Information and Communication Technologies Sector
Pathways/Courses for School Year 2013-14

INFORMATION SUPPORT AND SERVICES PATHWAY

Office Systems and Technologies (Course 4615)
This course is project-based designed to provide students with hands-on use of spreadsheets, word processing and presentation applications while studying computer concepts such as cloud computing and the Internet. The effective use of technology and internet resources are used to further develop teamwork, communication and presentation skills in a variety of formats. These applications may be taught through a wide variety of units of study which may include topics like: Internet Safety, Career Exploration, and Financial Literacy. Course titles may also include: Computer Technology; Business Computer Information Systems; Computer Applications.

Computer Repair and Support (Course 4633)
This course will explore workplace safety, customer relations, and help ticket documentation. Students will also learn various computer operating systems such as Linux, computer maintenance, electrical measurements and energy conservation, basic troubleshooting, and virus protection. Students will also be introduced to various devices such as tablets, laptops and mobile devices; and, network architecture and internet technologies, as well as careers in the IT industry. This course will prepare students for internships working at a helpdesk, or in a computer repair shop. Course titles may also include: Information Technology Essentials; Computer Service Technology.

Digital Literacy (Course 4632)
This course teaches students how to use a computer or communication device to effectively and critically navigate, evaluate and create information using a range of information technologies and sources available from the Internet. Students recognize and use the power of digital technologies to manipulate and transform digital media, to distribute it pervasively, and to easily adapt them to new forms. Students enhance their ability to read for knowledge, write coherently, and think critically about the written word. Course titles may also include: Internet Safety.

NETWORKING PATHWAY

Network Engineering (Course 4604)
This course prepares students for jobs as network technicians and helps them develop skills required for computer technicians provides a basic overview of routing and remote access, addressing, and security. It also familiarizes students with servers that provide email services, web space, and authenticated access. Students learn about the soft skills required for help desk and customer service positions, and help them prepare for industry certification exams. Students perform a great deal of hands-on work on routers, switches, and firewalls as they

learn to design, build, and maintain data networks using with some of the most powerful enterprise network technologies of the day. The course covers some of the most powerful technologies used on enterprise networks including wireless networks, virtual LANs (VLANs), Spanning-Tree Protocol (STP), traffic management with access control lists (ACLs), dynamic routing, and wide area network (WAN) technologies. Course titles may also include: Network Design, Installation & Engineering; Introduction to Networking.

Network Security (Course 4646)

This course provides an in-depth study of Network Security fundamentals and provides a comprehensive overview of network security, including computer forensics. Students will gain the knowledge and skills required to identify risk and participate in risk mitigation activities; provide infrastructure, application, operational, and information security; apply security controls to maintain confidentiality, integrity, and availability; identify appropriate technologies and products; and operate with an awareness of applicable policies, laws, and regulations.

SOFTWARE AND SYSTEMS DEVELOPMENT PATHWAY

Computer Programming for Solving Applied Problems (Course 4619)

This course provides students with the fundamental knowledge of computer programming for solving applied problems. Students learn how a computer works and structured programming for software development. The topics include programming constructs, data types and declaration of variables, expressions and operators, selection statements, repetition, flowcharts for algorithm development, functions, arrays, and processing data files. Considerable attention is devoted to program design, task decomposition, testing, debugging, and software reuse. Students write computer programs with graphical plotting in an integrated development environment. Through problem-based projects, students develop critical thinking, problem solving, computational thinking, effective communication, and team work skills. The emphasis of the course is on algorithm development and computer programming for solving applied problems in science, technology, engineering and math.

Exploring Computer Science (Course 4634)

This course provides students with foundational knowledge of computer science. Students will explore topics of human computer interaction, problem solving, web design, computer programming, data modeling, and robotics. Throughout the course, students will understand the algorithmic underpinnings of computer applications and gain technical expertise using computational tools. Course titles may also include: Introduction to Computer Science A; Computer Principles; Introduction to Information and Communication Technologies; Introduction to Computer Technologies.

AP Computer Science A (Course 2470)

This course emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development, and is meant to be the equivalent of a first-semester college-level course in computer science. Students apply discrete programming skills

to make a video game, a virtual pet, a sound editor, and will explore careers in programming, including wireless applications for iPhone, Android, and iPad apps. This course follows the College Board's AP Computer Science curriculum, so that students can take the AP Computer Science A exam in the spring.

Web Site Development (Course 4605)
In this course students learn to develop Web sites using Hypertext Markup Language version 5 (HTML5) and Cascading Style Sheets (CSS). Students learn to write code manually, use graphical user interface (GUI) authoring tools and how to insert images, create hyperlinks, add tables, forms, video, and audio to Web pages. Students also learn how to use HTML5 and JavaScript Application Programming Interfaces (APIs) to extend the functionality of Web pages, such as geo-location, drag-and-drop, canvas, and offline Web applications. Other topics include validating your HTML code, recognizing the importance of search engine optimization (SEO), using style sheets extensively to format Web page content, and implementing fundamental design concepts. Throughout the course, students learn how Web sites are developed as managed projects and identify e-commerce solutions and relate Web site development to business goals. Course titles may also include: Website Design and Development; Essential Web Skills.

Robotic Technologies (Course 4647)
This course introduces students to the working principles and foundational knowledge of robotics. Students learn to control a single robot and multiple robots by graphical user interface, pose teaching, and object-oriented programs. Students write robotics programs to perform various tasks based on the sensory information of the robot. Through hands-on problem-based projects, students develop critical thinking, problem solving, effective communication, and team work skills. Robots are used as platforms to engage students in collaboratively learning science, technology, engineering, and math. This course emphasizes hands-on robotics activities with a concentration on algorithm development for solving problems in math and science.

Social and New Media Technologies (Course 4648)
This course explores social networking, consumer behavior; practices of advertising and foundation, processes and goals of marketing in relation to internet and social media tools such as Twitter, Facebook, websites, email, Moodle, blogging, mobile, etc. This course will prepare students for internships in a business setting. Course titles may also include: 21st Century Communications.

Multimedia and Animation (Course 4636)
This course explores the integration of digital media including computer graphics, video production, audio production, and animation. Students work on Multimedia projects from concept (content gathering/research) to project completion (authoring/transmission) and focus on the media needed by small and large companies for marketing and corporate communication purposes. Students develop and demonstrate skill through creation of multimedia productions and presentations on venues such as in portfolios, web productions,

and live presentations. This course prepares students to work in teams and deploy projects for community organizations and businesses. Course titles may also include: Multimedia I, Business Information Multimedia Management; Electronic Media.

3D Media Design 1 (Course 4607)

Students learn to code and test animations; implement standard graphics programming techniques for object movement that mimic the laws of physics; know and understand the linear and higher-order algebraic equations underlying the paths of moving objects; know and understand the 2-D and 3-D mathematics underpinning the four spatial transformations: translation, rotation, reflection and scaling; implement effective graphics and graphical user interfaces; design and implement effective event-handling strategies for internal events and for input from keyboard, mouse and other input devices; incorporate digital and multimedia effects programmatically; design algorithm solutions; code, execute, test and debug components; develop programs using abstract data types and object-oriented programs; create structured programs in one or more languages using conditional control structures, methods (procedures, functions), parameters, variables, iteration, recursion and file input/output methods.

Graphic Communications (Course 4635)

This instructional provides students with an understanding and appreciation for graphic design and advertising applications. The historical framework of graphic design and an analysis of visual communication problems are covered. Design principles and effective visual communication techniques are explored by combining digital text and images in various hands-on projects that are displayed on the internet and on mobile devices using industry software. Students learn to capture images and develop skills of camera operation, lens choice, depth of field and motion considerations and lighting. Students develop critique skills based on the application of the principles of design. Course titles may also include: Photography.

Computer Graphics and Media Technology (Course 4606)

This course provides students with the opportunity to explore the capability of the computer to produce visual imagery and to apply graphic techniques to various fields, such as advertising, TV/Video and architecture. This course may emphasize the development of digitally generated or computer enhanced media. Typical topics include modeling, simulation, animation and image retouching.

Database Design and SQL Programming (Course 4631)

This two-part course teaches data modeling and Structured Query Language (SQL). In the database design curriculum, students learn to analyze complex business scenarios and create a data model, a conceptual representation of an organization's information. In the database programming with SQL curriculum, students implement their database design by creating a physical database using SQL, the industry-standard database programming language. Upon completion of this course, students have the opportunity to take an exam to earn the industry certification Oracle Database SQL Certified Expert.

<div align="center">**GAMES AND SIMULATIONS PATHWAY**</div>

Computer Programming and Game Design (Course 4616)
This course explores the history, art, and science of the game development process through hands on projects using a wide range of software. Students work in teams to design and program their own custom games in class, in both 2D and 3D environments. The course examines 3D modeling, 2D animation, level design, sound effects, player psychology, mathematics for gaming, and game logic/programming.

Game Design and Development (Course 4617)
This course introduces students to the analysis, design, and creation of interactive three dimensional animation and games. This is a hands-on course that begins with an extensive overview of 3-D graphics, explaining the basic components of video game design; modeling, texturing, lighting, animation, and rules of game play. Using industry software, students will complete individual and group projects that require the problem solving and practical application of course competencies to create simple games.