Roselle Public Schools

Career and Technical Education Curriculum

Computer Science III

Grade 12

Mission

The Roselle Public School District is committed to and will prepare ALL of our students for college, work, and life. We will provide a safe, clean, positive and supportive learning environment in which ALL students can successfully develop socially, emotionally and academically into lifelong learners and responsible, productive citizens. We will continually strengthen and align our curriculum with state, national and international standards that are engaging, rigorous, relevant, and implemented consistently. We will ensure that all students, parents, staff, and community members are respected and informed in our family friendly schools. We will strive to motivate all of our students through various innovative instructional strategies, methods and techniques. Utilizing students' skills, talents, and unique abilities, we will prepare them to meet the demands of an ever changing competitive 21st Century global society.

Vision

To prepare ALL our students for college, work and life in high achieving Roselle Public Schools.

Core Beliefs

- High Academic Achievement is a priority.
- Continuous improvement is essential.
- Learning is a lifelong process.
- Students, staff, parents and community members are partners in education and all have a personal responsibility in the educational process.
- Every school in Roselle can be a high performing school.
- Curriculum and instruction must foster 21st Century skills.
- Our schools must be clean, safe, orderly, welcoming and nurturing environments where all students and staff can focus on and engage in the process of teaching and learning.
- All children have skills, talents and unique abilities.
- Children are our greatest resource and the key to our global future.
- All children can learn and shall be provided equitable opportunities for a quality, relevant education.
- Preparing our students for college, work and life is a priority.
- Our students deserve and have a right to high quality effective Principals and Teachers.

21st Century Skills

LEARNING & INNOVATION	INFORMATION, MEDIA & TECHNOLOGY SKILLS	LIFE & CAREER SKILLS
Creativity and Innovation □ Think Creatively □ Work Creatively with Others □ Implement Innovations **Critical Thinking and Problem Solving** □ Reason Effectively □ **U**se Systems Thinking □ Make Judgments and Decisions □ Solve Problems **Communication and Collaboration** □ Communicate Clearly □ Collaborate with Others	**Information Literacy** □ Access and /evaluate Information □ Use and Manage Information **Media Literacy** □ Analyze Media □ Create Media Products **Information, Communications and Technology (ICT Literacy)** □ Apply Technology Effectively	**Flexibility and Adaptability** □ Adapt to Change □ Be Flexible **Initiative and Self-Direction** □ Manage Goals and Time □ Work Independently □ Be Self-Directed Learners **Social and Cross-Cultural** □ Interact Effectively with Others □ Work Effectively in Diverse Teams **Productivity and Accountability** □ Manage Projects □ Produce Results **Leadership and Responsibility** □ Guide and Lead Others □ Be Responsible to Others

Career Ready Practices

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

CRP1	Act as a responsible and contributing citizen and employee
CRP2	Apply appropriate academic and technical skills
CRP3	Attend to personal health and financial well-being
CRP4	Communicate clearly and effectively and with reason
CRP5	Consider the environmental, social and economic impacts of decisions
CRP6	Demonstrate creativity and innovation
CRP7	Employ valid and reliable research strategies
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them
CRP9	Model integrity, ethical leadership and effective management
CRP10	Plan education and career paths aligned to personal goals
CRP11	Use technology to enhance productivity
CRP12	Work productively in teams while using cultural global competence

Standards	
Career Cluster	**INFORMATION TECHNOLOGY (IT)**
9.3.IT. 1	Demonstrate effective professional communication skills and practices that enable positive customer relationships.
9.3.IT. 2	Use product or service design processes and guidelines to produce quality information technology (IT) product or service
9.3.IT. 3	Demonstrate the use of cross-functional teams in achieving IT project goals.
9.3.IT. 4	Demonstrate positive cyber citizenship by applying industry accepted ethical practices and behaviors.
9.3.IT. 5	Explain the implications of IT on business development
9.3.IT. 6	Describe trends emerging and evolving computer technologies and their influence on IT practices
9.3.IT. 7	Perform standard computer backup and restore procedures to protect IT information
9.3.IT. 8	Recognize and analyze potential IT security threats to develop and maintain security requirements
9.3.IT. 9	Describe quality assurance practices and methods employed in producing and providing IT products and srvices
9.3.IT. 10	Describe the use of computer forensics to prevent and solve information technology crimes and security breaches
9.3.IT. 11	NA
9.3.IT. 12	Demonstrate knowledge of hardware components associated with information systems
9.3.IT. 13	Compare key functions and applications of software and determine maintenance strategies for computer systems.
Pathway	**PROGRAMMING & SOFTWARE DEVELOPMENT (IT-PRG)**
9.3. IT-PRG.1	Analyze customer software needs and requirements
9.3. IT-PRG.2	Demonstrate the use of industry standard strategies and project planning to meet customer specifications.
9.3. IT-PRG.3	Analyze system and software requirements to ensure maximum operating efficiency
9.3. IT-PRG.4	Demonstrate the effective use of software development tools to develop software applications
9.3. IT-PRG.5	Apply an appropriate software development process to design a software application.
9.3. IT-PRG.6	Program a computer application using the appropriate programing language.
9.3. IT-PRG.7	Demonstrate software testing procedures to ensure quality
9.3. IT-PRG.8	Perform quality assurance task as part of the software development cycle
9.3. IT-PRG.9	Perform software maintenance and customer support functions
9.3. IT-PRG.10	Design, create and maintain database

GUIDELINES FOR ADAPTING INSTRUCTIONAL MATERIALS FOR STUDENTS WITH DISABILITIES AND STUDENTS AT RISK

Problem	Adaptation / Strategies
Enlarge Print	
Visual Perception, Visual Skills for Reading Behavior	• Retype materials on primary typewriter • Utilize individual magnifying glasses • Project material on wall using opaque projector • Enlarge font within document
Reduce Distraction on Page	
Visual Perception, Visual Skills in Reading, Spelling, Computation, Behavior, Arithmetic Readiness, Problem Solving	• Reduce problems or items on page • Frame specific items on page • Cover area on page to reduce items
Enlarge Space In Which Student Responds	
Visual Perception, Handwriting, Motor, Behavior	• Provide separate answer sheet with space for response • Provide blackboard/whiteboard for written response
Color Code Material	
Visual Skills in Reading, Reading Comprehension, Spelling, Memory, Perception, Problem Solving, Computation, Behavior	• Color code topic sentence in reading test and supporting sentences in another color • Color code directions, examples, and problems in different colors • Color code math symbols (= + - x) for easy recognition
Utilize Arrows for Directionality	
Visual Perception, Visual Skills in Reading, Spelling, Handwriting, Motor, Perception, Arithmetic Readiness, Computation, Behavior	• Provide arrows as cues for following obstacle course • Utilize arrows to indicate direction of math operations on number line • Provide arrows at top of worksheet or tape on desk as a reminder of left to right progression in reading or writing
Modify Vocabulary	
Reading Comprehension, Inner Language, Receptive Language, Problem Solving, Behavior	• Rewrite directions in workbook • Provide vocabulary list with synonyms or simplified directions • Instructor gives information or directions in simplified terms
Tape Record Material	
Reading Comprehension, Auditory Skills in Reading, Auditory Perception, Receptive Language, Memory, Problem Solving, Behavior, Arithmetic Readiness, Computation	• Record directions for learner to refer to • Record test; verbal or written learner response • Record passage; learner follows written text

I. Course Description

Course name: Computer Science III – Programing

Computer Science III is a full year course for students continuing in the **Academy of Information Technology**. The AoIT set of courses is designed to introduce, develop and reinforce the essential skills in Information Technology that are vital for success in today's world. The main aspect of this third year course is to develop skills in database design, database programming and database management. Another aspect is the introduction to server side programming using **Active Server Pages** and **VBScript**. Current industry standard software and techniques are used.

Students will develop technical, analytical, and business skills that support the pursuit of professional careers and advanced study. Students will develop **SQL** design and coding skills.
Current industry standard software and techniques are used. Microsoft **WORD**, **EXCEL** and **PowerPoint** are used for documentation and presentation tasks. **Hypertext Mark-Up Language**(HTML) and Adobe **FLASH**, **PhotoShop** and **Dreamweaver** are used for web site design and development.
This AoIT course also provides continued development in information technology and reinforces computer literacy skills, the use of business application software, and the use of various text editors and knowledge of Graphical User Interfaces.

Prerequisites:

- Computer Science I
- Computer Science II

Possible jobs in the field	Median wages state	Median wages national
Computer network support specialist	$65.300	$59.100
Computer programmer	$82.200	$74.300
Software developer, applications	$93.700	$90.100
Software developer, systems software	$107.300	$99.000
Web developers	$70.200	$62.500

II. OBJECTIVES

Upon completion of Computer Science III, the students will be able to:

A. Analyze, define and solve a given problem
B. Develop algorithms used in problem solving techniques
C. Identify careers related to Information Technology
D. Discuss current issues relating to Information Technology
E. Understand and practice safety techniques
F. Design documentation using Microsoft **WORD** and **EXCEL**
G. Design presentation materials using Microsoft **PowerPoint**
H. Design web based applications using **Access**
I. Design relational **databases**
J. Design, code, and test **SQL**
K. Design, code and test **ASP** applications using **ASP** and **VBScript**

III. Software, Textbooks and Instructional Materials

A . Software

1. Oracle Application Express
2. Oracle iLearning
3. Adobe Creative Suite 3 - DREAMWEAVER
4. HTML
5. Microsoft Office

    a. WORD
    b. EXCEL
    c. POWERPOINT
    d. ACCESS

6. Internet
7. Microsoft FrontPage
8. Active Server Pages

B. Resources

1. Adobe Dreamweaver CS3 – Comprehensive Concepts and Techniques
Shelly Cashman Series
Gary Shelly, Thomas Cashman, Dolores Wells and Steven Freund
Course Technology - Boston – 2009
ISBN : 14239-1242-X

2. Internet Programming with VBScript and Javascript
Kathleen Kalata
Thompson Course Technology 2001
ISBN : 0-619-01523-3

3. Active Server Pages 3.0
Scott Mitchell and James Atkinson
Sams Publishing 2000
ISBN : 0-672-31863-6

4. E-Commerce programming with ASP
Stephen Walker and Jonathan Levine
Sams Publishing
ISBN : 0-672-31898-9

IV. INSTRUCTIONAL STRATEGIES

Computer Science III encompasses many different types of open-ended problems of a mathematical or business nature. The goal of Computer Science III is to develop computer literacy skills and to introduce and develop web based design and creation skills.
Microsoft Office skills are introduced developed and reinforced and eventually will be used for independent presentations and to solve business problems.

Therefore, all students must demonstrate the following skills:

1. Critical thinking
2. Decision making
3. Software engineering
4. Use of technologies
5. Self-management skills
6. Time-management skills
7. Teamwork

In order to apply these skills, the instructional strategies will incorporate solving a number of case studies. By analyzing these open-ended problems, students apply all of the above skills in great detail. They create a model solution by applying the divide and conquer technique.

V. COURSE OUTLINE

1. Oracle Database Design
    - A. Data Modeling
    - B. Entity Relationship Diagrams
    - C. Relationships
    - D. Identifiers
    - E. Normalization
2. Database Programming
    - A . Introduction to SQL
    - B. SQL Structure
    - C. Functions
    - D. Joins
    - E. Group Functions
    - F. Data Manipulation Language
    - G. Data Definition language
    - H. Transaction Control Language
    - I. Data Control Language
3. DREAMWEAVER
    - A Review of CS3
4. Microsoft Office (3)
    - A. WORD
    - B. EXCEL
    - C. POWERPOINT
5. Microsoft ACCESS
6. Active Server Pages
    - A. Introduction to Action Server Pages
    - B. Introduction to VBScript
    - C. Variables, Functions and Control Structures
    - D . Request / Response
    - E . Files
    - F. Database
7. Computer Literacy
    - A. Storage
    - B. Memory
8. Projects / Presentations
9. Safety
10. Career

VI. EVALUATION, PROFICIENCIES and CCCS

A. Evaluation:

Tests
Quizzes
Labs / projects
Homework / Notebook
Participation

B. Proficiencies:

Upon completion of Computer Science III, the student will be able to:

A . Analyze, define and solve a given problem
B. Develop algorithms used in problem solving
C. Identify careers related to Information Technology
D. Discuss current issues relating to Information Technology
E. Understand and practice safety
F. Design required documentation using Microsoft **WORD** and **EXCEL**
G. Design required presentation materials using Microsoft **PowerPoint**
H. Design business applications using Microsoft **Access**
I. Design Relational Databases
J. Design, code and test **SQL**
K. Design, code and test ASP applications using **ASP** and **VBScript**

C. CCCS

8.1.12.A.1 Construct a spreadsheet, enter data, and use mathematical or logical functions to manipulate data, generate charts and graphs, and interpret the results.
8.1.12.A.2 Produce and edit a multi-page document for a commercial or professional audience using desktop publishing and/or graphics software.
8.1.12.A.4 Create a personalized digital portfolio that contains a résumé, exemplary projects, and activities, which together reflect personal and academic interests, achievements, and career aspirations.
8.1.12.B.1 Design and pilot a digital learning game to demonstrate knowledge and skills related to one or more content areas or a real world situation.
8.1.12.C.1 Develop an innovative solution to a complex, local or global problem or issue in collaboration with peers and experts, and present ideas for feedback in an online community.
8.1.12.D.1 Evaluate policies on unauthorized electronic access (e.g., hacking) and disclosure and on dissemination of personal information.
8.1.12.D.2 Demonstrate appropriate use of copyrights as well as fair use and Creative Commons guidelines.
8.1.12.E.1 Develop a systematic plan of investigation with peers and experts from other countries to produce an innovative solution to a state, national, or worldwide problem or issue.
8.1.12.E.2 Predict the impact on society of unethical use of digital tools, based on research and working with peers and experts in the field.
8.1.12.F.1 Select and use specialized databases for advanced research to solve real-world problems.
8.1.12.F.2 Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs.
8.2.12.C.1 Analyze the ethical impact of a product, system, or environment, worldwide, and report findings in a web-based publication that elicits further comment and analysis.
8.2.12.C.2 Evaluate ethical considerations regarding the sustainability of resources that are used for the design, creation, and maintenance of a chosen product.
8.2.12.C.3 Evaluate the positive and negative impacts in a design by providing a digital overview of a chosen product and suggest potential modifications to address the negative impacts.
8.2.12.D.1 Reverse-engineer a product to assist in designing a more eco-friendly version, using an analysis of trends and data about renewable and sustainable materials to guide your work.
8.2.12.E.1 Use the design process to devise a technological product or system that addresses a global issue, and provide documentation through drawings, data, and materials, taking the relevant cultural perspectives into account throughout the design and development process.
8.2.12.F.1 Determine and use the appropriate application of resources in the design, development, and creation of a technological product or system.

Common Core State Standards Alignment

READING

Key Ideas and Details: CCSS.ELA-LITERACY.RI.11-12.1 - CCSS.ELA-LITERACY.RI.11-12.2 - CCSS.ELA-LITERACY.RI.11-12.3
Craft & Structure: CCSS.ELA-LITERACY.RI.11-12.4 - CCSS.ELA-LITERACY.RI.11-12.5 - CCSS.ELA-LITERACY.RI.11-12.6
Integration of Knowledge and Ideas: CCSS.ELA-LITERACY.RI.11-12.7 - CCSS.ELA-LITERACY.RI.11-12.8

WRITING

Text Types and Purposes: CCSS.ELA-LITERACY.W.11-12.1 - CCSS.ELA-LITERACY.W.11-12.1.A - CCSS.ELA-LITERACY.W.11- - 2.1.B - CCSS.ELA-LITERACY.W.11-12.1.C - CCSS.ELA-LITERACY.W.11-12.1.D - CCSS.ELA-LITERACY.W.11-12.1.E - CCSS.ELA-LITERACY.W.11-12.2 - CCSS.ELA-LITERACY.W.11-12.2.A - CCSS.ELA-LITERACY.W.11-12.2.B - CCSS.ELA-LITERACY.W.11-12.2.C - CCSS.ELA-LITERACY.W.11-12.2.D - CCSS.ELA-LITERACY.W.11-12.2.E - CCSS.ELA-LITERACY.W.11-12.2.F - CCSS.ELA-LITERACY.W.11-12.3 - CCSS.ELA-LITERACY.W.11-12.3.A - CCSS.ELA-LITERACY.W.11-12.3.E
Production and Distribution of Writing: CCSS.ELA-LITERACY.W.11-12.4 - CCSS.ELA-LITERACY.W.11-12.5 - CCSS.ELA-LITERACY.W.11-12.6
Research to Build and Present Knowledge: CCSS.ELA-LITERACY.W.11-12.7 - CCSS.ELA-LITERACY.W.11-12.8 - CCSS.ELA-LITERACY.W.11-12.9

SPEAKING & LISTENING

Comprehension and Collaboration: CCSS.ELA-LITERACY.SL.11-12.1 - CCSS.ELA-LITERACY.SL.11-12.1.A - CCSS.ELA-LITERACY.SL.11-12.1.B - CCSS.ELA-LITERACY.SL.11-12.1.C - CCSS.ELA-LITERACY.SL.11-12.1.D - CCSS.ELA-LITERACY.SL.11-12.2 - CCSS.ELA-LITERACY.SL.11-12.3
Presentation of Knowledge and Ideas: CCSS.ELA-LITERACY.SL.11-12.4 - CCSS.ELA-LITERACY.SL.11-12.5 - CCSS.ELA-LITERACY.SL.11-12.6

LANGUAGE

Conventions of Standard English: CCSS.ELA-LITERACY.L.11-12.1 - CCSS.ELA-LITERACY.L.11-12.1.B - CCSS.ELA-LITERACY.L.11-12.2 - CCSS.ELA-LITERACY.L.11-12.2.B
Knowledge of Language: CCSS.ELA-LITERACY.L.11-12.3
Vocabulary Acquisition and Use: CCSS.ELA-LITERACY.L.11-12.4 - CCSS.ELA-LITERACY.L.11-12.4.C - CCSS.ELA-LITERACY.L.11-12.5 - CCSS.ELA-LITERACY.L.11-12.6

VII. SCOPE and SEQUENCE

Introduced	I
Developed	D
Reinforced	R

Grade 12

DataBase Design	I	D	R
DataBase Programming	I	D	R
Microsoft ACCESS	I	D	
Active Server Pages	I	D	
Dreamweaver		R	
Microsoft Office		R	
Computer Literacy	I	D	
Projects / Presentations		R	
Safety		R	
Career		R	