

Computing Foundations for a Digital Age

Career Cluster	CTE
Program of Study	
NLPS Sequence	
Course Code	4565
Course Description	<i>Computers and the internet have revolutionized the way we access and disseminate information. As technology continues to change at an ever-increasing pace, the need for students to gain a foundational understanding of computer science is clear. Computing Foundations for a Digital Age is designed to introduce students to five major topics within computer science including computing systems, networks and the internet, data and analysis, algorithms and planning, and impacts of computing. The course introduces foundational computing concepts while exploring current events and building critical thinking, collaboration, problem solving, and other important skills that are invaluable for life in a global and technologically advancing society.</i>
Prerequisite(s)/ Corequisite(s)	None
Credits	1 semester, 1 credit
Counts Toward	Computer science requirement pursuant to Indiana Code IC 20-32-4-18.
Dual Credit Status	
Additional Notes	

ADDITIONAL COURSE INFO

Funding	
Bulletin 400	<ul style="list-style-type: none"> ● Any 5-12 secondary educator with a valid Indiana licensure (i.e., instructional, administrator, counselor) and computer science/information technology (IT)/business professional development, training, or work experience ● Adjunct teacher holding a locally-issued adjunct teacher permit for teaching at the secondary level with work experience or training in computer science/information technology (IT)/business
Rules 46-47	<ul style="list-style-type: none"> ● Any 5-12 secondary educator with a valid Indiana licensure (i.e., instructional, administrator, counselor) and computer science/information technology (IT)/business professional development, training, or work experience ● Adjunct teacher holding a locally-issued adjunct teacher permit for teaching at the secondary level with work experience or training in computer science/information technology (IT)/business
Rules 2002	<ul style="list-style-type: none"> ● Any 5-12 secondary educator with a valid Indiana licensure (i.e., instructional, administrator, counselor) and computer science/information technology (IT)/business professional development, training, or work experience ● Adjunct teacher holding a locally-issued adjunct teacher permit for teaching at the secondary level with work experience or training in computer science/information technology (IT)/business

REPA/REPA 3	<ul style="list-style-type: none"> Any 5-12 secondary educator with a valid Indiana licensure (i.e., instructional, administrator, counselor) and computer science/information technology (IT)/business professional development, training, or work experience Adjunct teacher holding a locally-issued adjunct teacher permit for teaching at the secondary level with work experience or training in computer science/information technology (IT)/business
--------------------	--

POSTSECONDARY AND CREDENTIAL INFORMATION

ITCC Course Alignment	
VU Course Alignment	
Four Yr. Course Alignment	
Postsecondary Credential	
Liberal Arts/Sciences Requirements	
Promoted Certifications	

CONTENT STANDARDS AND COMPETENCIES

Competency #	Competency
Domain	Computer Science
4565.D1.1	Students create an understanding of computer science and explore how it impacts their everyday lives.
4565.D1.2	Create a definition of computer science and computational thinking and explore growing and emerging careers in the computer science and information technology fields, as well as how changing technology impacts careers in all sectors.
4565.D1.3	Demonstrate awareness of the history of computing.
4565.D1.4	Investigate trends in computer science and their impact on society.
4565.D1.5	Summarize ethical issues within computer science.
Domain	Computers, Devices, and Other Technologies
4565.D2.1	Students analyze computer devices and other technologies to build an understanding of their impact on society and how to use them appropriately.
4565.D2.2	Demonstrate understanding of the hardware and operating systems of computers and identify and analyze aspects such as functionality, cost, size, speed, accessibility, and aesthetics of hardware and software.
4565.D2.3	Discuss the ethical and appropriate use of computer devices and examine device usability through several lenses including accessibility, ergonomics, and learnability.
4565.D2.4	Explore the fundamental principles and components of computer networking.
4565.D2.5	Examine the impact of the Internet on society.
4565.D2.6	Investigate the use of artificial intelligence by individuals and society.
4565.D2.7	Investigate innovations in computing, including robotics and the Industrial Internet of Things (IIoT).
Domain	Programming and Development

4565.D3.1	Students connect the process of developing a computing artifact (ex. computer application, web application, operating system, artificial intelligence) with the skills needed during the development process to have a better understanding of what it takes to build a computing artifact.
4565.D3.2	Use the design process to iteratively develop a computing artifact.
4565.D3.3	Demonstrate competencies of programming constructs, including use of data types and variables, control structures (sequencing, looping, branching), and modularity (such as a function).
4565.D3.4	Understand how abstractions hide implementation details when used in everyday objects.
4565.D3.5	Use abstraction to manage program complexity (such as a function to create callable code).
4565.D3.6	Formulate algorithms using programming structures to decompose a complex problem.
4565.D3.7	Assess a program by testing to verify correct behavior.
4565.D3.8	Construct a computing artifact that has a user interface.
4565.D3.9	Produce an artifact that includes rich media (e.g., text, graphics, animations, or video).
4565.D3.10	Illustrate knowledge of good programming practice including the use of conventional standards and comments.
Domain	Data
4565.D4.1	Students describe the types of data and how it is created, stored, and used by computers.
4565.D4.2	Understand how computers represent data, including text, sound, images, and numbers.
4565.D4.3	Create data visualizations, models, and simulations using data collected using computational tools such as surveys.
4565.D4.4	Evaluate data to better understand the world.
4565.D4.5	Explore the relationship between information and data.
Domain	Security and Privacy
4565.D5.1	Examine the dynamic between privacy and security.
4565.D5.2	Explain the privacy concerns related to the collection and generation of data through implicit and explicit processes.
4565.D5.3	Evaluate the social and emotional implications of privacy in the context of safety, law, and ethics.
4565.D5.4	Give examples to illustrate how sensitive data can be affected by malware and other attacks.
4565.D5.5	Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical implications.
4565.D5.6	Discuss the laws surrounding intellectual property.
4565.D5.7	Examine tradeoffs in computing technologies through current events related to broad ideas including privacy, communication, and automation (i.e. driverless cars can increase convenience and reduce accidents, but they are susceptible to hacking. The emerging industry will reduce the number of taxi and ride-share drivers but will create software engineering and cybersecurity jobs).