 in (CITP 110 or CPSC 230) and Reading Level 5 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 190 - Intro to Programming in JAVA
This course introduces students to basic programming concepts using the Java Programming language. It introduces object-oriented programming methodology and features provided by the Java language. During the course, students will review sound programming practices and learn accepted Java programming procedures. Students will create and modify simple Java applications and applets. (F,Sp)
Prerequisite: Minimum 2.0 in (CITP 110 or CPSC 230) and Reading Level 5 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 220 - Game Design & Development
This course provides a hands-on introduction to special research and projects utilizing Web development and programming skills. Student may enroll to update or enhance knowledge, mastery, and competencies. Specific content may vary with each offering and will be related to gaming, simulation, and software development industries. (F, Sp, Su)
Prerequisite: Minimum 2.0 in CITP 180 and Reading Level 5 and Writing Level 6 and Math Level 4
Recommended: CITP 150
2 Credit hours, 64 Lab hours

CITP 227 - Programming Independent Study
This course includes special research, projects, or other independent study in Programming. Students may enroll to update or enhance knowledge, skills, and competencies. Advanced students may explore topics related to, but not included in the curriculum. Grading criteria and course objectives are determined at the first meeting. (F,Sp,Su)
Prerequisite: Department Approval
0.25 TO 4 Credit hours, 4 TO 64 Other hours

CITP 229 - Special Topics in Programming
This course offers students the opportunity to learn new computer programming skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the computer programming profession. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITP 230 - Mobile App Devel for Android
This course provides advanced level training in the creating of database management systems using Microsoft Access. Instruction includes working with advanced custom reports and forms, advanced queries, advanced relationships, macros, and introductions to the use of SQL and Visual Basic for Applications Code with Access. (F, Sp)
Prerequisite: Minimum 2.0 in CITP 130 and Reading Level 5 and Writing Level 6 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 235 - Mobile App Devel for Apple
This course teaches students to develop applications (Apps) for mobile devices using an Apple computer. Programming language (SDK Software Development Kit) taught will feature C/Objective-C and/or Swift for iOS Development. Students will create several mobile applications via Apple's Xcode (IDE) to run on Apple mobile devices. (F, Sp)
Prerequisite: Minimum 2.0 in CITP 130 and Reading Level 5 and Writing Level 6 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 240 - Advanced Software Testing
This course is the second in a sequence of software testing classes. It covers in more detail testing procedures, test management, and testing techniques. Also included are test tools and automation as well as people skills and team composition for a successful quality assurance team. (Sp)
Prerequisite: Minimum 2.0 in CITP 140 and Reading Level 5 and Math Level 4
3 Credit hours, 48 Lecture hours

CITP 250 - Advanced VB.NET Programming
This course is a second course in the VB.NET programming sequence and leads to the creation of functional Windows and Web based application programs. Topics include writing user requirements, creating test scenarios and test plans, advanced form design, error handlers, data validation, object oriented programming concepts, database access and programming, use of collections and developing help systems. (Sp)
Prerequisite: Minimum 2.0 in CITP 150 and Reading Level 5 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 280 - Advanced C#.NET Programming
Students will use Microsoft Visual Studio .NET to become familiar with advanced C#.NET programming concepts including database and web programming. Topics include using threads, database interaction using ADO.Net, interfacing to Crystal Reports, and creating web applications. (F,Sp)
Prerequisite: Minimum 2.0 in CITP 180 and Reading Level 5 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 290 - Adv JAVA Programming for Busn
This course introduces advanced Java Programming concepts. Students will use sound programming practices and accepted Java programming procedures. Students will create and modify computer programs as might be encountered in creating Java applications for industry. Topics covered in this course provide a strong preparation for the Sun Certified Programmer Certification. (F,Sp,Su)
Prerequisite: Minimum 2.0 in (CITP 190 and (CITW 160 or concurrently)) and Reading Level 5 and Writing Level 6 and Math Level 4
4 Credit hours, 64 Lecture hours

CITP 295 - Programming Internship
This internship provides the student with on-the-job experience as a computer programmer. The student is expected to write or maintain programs, test programs, create documentation, and perform analysis. It is designed to be the culmination of the Computer Programmer/Analyst Associate Degree and as final preparation for entering the job market. (F,Sp,Su)
Prerequisite: Department Approval
3 Credit hours, 200 Other hours

CITS 125 - Computer Support: A+ Cert Prep
This course provides students with the skills to diagnose and correct problems that computer users encounter. The student receives practical hands-on experience in installing, maintaining, and troubleshooting computer hardware and software while developing their communication skills and professionalism. This course includes the current CompTIA A+ certification exams that are required to receive CompTIA A+ certification. (F,Sp)
Prerequisite: Reading Level 5 and Writing Level 4 and Math Level 3
6 Credit hours, 96 Lecture hours

CITS 143 - Hardware Support Skills
This course provides students with skills in three separate areas; schematic drawing, soldering, and test equipment operation. Students will learn how to read and write schematic diagrams, identify electronic components, solder and desolder components on printed circuit boards and operate electronic test equipment used in PC repair. (F, Sp)
Prerequisite: Reading Level 5 and Writing Level 2
4 Credit hours, 64 Lecture hours

CITS 160 - Logic Problems Analysis
Course topics include manipulation of formulas used in electronics, basic gate operation, truth tables, Boolean algebra, binary, octal and hexadecimal base number systems. (F,Sp)
Prerequisite: Reading Level 5 and Writing Level 2 and Math Level 4
Recommended: Math Level 5
3 Credit hours, 48 Lecture hours

CITS 170 - Basic Electronic for PC Repair
This course begins with basic electricity concepts and discusses basic electricity, basic electronics, electric circuits, diodes, transistors, digital devices, and digital circuits. Course work includes lab exercises each week. (F)
Prerequisite: Reading Level 5 and Writing Level 2 and Math Level 4
Recommended: CITS 160 or Math Level 5
6 Credit hours, 80 Lecture hours, 32 Lab hours

CITS 176 - PC Hardware Troubleshooting
This course provides students with the skills necessary to troubleshoot and repair desktop and laptop computers. Students will be instructed in the proper selection and use of the tools needed to perform diagnostics and preventative maintenance on personal computers. The course also stresses the importance of following proper safety and ESD procedures. (Sp)
Prerequisite: Minimum 2.0 in CITS 170 and Reading Level 5 and Writing Level 2 and Math Level 4
6 Credit hours, 96 Lecture hours

CITS 181 - Computer Diagnostic Software
Topics include the computer POST test, software diagnostic programs, hardware diagnostic cards, and other computer troubleshooting equipment. Coursework includes lab exercises each week. (Sp)
Prerequisite: Minimum 2.0 in (CITS 125 or CITS 176 or concurrently) and Reading Level 5 and Writing Level 2 and Math Level 4
2 Credit hours, 32 Lecture hours

CITS 225 - Networking for PC Technicians
This course provides students with the practical skills to setup, maintain, and manage Local Area Networks. Students will receive a comprehensive introduction to networking standards and protocols, networking hardware and software, transmission basics, Internet connectivity, wireless networking, network security, and convergence technologies. This course includes the CompTIA Network+ certification exam. (F,Sp)
Prerequisite: Minimum 2.0 in CITS 125 and Reading Level 5 and Writing Level 4 and Math Level 3
4 Credit hours, 64 Lecture hours

CITS 227 - Comp Support Independent Study
This course includes special research, projects, or other independent study in Computer Support. Students may enroll to update or enhance knowledge, skills, and competencies. Advanced students may explore topics related to, but not included in the curriculum. Grading criteria and course objectives are determined at the first meeting. (F,Sp,Su)
Prerequisite: Department Approval
0.25 TO 4 Credit hours, 4 TO 96 Other hours

CITS 229 - Special Topics/Support
This course offers the opportunity to learn new computer support skills and knowledge. Specific up-to-date content will vary with each offering and will be related to the computer support profession. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

CITS 285 - IT Professional Internship
Designed to be the culmination of information systems students' associate degree program. It is intended to give the student live work experiences as a specialist in computer systems or support. It is to be taken at the end of the student's curriculum as final preparation for entering the job market. (F,Sp,Su)
Prerequisite: Department Approval
2 TO 3 Credit hours, 108 TO 160 Other hours

CITW 150 - Internet Literacy
This course teaches hands-on skills and builds knowledge for Internet professionals. It is designed to explore the potential uses of the Internet for business and communication including the use of email, search engines, discussion boards, and other Internet applications including web page development. This course also discusses the rapidly changing world of the Internet. (F,Sp,Su)
Prerequisite: Reading Level 5 and Writing Level 6
Recommended: Windows familiarity
3 Credit hours, 48 Lecture hours

CITW 160 - Web Site Dsgn & Development I
This course explores techniques of web page construction using HTML and CSS languages. Students will construct individual web pages using HTML to contain graphics, text, and web forms with presentation controlled by CSS style sheets. Within a team, students will demonstrate their understanding and application of the concepts introduced during the semester. (F, Sp, Su)
Prerequisite: Reading Level 5 and Writing Level 6
3 Credit hours, 48 Lecture hours

CITW 165 - Web Site Dsgn & Development II
This course explores advanced techniques of web page and website construction using HTML, HTML5, CSS, CSS3, and JavaScript for website behavior. Students will create several W3C compliant web pages that will respond to user input (client-side) via Browsers using these technologies. (F,Sp)
Prerequisite: Minimum 2.0 in CITW 160 and Reading Level 5 and Writing Level 6
3 Credit hours, 48 Lecture hours

CITW 175 - Web Site Management
This course presents a comprehensive introduction to web site planning, promotion, security, and legal issues associated with web site management. Students explore web-based communication tools, domain names, web site hosting, shopping cart software and manage an individual web site to demonstrate concepts presented throughout the semester. (F,Sp)
Prerequisite: Minimum 2.0 in (CITW 160 or ARTS 173 or concurrently) and Reading Level 5 and Writing Level 6
3 Credit hours, 48 Lecture hours

CITW 180 - ASP.NET Web Development
This course provides instruction in building web sites using Microsoft ASP.NET. Students create dynamic, flexible, and interactive web pages that interact with a database. Students explore server controls, validation controls, security issues, user authentication, and manage an individual web site to demonstrate concepts presented throughout the semester. (Sp)
Prerequisite: Minimum 2.0 in (CITW 160 and (CITP 150 or CITP 180)) and Reading Level 5 and Writing Level 6 and Math Level 4
4 Credit hours, 64 Lecture hours

CITW 185 - PHP Web Development
This course provides instruction in building web sites using PHP scripting language. Students will learn how to create dynamic, flexible, and interactive web pages, connect to and update a MySQL database as well as develop an individual web site throughout the semester. (F, Sp)
Prerequisite: Minimum 2.0 in (CITW 160 or ARTS 173 or concurrently) and Reading Level 5 and Writing Level 6
4 Credit hours, 64 Lecture hours

CITW 227 - Web Independent Study
This course includes special research, projects, or other independent study in computer web skills. Students may enroll to update or enhance knowledge, skills, and competencies. Advanced students may explore topics related to, but not included in the curriculum. Grading criteria and course objectives are determined at the first meeting. (F,Sp,Su)
Prerequisite: Department Approval
0.25 TO 4 Credit hours, 4 TO 64 Other hours

CITW 229 - Special Topics/Web
This course offers students the opportunity to learn new computer web skills and knowledge related to the World Wide Web. Specific up-to-date content will vary with each offering and will be related to the computer web profession. (F,Sp,Su)
Prerequisite: Determined by Section
0.25 TO 6 Credit hours, 4 TO 96 Lecture hours

GRET100 - GIS Principles & Applications
3 Credits/4 Billing Hours
This entry level course explores the fundamental concepts underlying all geographic information systems. These concepts will be demonstrated by examining how GIS is used in planning, law enforcement, medicine, asset management, transportation and other fields. (F)
Prerequisite: None

GRET110 - Beginning ArcGIS Desktop
3 Credits/5 Billing Hours
This course is an introduction in the use of ArcGIS Desktop software. ArcGIS is a leading product used in the design of Geographic Information Systems (GIS). Students will learn the basic functionality of this software. GIS principles will also be covered. The course will rely on lectures, an on-line virtual campus course, and hands-on experience in the lab. (Sp)
Prerequisite: Reading Level 3 and Math Level 4
Recommended: Computer experience

GRET120 - Advanced ArcGIS
3 Credits/5 Billing Hours
This course will build on the fundamentals learned in GRET 110. Students will use ArcGIS tools and processing to complete a series of assigned projects. Students will learn modeling and analysis techniques using a variety of vector and raster datasets. Students will conceptualize, design, implement and present a final project. (F)
Prerequisite: Minimum 2.0 in GRET 110 (previously GRET 255) and Reading Level 3 and Math Level 4

GRET175 - Special Topics/GIS Technology
.25 to 8 Credits/.25-11 Credit Hours
This course offers students the opportunity to learn new or advanced skills in Geographic Information Systems Technology and other related topics. Specific content may vary with each offering and will be related to the Geographic Information Systems Technology Program. (F,Sp,Su)
Prerequisite: Determined by Section

GRET210 - Global Positioning Systems
3 Credits/4 Billing Hours
This course covers the basic principles necessary to set up, operate, and run a Global Positioning System (GPS) receiving station, as well as collect information with a receiver. Data collection will be incorporated into a computer database program. The information link with Geographic Information Systems (GIS) and the use of GPS in GIS will be demonstrated. (F)
Prerequisite: None

GRET220 - Hydrological Systems
3 Credits/4 Billing Hours
This course will cover the various aspects of water resources as they pertain to the geographic information system environments. Water systems, natural and man-made, will be emphasized. The evaluation, analysis, and environmental impacts of various water features as they pertain to environmental research and development will be highlighted. (F)
Prerequisite: None

GRET240 - Cartography in GIS
3 Credits/4 Billing Hours
The basic principles, functions, and origins of maps will be discussed. The student will construct various types of maps. Computer-offered map planning and design along with how to read, print, and design maps will also be covered. (Sp)
Prerequisite: Minimum 2.0 in (GRET 110 (previously GRET 255) or concurrently) and Reading Level 3 and Math Level 4

GRET241 - Remote Sens/AirPhoto Interpret
3 Credits/4 Billing Hours
This course will include the development of skills necessary for basic interpretation of aerial photography data, how it is collected, and the ability to analyze maps created from the data collected in this method. The current technology and GIS relationship will be highlighted. (Sp)
Prerequisite: Minimum 2.0 in GRET 110 (previously GRET 255) and Reading Level 3 and Math Level 4

GRET260 - Automating Workflows in GIS
3 Credits/4 Billing Hours
This course will explore a variety of ways to automate workflows in ArcGIS Desktop product. In addition to using "batch" functionality in ArcGIS Desktop, the student will be exposed to Model Builder and creating Python scripts. (Sp)
Prerequisite: Minimum 2.0 in GRET 110 (previously GRET 255) and Reading Level 3 and Writing Level 2 and Math Level 4

GRET264 - Web GIS
3 Credits/4 Billing Hours
This course will explore a variety of ways to migrate GIS maps and data to the internet for public viewing. Technologies covered will include Google Earth, Bing maps, and ArcGIS Explorer. (F)
Prerequisite: Minimum 2.0 in GRET 110 (previously GRET 255) and Reading Level 3 and Writing Level 2 and Math Level 4

GRET271 - Parcel Mapping
3 Credits/5 Billing Hours
This course will teach students how to interpret and produce ownership parcels based on legal descriptions in a GIS environment. It will also introduce a software product, IcoMap, specifically designed for this purpose. (F)
Prerequisite: Minimum 2.0 in GRET 110 (previously GRET 255) and Reading Level 3 and Writing Level 2 and Math Level 4

GRET275 - GIS Proj Mgmt & Implementation
3 Credits/4 Billing Hours
This is a capstone course designed for students to develop the skills necessary for the design and implementation of GIS. The student will present his/her project to a client and train the client in the system that they developed. The student will also develop skills in project management and system documentation. (Sp)
Prerequisite: Department Approval

GRET277 - Advanced GIS Data Structures
3 Credits/4 Billing Hours
This course will explore the use of GIS technology in creating, managing, and using geographic networks. Transportation, utility, and hydrology networks will be created and analyzed using the ArcGIS Desktop product. (Sp)
Prerequisite: Minimum 2.0 in GRET 110 (formerly GRET 255) and Reading Level 3 and Writing Level 2 and Math Level 4

GRET290 - GIS Internship
2 to 4 Credits
This course provides Geographic Information Systems (GIS) students with practical work experience in industry. Students work for an employer in a supervised environment which provides an opportunity to apply knowledge and skills learned in the classroom and lab to an actual job situation. (F, Sp, Su)
Prerequisite: Department Approval