KENTUCKY STATE UNIVERSITY

CERTIFICATES IN COMPUTER SCIENCE

The School of Mathematics and Computer Science offers a range of professional certificates designed to equip students with practical, in-demand skills for today's technology-driven workforce. These certificates include Computer Technician (p. 1), Cybersecurity (p. 1), Data Analytics (p. 1), Information Assurance (p. 2), Network Associate (p. 2), and Network Professional (p. 3). Each program combines foundational knowledge with hands-on experience, preparing graduates for industry-recognized certifications, career advancement, or further academic study in related fields.

The Computer Technician Certificate, offered by the School of Mathematics and Computer Science, consists of 6 credit hours and is designed to provide students with the fundamental skills necessary to install, maintain, and troubleshoot computer hardware and software systems. This short, intensive program focuses on the core competencies required for entry-level positions in IT support and technical services.

Students will gain hands-on experience in areas such as PC assembly and repair, operating system installation, hardware diagnostics, and basic networking. The coursework may align with industry-recognized certifications such as CompTIA A+, helping to prepare students for professional certification exams and immediate employment opportunities.

Ideal for students seeking a fast-track credential or a stepping stone into more advanced IT programs, the Computer Technician Certificate is especially valuable for individuals interested in roles such as help desk technician, IT support specialist, or computer repair technician.

Whether you're looking to launch a career in information technology or strengthen your technical skills for use in another field, this certificate offers a practical and efficient path into the world of computer systems and support services.

The Certificate is available to students, regardless of major, who complete the specified coursework, and while prior technical/security experience, training, or education may be beneficial, none is required. The concepts and skills acquired in this program may assist a student to sit for the internationally recognized CompTIA A+ certification.

All courses must be passed with a "C" or better. The Certificate requires the completion of:

Course	Title	Hours
Year 1		
CIT 136	Comp Hardware: Mgmt/Maint	3
CIT 137	Comp OS Sys: Manage & Maint	3
	Hours	**6**
	Total Hours	**6**

The Computer Cyber Security Certificate, offered by the School of Mathematics and Computer Science, consists of 12 to 13 credit hours and is designed to equip students with essential skills and knowledge in the growing field of cybersecurity. This certificate provides a focused curriculum that prepares students to understand, identify, and respond to a wide range of digital threats and security challenges faced by individuals, organizations, and governments.

The coursework typically includes foundational topics such as network security, ethical hacking, digital forensics, information assurance, and system vulnerabilities. Students learn how to assess risks, implement protective measures, and investigate security breaches using industry-standard tools and techniques. Some programs may also include an introductory course in programming or information systems to support students with limited technical backgrounds.

This certificate is ideal for students pursuing degrees in computer science, information systems, criminal justice, or business, as well as for working professionals looking to up-skill or transition into the cybersecurity field. It provides a strong foundation for entry-level roles such as security analyst, IT support technician with a focus on security, or for further study in advanced cybersecurity programs or certifications.

In an era where data protection and digital privacy are more critical than ever, the Computer Cyber Security Certificate offers a practical, career-oriented credential that opens doors to one of the fastest-growing areas in the tech industry.

The Certificate is available to students, regardless of major, who complete the specified coursework, and while prior technical/security experience, training, or education may be beneficial, none is required.

All courses must be passed with a "C" or better. The Certificate requires the completion of:

Code	Title	Hours
COS 281	Introduction to Info. Sec. & A	3
Select any three of the courses below		9
COS 332	Management Information Securit	
COS 334	Computer Forensics	
COS 483	Database Security	
COS 484	Intro to Network Security	
Total Hours		**12**

The Database Analytics Certificate, offered by the School of Mathematics and Computer Science, requires the completion of 26 credit hours and is designed to equip students with advanced skills in data management, analysis, and interpretation essential for data-driven decision making. This comprehensive program combines theoretical knowledge with practical experience in database systems, data analytics, and business intelligence tools.

Students will study core topics such as database design and implementation, SQL programming, data warehousing, data mining, and statistical analysis. The curriculum also includes courses on big data technologies, data visualization, and machine learning fundamentals to prepare students for the evolving landscape of data analytics. Emphasis is placed on hands-on projects, enabling students to work with real-world datasets and develop actionable insights.

This certificate is ideal for students and professionals in fields such as computer science, business, economics, healthcare, and social sciences who seek to enhance their data skills for roles like data analyst,

database administrator, or business intelligence specialist. Graduates will be proficient in managing complex databases, extracting meaningful patterns from large datasets, and communicating findings effectively to support organizational goals.

Whether you aim to deepen your expertise in data analytics or pivot to a career focused on data-driven solutions, the Database Analytics Certificate offers a rigorous and career-relevant path to mastering the tools and techniques that power today's information economy.

Students admitted to this certificate program must meet these prerequisites before enrolling in this coursework: Show proof you have successfully attained knowledge of any computer programming language OR successfully enroll in and pass COS 107 Problem Solving, Logic, and Design or equivalent course prior to enrollment in these courses.

All courses must be passed with a "C" or better. The Certificate requires the completion of:

Code	Title	Hours
COS 108	Prin Computer Science I	4
COS 109	Prin Computer Sci II	4
COS 200	Computer Information Systems	3
COS 310	Discrete Computing Structures	3
COS 340	Data Struc Algorithm Analy	3
COS 364	Data Storage and Data Mining	3
COS 410	Database Management Systems	3
COS 483	Database Security	3
Total Hours		**26**

The Information Assurance Certificate, offered by the School of Mathematics and Computer Science, requires the completion of 27 credit hours and is designed to provide students with comprehensive knowledge and skills in protecting information systems and managing cybersecurity risks. This rigorous program focuses on the principles and practices necessary to ensure the confidentiality, integrity, and availability of data in diverse computing environments.

Students will engage with core topics such as network security, cryptography, risk management, ethical hacking, digital forensics, and security policy development. The curriculum combines theoretical foundations with hands-on experience, enabling students to identify vulnerabilities, implement security measures, and respond effectively to cyber threats and incidents. Emphasis is placed on real-world applications and compliance with industry standards and legal frameworks.

The Information Assurance Certificate is ideal for students and professionals in computer science, information technology, business, and related fields who seek to advance their expertise in cybersecurity and information protection. Graduates will be well-prepared for roles such as information security analyst, cybersecurity consultant, risk manager, and security auditor, as well as for pursuing advanced certifications like CISSP or CISA.

In today's increasingly digital and interconnected world, the Information Assurance Certificate offers a vital credential that equips students with the tools and knowledge to safeguard critical information assets and support organizational resilience against evolving cyber threats.

The Certificate is available to students, regardless of major, who complete the specified coursework, and while prior technical/security experience, training, or education may be beneficial, none is required.

All courses must be passed with a "C" or better. The Certificate requires the completion of:

Code	Title	Hours
COS 108	Prin Computer Science I	4
COS 109	Prin Computer Sci II	4
COS 170	Networking Fundamentals	3
COS 281	Introduction to Info. Sec. & A	3
COS 301	Computer Organization	4
COS 302	Operating Systems	3
COS 330	Cloud Security	3
COS 484	Intro to Network Security	3
Total Hours		**27**

The Network Associate Certificate, offered by the School of Mathematics and Computer Science, consists of 12 credit hours and is designed to prepare students for entry-level positions in computer networking and IT infrastructure support. This certificate provides a practical, hands-on introduction to networking concepts, technologies, and troubleshooting techniques commonly used in business and organizational environments.

The curriculum typically covers key areas such as network fundamentals, routing and switching, TCP/IP protocols, wireless networking, and network security. Students will also gain experience with configuring routers, switches, and other network devices using industry-standard tools and simulation software. The coursework may align with the content of professional certifications such as CompTIA Network+ or Cisco Certified Network Associate (CCNA), giving students a competitive edge in the job market.

This certificate is ideal for students pursuing careers in IT, cybersecurity, or systems administration, as well as for professionals looking to enhance their technical skill set. Upon completion, students will be equipped with the foundational knowledge necessary for roles such as network technician, IT support specialist, or junior network administrator.

Whether you're beginning your journey in information technology or looking to specialize in networking, the Network Associate Certificate offers a focused, career-oriented program that builds essential skills for today's connected world.

The Certificate is available to students, regardless of major, who complete the specified coursework, prior technical/security experience, training, and or education would be beneficial as this certificate is directly related to the Cisco Certified Network Associate program.

All courses must be passed with a "C" or better. The Certificate requires the completion of:

Course	Title	Hours
Year 1		
CIT 111	Network Fundamentals	3
CIT 112	Router Theory and Config	3
CIT 211	LAN Switching and Wireless	3
CIT 212	Intro to WAN Technology	3
	Hours	**12**
	Total Hours	**12**

The Network Professional Certificate, offered by the School of Mathematics and Computer Science, consists of 9 credit hours and is designed to provide students with advanced knowledge and practical skills in network design, implementation, and management. This focused program builds on foundational networking concepts and prepares students for more specialized roles within the IT and telecommunications industries.

The curriculum typically covers topics such as advanced routing and switching, network security, wireless networks, and network troubleshooting. Students gain hands-on experience configuring and managing enterprise-level network infrastructures using industry-standard tools and protocols. The coursework aligns with key industry certifications such as Cisco's CCNA and CCNP, preparing students to excel in certification exams and real-world networking environments.

Ideal for IT professionals, computer science students, and anyone seeking to deepen their expertise in networking technologies, this certificate equips graduates with the skills necessary to design secure, efficient, and scalable networks. Career opportunities for certificate holders include network engineer, network administrator, systems analyst, and cybersecurity specialist.

Whether you're advancing your current IT career or looking to specialize in network technologies, the Network Professional Certificate offers a practical and career-focused curriculum tailored to meet the demands of today's rapidly evolving digital infrastructure.

The Certificate is available to students, regardless of major, who complete the specified coursework, prior technical/security experience, training, and or education would be beneficial as this certificate is directly related to the Cisco Certified Network Professional program.

All courses must be passed with a "C" or better. The Certificate requires the completion of:

Course	Title	Hours
Year 1		
CIT 311	Advanced Routing	3
CIT 312	Advanced LAN Switching	3
CIT 412	Optimizing Converged Networks	3
	Hours	**9**
	Total Hours	**9**