TYPE COURSE TITLE HERE

Course Compendium

Credits: 5

Grades: 9, 10, 11, 12

This course fulfills the graduation requirement for career education/practical arts.

This introduction to computer science curriculum teaches the foundations of computer science and basic programming, with an emphasis on helping students develop logical thinking and problem-solving skills. The Intro to Computer Science in JavaScript course is designed for complete beginners with no previous background in computer science. Topics covered include graphics, animation and games, data structures, and more.

UNITS OF STUDY*

Unit 1: Digital Information and the Internet
Unit 2: Tracing your Digital Footprint and Cybersecurity
Unit 3: Web Design
Unit 4: Introduction to Programming with Karel the Dog
Unit 5: JavaScript Graphics
Unit 6: JavaScript Control Structures
Unit 7: JavaScript Functions and Parameters
Unit 8: JavaScript Animation and Games
Unit 9: Coding in the Wild

INTERDISCIPLINARY CONNECTIONS

NJSLS Companion Standards Grades 9-12 (Reading & Writing in Science & Technical Subjects)

RST.9-10.2. Determine the central ideas, themes, or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
RST.9-10.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
RST.9-10.5. Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
RST.11-12.2. Determine the central ideas, themes, or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
RST.11-12.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

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RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

WHST.9-10.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

Science Connections

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS -ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

21st Century Life and Careers

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills
CRP4. Communicate clearly and effectively and with reason.
CRP6. Demonstrate creativity and innovation.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence

9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.
9.3.ST.5 Demonstrate an understanding of the breadth of career opportunities and means to those opportunities in each of the Science, Technology, Engineering & Mathematics Career Pathways.

9.3.ST-ET.1 Use STEM concepts and processes to solve problems involving design and/or production.

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9.3.ST-ET.2 Display and communicate STEM information.
9.3.ST-ET.4 Apply the elements of the design process.
9.3.ST-ET.5 Apply the knowledge learned in STEM to solve problems.
9.3.ST-ET.6 Apply the knowledge learned in the study of STEM to provide solutions to human and societal problems in an ethical and legal manner.

9.3.ST-SM.1 Apply science and mathematics to provide results, answers and algorithms for engineering and technological activities.
9.3.ST-SM.2 Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.

Technology

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.1 Educational Technology: A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
8.1.12.A.CS1 Understand and use technology systems.
8.1 Educational Technology: B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
8.1.12.B.CS1 Apply existing knowledge to generate new ideas, products, or processes.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which we live
8.2.12.A.1 Propose an innovation to meet future demands supported by an analysis of the potential full costs, benefits, trade-offs and risks, related to the use of the innovation.
8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society
8.2.12.B.2 Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: C. Design: The design process is a systematic approach to solving problems.
8.2.12.C.5 Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.

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8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.
8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.

<table>
<tr><th colspan="3">GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS</th></tr>
<tr><th>English Language Learners</th><th>Students Receiving Special Education Services</th><th>Advanced Learners</th></tr>
<tr><td>- Personal glossary
- Text-to-speech
- Extended time
- Simplified / verbal instructions
- Frequent breaks

WIDA Can Do Descriptors for Grade 9-12
WIDA Essential Actions Handbook
FABRIC Paradigm
Wall Township ESL Grading Protocol

*Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs).</td><td>- Small group/One to one
- Additional time
- Review of directions
- Student restates information
- Space for movement or breaks
- Extra visual and verbal cues and prompts
- Preferential seating
- Follow a routine/schedule
- Rest breaks
- Verbal and visual cues regarding directions and staying on task
- Checklists
- Immediate feedback

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

Considerations for Special Education Students 6-12
National Center on Universal Design for Learning - About UDL
UDL Checklist
UDL Key Terms</td><td>- Use of high level academic vocabulary/texts
- Problem-based learning
- Preassess to condense curriculum
- Interest-based research
- Authentic problem-solving
- Homogeneous grouping opportunities
Knowledge and Skill Standards in Gifted Education for All Teachers
Pre-K-Grade 12 Gifted Programming Standards
Gifted Programming Glossary of Terms

Students with 504 Plan

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.</td></tr>
<tr><td colspan="3">At Risk Learners / Differentiation Strategies</td></tr>
<tr><td>Games and Tournaments
Group Investigations
Leveled Rubrics
Personal Agendas
Homogeneous Grouping</td><td>Independent Research & Projects
Multiple Intelligence Options
Project-Based Learning
Varied Supplemental Activities
Varied Journal Prompts</td><td>Jigsaw
Exploration by Interest
Flexible Grouping
Goal-Setting with Students</td></tr>
</table>

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