

## Technology Education Curriculum

The philosophy of the Computer Science Department is to prepare students to function capably and ethically in a highly technological and, therefore, ever-changing society. Emphasis is on fundamental principals and applications. A wide variety of software programs are utilized, affording students the skills they need to address their needs successfully today and in the future. Courses are designed to serve students with differing abilities, interests, and goals.

### **600 Introductory Keyboarding** **All Grades .5 credit**

This course is designed for students who do not know how to type or cannot type without looking at their fingers. Emphasis is on learning the keyboard, correct spacing, and punctuation techniques, plus being introduced to the function keys and commands using the latest Microsoft Word 2000. Computer operating techniques, skill development, basic formatting of reports, personal correspondence, and proofreading skills will be introduced. The keyboarding goal will be to attain the minimum speed of 30 words per minute with 5 or fewer errors in 2-minute timings.

### **604 Advanced Keyboarding** **All Grades .5 credit** *Prerequisite: **Keyboarding** or 30 WPM.*

This course is designed for students who can type a minimum of 30 words per minute without looking at their fingers. Emphasis will be on improving speed and accuracy. Advanced formatting of reports requiring title pages, bibliographies, footnotes, etc., will be covered along with more complex merge and table projects. Advanced formatting of business and personal correspondence and memorandums is also covered.

### **611 Computer Applications** **All Grades .5 credit**

This course is designed for students to acquire the knowledge of how to use the following software programs: Microsoft Word, Microsoft Excel and Microsoft PowerPoint. The course is project-based and students will have the opportunity not only to complete course assignments but apply their knowledge and skills to assignments from their other Holy Family Catholic High School classes.

### **612 Computer Applications II** **All Grades .5 credit** *Prerequisite: **Computer Applications***

The material covered in this semester course will enhance the topics and software covered in **Computer Applications**. It is an in-depth coverage of *Microsoft Word, Microsoft Publisher, Microsoft Access, Microsoft Excel, and Microsoft PowerPoint*. The course is project-based, many of which will be completed using the Internet.

### **619 Visual Design and Communication** **All Grades .5 credit**

The goal of this one-semester course is to expose students to visual design concepts including fundamentals of design, design theory and methodology, creative thinking, and basic project management. Students will apply these concepts to practical projects involving publications, basic web design, image and text, and basic visualization techniques, using a variety of current technologies to communicate ideas. Some computer experience is helpful, but not necessary.

### **628 Video Production I** **All Grades .5 credit**

Students in this first-semester course will be exposed to various aspects of video production in a cooperative crew setting in which they will gain hands-on knowledge and develop media skills through in-class, studio and field activities, in addition to live webcasting. Processes covered in class include pre-production planning, shooting, basic lighting techniques, sound, editing, and live production. Students will be exposed both to technical and artistic concerns as well as theories of expression, interpretation, and critical analysis of moving images

628 description continued

throughout our society. Students will be required to perform duties outside of class for Holy Family's web cast FIRE LIVE! This course may be taken for art or technology credit. Identify preference on the class registration form.

### **629 Video Production II**

All Grades

.5 credit

*Prerequisite: Video Production I or permission of instructor.*

This second-semester course builds off the knowledge base students acquire in **Video Production I**, both conceptually and in terms of skill development. Though some projects may be group efforts, **Video II** emphasizes independent inquiry. Students will explore their personal creative vision and expression through a more sophisticated use of cameras, editing tools, sound, and light. Students will also develop a better understanding of the use of moving images through a greater focus on artistic theories and analysis. Students will be required to perform duties outside of class for Holy Family's web cast FIRE LIVE! This course may be taken for art or technology credit. Identify preference on the class registration form.

### **632 Introduction to Programming**

All Grades

.5 credit

*Prerequisite: Successful completion of Algebra I*

This is a one-semester, project-oriented course designed to introduce students to programming. Topics include some of the fundamental concepts behind programming such as binary numbers, program design, conditionals, user interfaces, control structures, graphics, and file-based data storage. Many concepts will be introduced through the design of simple games.

### **639 Internet and Webpage Design**

All Grades

.5 credit

*Prerequisite: Successful completion of Algebra I*

The primary focus of this one-semester class will be on website design, using both web page editing software and direct html coding. Students will design pages utilizing everything from simple text, pictures,

tables, and forms to more advanced elements such as animation, databases, JavaScript, and Adobe's Flash. The course will also look at a variety of other internet technologies such as email and file sharing and the legal, ethical, and financial impact of these technologies.

### **640 Independent Advanced**

**Programming (JAVA)\*\***

All Grades

.5 credit

*Prerequisite: Introduction to Programming or Visual Basic*

This is a one-semester, independent study course that utilizes the JAVA programming language to cover some of the more advanced topics in programming which were only introduced in **Introduction to Programming**. Key among these topics is object oriented programming. Other topics will include the program lifecycle, graphic techniques, user interface design, hardware components, and database programming. Throughout the course, students will be introduced to the typical development cycle and follow a "realistic" case study from preliminary design stage through coding and debugging.

**\*\*Students must meet with the instructor at a designated time each week to assess understanding.**

### **641 AP Computer Science (JAVA)\***

All Grades

.5 credit

*Prerequisite: Advanced Programming*

This second-semester JAVA programming course will continue what was begun in Advanced Programming. Students will spend more time looking at advanced structures and algorithms as well as error handling. They will learn about queues plus trees and their uses for searching and sorting data. This course will prepare students to take the AP Computer Science exam.

\*This course may be offered every other year.

**662 Engineering Graphics I**  
All Grades .5 credit  
*Prerequisite: Algebra I*

This one-semester course introduces students to a brief history of engineering, drafting principles, and Computer Aided Drafting (CAD). Students will complete working, section view, auxiliary view, and multi-view drawings. Students will also learn basic geometry and trigonometry principles. As part of the class requirements, students will complete one design challenge a month.

**663 Engineering Graphics II**  
All Grades .5 credit  
*Prerequisite: Engineering Graphics I*

In this one-semester course, students will work on 3D wireframe and solid modeling drawings. They will calculate gears, threads, and go over tolerances. File management will be applied to assembly drawings as well as be animated and put under stress analysis. Once a month, students will complete a design challenge.

**668 Architecture I**  
10<sup>th</sup> – 12<sup>th</sup> Grades .5 credit  
*Prerequisite: Engineering Graphics I*

In this one-semester course, students will study the design aspects and history of architecture. They will learn how to use Autodesk Architecture and Revit software. While learning the software, students will complete preliminary sketches, elevations, sections, floor plans, plot layouts and detailed drawings. As an application of the skills they learn in class, students are required to participate in Habitat for Humanity by working on a house in the area.

**669 Architecture II**  
10<sup>th</sup> – 12<sup>th</sup> Grades .5 credit  
*Prerequisite: Architecture I*

In this one-semester course, students will build on the skills and knowledge they learned in **Architecture I**. Each student will design, draw, and build a scale model of a home. During the course, students will research new technology and practices that make the housing development ecofriendly. Students are required to participate in Habitat for Humanity and the Parade of Homes.

**670 Introduction to Robotics**  
10<sup>th</sup> – 12<sup>th</sup> Grades .5 credit  
*Prerequisite: Engineering Graphics II*

This one semester course will use a hands-on approach to introduce the basic concepts of robotics, focusing on programming, sensors, gears, mechanical devices, 3D design applications, and usage. The class will explore the ethical and moral implications of robot usage by going over case studies and writing a paper. Course information will be tied to lab experiments; students will work in teams to build and test increasingly more complex LEGO-based robots, culminating in a semester robot final.

**671 Robotics 2**  
.5 credit

*Prerequisite: Introduction to Robotics*

During this semester course, students will be using a variety of materials to construct a complex robot. Different programming languages will be applied to run the robot autonomously and by remote. Students will be required to design and document the construction of their robots on the computer. Completed robots will compete in the FIRST Tech Challenge (FTC) which is held outside of the school day. All students are required to attend each competition.