Battlefield High School
Information Technology Specialty Program

Course Descriptions
Interactive Media Course Descriptions

ADVANCED PLACEMENT STUDIO ART (DRAWING) #915060
Grades: 9-12
Prerequisite: Completion of Art I and II with a "B" or better. Teacher recommendation. Recommend completion of Portfolio Prep prior to AP Art.
Weighted: Yes
The Advanced Placement studio studies are intended for the highly motivated students committed to serious study in art. Students should have completed Art I and II and have an art teacher recommendation for this course. This portfolio is intended to address a very broad interpretation of drawing issues and media. The AP Drawing portfolio is comprised of 3 sections: Quality (5 actual works of art), Concentration (12 slides which reflect a series of art around a visual concept in drawing) and Breadth (12 slides that demonstrate a variety of concepts, media, and approaches). Actual works of art and slides are submitted for AP Examination review.

ADVANCED PLACEMENT STUDIO ART (2-D DESIGN) #914860
Grades: 9-12
Weighted: Yes
Prerequisite: Completion of Art I and II with a "B" or better, or teacher recommendation. Recommend completion of Portfolio Prep prior to AP Art
The Advanced Placement studio studies are intended for the highly motivated students committed to serious study in art. Students should have completed Art I and II and have an art teacher recommendation for this course. This portfolio is intended to address a very broad interpretation of two-dimensional (2-D) design issues. This type of design involves purposeful decision-making about how the use of the elements and principles of art work in an integral way. This portfolio is comprised of 3 sections: Quality (5 actual works of art), Concentration (12 slides which reflect a series of art around a visual concept in 2-D Design) and Breadth (12 slides that demonstrate a wide variety of concepts, media and approaches.) Actual works of art and slides are submitted for AP Examination review.

ART PORTFOLIO PREPARATION
Grades: 11-12
Prerequisite: Completion of IT Graphic Design and Art II or approval from department chairperson
The course is intended for highly motivated students committed to serious study in art. The studio will focus on the student’s individual artistic talents. The portfolio, compiled by the student, will demonstrate a variety of experiences in the formal, technical, and expressive means. This course is highly recommend for juniors considering AP Art their senior year.

IT COMPUTER GRAPHICS I #918000
Grades: 10-12
Prerequisite: Successful completion of IT Graphic Design with a “B” or better and a background in computer applications is recommended, and teacher recommendation
This course prepares students for entry-level computer graphics and multimedia as well as entry-level career opportunities in the computer graphics industry. The course of study includes learning the foundations of computer graphics, photo design, and production as well as taking images from concept to completion in print and on the web. Tools such as digital cameras and scanners are used to import art and graphics into the computer. Students’ artistic abilities will be enhanced as they explore Adobe’s Photoshop software to complete the design and production process.

IT COMPUTER GRAPHICS II #918100
Grades: 11-12
Prerequisite: Successful completion of IT Computer Graphics I with a “B” or better, and teacher recommendation
IT Computer Graphics II is a continuation of IT Computer Graphics I. This course of study will introduce students to Adobe Illustrator as well as provide advanced image editing and manipulation techniques with Adobe Photoshop. Students will also be introduced to page layout processes using Adobe InDesign. The emphasis will be on the study of aesthetics and on the production of original computer imagery. This course will enable modeling for print reproduction rather than web production. Students will work on individual as well as team projects. Students will be required to produce professional portfolios.
IT GRAPHIC DESIGN #915320
Grades: 9-12
Prerequisite: Acceptance into the IT Program
IT Graphic Design is designed to train students to become visual communicators. Students will apply the knowledge and understanding of the elements and principles of art through various media, techniques, and processes to solve problems in visual communications. A variety of 2-D and 3-D media will be used. Students will explore technical aspects of layout, typography, illustration, design, and color psychology using traditional graphic tools. Students will learn about the ethical issues in the commercial field, management of time to meet deadlines, working in a team, and expressing and defending their ideas. Also, students will study the history and cultural impact of visual communications. Works generated will be the basis for beginning a Graphics Art Portfolio.

IT MULTIMEDIA SOFTWARE DESIGN AND DEVELOPMENT I #918001
Grades: 11-12
Prerequisite: Computer Graphics I, with a “B” average, and teacher recommendation
Multimedia prepares students for the challenging world of information design, multimedia and web-based development and management. The processes and tools that address these aims include basic HTML, Adobe Dreamweaver and Adobe Flash. Computer based multimedia combines all the facets of communication into an interactive product. The ethical issues of copyright laws and fair use issues will be emphasized. Students will work individually and in teams to complete the project.

PHOTOGRAPHY I #919020
Grades: 10-12
The study of 35 mm print photography focusing on darkroom development will be introduced. Advanced studies of digital photography using cameras, scanners, and photo editing software will be explored. Students will examine through the camera lens how the elements of art and principles of design contribute to effective compositions that communicate a clear message. Students will compare/contrast the history of photography and digital photography. Ethical issues concerning photographic imagery will be explored. Students will produce a portfolio containing both 35 mm and digital photographs to be used in multimedia classes. This course is designed for interactive media students seeking advanced IT certificate.

PHOTOGRAPHY 2 #919120
Grades: 11-12
Prerequisite: Photography I
Students will expand photography skills using 35mm cameras. Emphasis will be placed on the study of personal expression and development of creativity. Advanced camera problems and darkroom techniques will be studied through a variety of assignments. The history of photography will be offered through the study of major photographers, photographic imagery, the use of photography for artistic communication, and the major themes used by photographers. Ethical issues concerning photographic imagery will be explored. Students will also explore digital cameras and scanners to create photographic compositions. Students will produce a portfolio containing both 35mm and digital photographs reflecting a series of works organized around a compelling visual concept or concentration.
Information Technology Course Descriptions

Programming

ADVANCED COMPUTER MATHEMATICS (Java) # 318400
Grades: 9-12  Weighted: 0.5  Prerequisite: Completion of Geometry
Advanced Computer Mathematics has a focus to provide the student with a conceptual background in computer science. Topics include computer architecture, data representation, operating systems, computing systems in society, and software development. Students will implement the major stages of software development using a high level language. Topics will include loops, selections, and arrays. This advanced course covers all topics in the regular Computer Mathematics class as well as others.

ADVANCED PLACEMENT COMPUTER SCIENCE A (Java) #318560
Grades: 10-12  Weighted: 1.0  Prerequisite: Geometry and teacher recommendation
The focus of this course is to provide students with a conceptual background in computer science. The major emphasis is on programming methodology, algorithms, and non-dynamic data structure in the JAVA language. This course prepares a student for advanced placement in computer science by means of the Advanced Placement Examination Level A in Computer Science of the College Entrance Board. This course also serves as a prerequisite for Computer Science AB.

DATA STRUCTURES AND ALGORITHMS
Grades: 11-12  Weighted: 1.0  Prerequisite: Algebra II and Advanced Placement Computer Science A
Computer Science AB extends the topics of AP Computer Science A and provides a more formal and more in-depth study of algorithms, data structures, and data abstraction. Binary trees, recursive data structures and dynamically allocated structures are fundamental to Computer Science AB.

ADVANCED COMPUTER STUDIES
Grades: 12  Prerequisite: Completed Computer Science AB
This course is the introduction to high performance computational concepts utilizing telecommunication and informational technologies. The course will provide mechanisms for learner-centered, collaborative environments where the students and teacher will engage in dynamic modeling processes in a variety of areas ranging from the sciences to humanities. The course emphasizes real-world problems, hands-on activities, and discovery learning that will facilitate an environment for constructive learning. The students will be expected to complete a year-long research project.

IT PROGRAMMING - Dual Enrolled #664085
Grades: 11-12  Weighted: 0.5  Prerequisite: Enrolled in IT Program and the student must qualify for dual enrollment
IT programming introduces students to Systems Design, cyber security and a selected programming environment. Emphasis is placed on the programming process starting from system design to program completion. Current software and programming languages are taught.

Dual Enrollment is required. Dual enrolled course ITP 100.
The following requirements must be met to be dual enrolled:
Pass the NOVA placement test for English and math or
Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT and a 500 on the math or have pass the English and math NOVA placement tests.
IT Fundamentals

INFORMATION TECHNOLOGY FUNDAMENTALS #667020

Grades: 9-10  Prerequisite: Enrolled in IT Program

Information Technology Fundamentals introduces the essential skills needed for students to pursue specialized programs leading to technical and professional careers and certifications in the IT Industry. Students have an opportunity to investigate career opportunities in four major IT areas: Information Services and Support, Network Systems, Programming and Software Development, and Interactive Media. Students explore ethical issues related to computers and Internet technology and develop teamwork and communication skills that will enhance employability.

Database

IT ADVANCED DATABASE DESIGN AND MANAGEMENT (Oracle) - Dual Enrolled #666280

Grade: 12
Prerequisite: Database Design and Management. Teacher Recommendation.
Weighted: 1.0

Web-based technologies used throughout industry, including interactive web sites, accounting programs, research tools, search engines, e-learning environments, email managers, and numerous other applications, depend upon relational databases. PL/SQL, an extension of the SQL programming language, provides additional database functionality through variables, constants, conditional statements, and interactive controls. Students enhance their relational database design and management skills by learning to write PL/SQL code that includes anonymous block, sub programs, built-in functions, control structures, procedures, and triggers, all within a browser-based programming environment. In addition, fully functional Web-based applications are created through the use of HTML DB.

**Dual Enrollment is required. Dual enrolled course ITD 210 and ITN 100**

Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.

IT DATABASE DESIGN AND MANAGEMENT (Oracle) - Dual Enrolled #666080

Grades: 10-12
Prerequisite: Enrolled in IT Program and the student must qualify for dual enrollment. Teacher Recommendation.
Weighted: 1.0

This first-year course includes database design and SQL programming. Students study database fundamentals to include database development, modeling, design, and normalization. In addition, students are introduced to database programming. Students gain the skills and knowledge needed to use features of database software and programming to manage and control access to data. Students will prepare for the first of two certification exams.

**Dual Enrollment is required. Dual enrolled courses ITD 260 and ITD 132.**

The following requirements must be met to be dual enrolled:

- Pass the NOVA placement test for English or
- Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.

Sophomores may only take the class if they are deemed highly qualified: 3.5 GPA, and pass the NOVA placement tests in English and Math.
Web Technologies

**IT WEB TECHNOLOGIES – Dual Enrolled #663085**

*Grades 10-12*

*Prerequisite: Enrolled in IT Program*

*Dual Enrolled: Yes  Weighted: 0.5*

Students will develop an in-depth understanding of the Internet and essential Web page development skills using Extensible HTML, and incorporating images, hyperlinks, tables, forms and frames. Students will learn to write code manually, as well as use GUI authoring tools. Industry certification competencies will be used for this course.

**Dual enrolled courses TBD.**

The following requirements must be met to be dual enrolled:

Pass the NOVA placement test for English or Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.

**IT ADVANCED WEB TECHNOLOGIES – Dual Enrolled#663180**

*Grades: 11-12*

*Prerequisite: IT Web Technologies*

Students will complete the CIW Associates Certification by starting the year with the Network Technologies Associate course. This portion of the course dual enrolls to ITN 100. Students will then engage in the Web Site Development Process using HTML, XHTML, Dynamic HTML, XML, Serverside technologies, Java applets, frames, metadata and Cascading Style Sheets. This portion of the course dual enrolls with ITD210. Reading and hands on work is required for this course. Industry certification competencies will be used for the course.

**Dual Enrollment is required. Dual enrolled course ITD210/ITN100.**

The following requirements must be met to be dual enrolled:

Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.

Networking

**COMPUTER NETWORKING HARDWARE OPERATIONS I #854267**

**COMPUTER NETWORKING HARDWARE OPERATIONS I- Dual Enrolled #854281**

*Grade: 10-12  Semester I  Prerequisite: Algebra I, IT Fundamentals, or Advanced Computer Math, “A” or “B” and teacher recommendation*

*Credits: 1/2  Weighted: 1.0  Dual Enrolled: Yes*

This course teaches students the skills needed to obtain entry-level home network installer jobs. It also helps students develop some of the skills needed to become network technicians, computer technicians, cable installers, and help-desk technicians. It provides a hands-on introduction to networking and the Internet, using tools and hardware commonly found in home and small business environments. Instructors are encouraged to facilitate field trips and outside-the-classroom learning experiences. Labs include PC installation, Internet connectivity, wireless connectivity, file and print sharing and installation of game consoles, scanners, and cameras.

**Dual Enrollment is optional. Dual enrolled ITN 154**

The following requirements must be met to be dual enrolled:

Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.
COMPUTER NETWORKING HARDWARE OPERATIONS II  #854367

Grade: 10-12  Semester II
Prerequisite: Computer Networking Hardware Operations I  Credits: 1/2
Weighted: 1.0  
Dual Enrolled: Yes

This course prepares students for jobs as network technicians and helps them develop additional skills required for computer technicians and help desk technicians. It 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 the final chapter helps them prepare for the CCENT certification exam. Network monitoring and basic troubleshooting are taught in context.

Dual Enrollment is optional. Dual enrolled course ITN 155
The following requirements must be met to be dual enrolled:
Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.

COMPUTER NETWORKING HARDWARE OPERATIONS III  #854467

Grade: 12; Semester I
Prerequisite: Computer Networking Hardware Operations II  Credits: 1/2
Weighted: 1.0  
Dual Enrolled: Yes

This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephone requirements, and security. It also introduces advanced routing protocols such as Enhance Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises, including configuration, installation, and troubleshooting, reinforce student learning.

Dual Enrollment is optional. Dual enrolled course ITN 156
The following requirements must be met to be dual enrolled:
Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.

COMPUTER NETWORKING HARDWARE OPERATIONS IV  #854567

Grade: 12; Semester II
Prerequisite: Computer Networking Hardware Operations III  Credits: 1/2 Weighted: 1.0  
Dual Enrolled: Yes

This course introduces students to network design processes using two examples: a large stadium enterprise network and a medium-sized film company network. Students follow a standard design process to expand and upgrade each network, which includes requirements gathering, proof-of-concept, and project management. Lifecycle services, including upgrades, competitive analyses, and system integration, are presented in the context of pre-sale support. In addition to the Packet Tracer and lab exercises found in the previous courses, there are many pen-and-paper and role-playing exercises that students complete while developing their network upgrade proposals.

Dual Enrollment is optional. Dual enrolled course ITN 157
Have a 390 or higher on the Evidence-Based Reading & Writing of the PSAT or pass the NOVA placement test.
Engineering

Engineering Exploration / Robotics I #845020
Grades: 9-12
Prerequisite: Algebra I
This course provides an orientation to the careers and challenges of engineering. Students are actively involved in hands-on activities in engineering graphics, machining, air power, electronics, materials testing, robotics, and computer technology. Through these activities students learn to solve problems by applying math and science principles. Students communicate information through seminars, technical reports and sharing ideas in group activities.

There is a $150 course fee required of all students. Students may spend time after school building a robot.
The students are expected to participate in competitions, which are typically 2-3 Saturdays.

Engineering Analysis and Applications / Robotics II #845100
Grades: 11-12
Prerequisite: Challenges of Engineering I/ Robotics
To learn the applications and design process of engineering, students form engineering teams and select a group design problem. Each team uses communications, graphics, mathematics, and community resources to solve problems. Each team learns appropriate information in order to complete a project. Projects may be models, systems, or products that creatively solve an engineering problem.

There is a $150 course fee required of all students. Students may spend time after school building a robot.
The students are expected to participate in competitions, which are typically 2-3 Saturdays.

Calculus

ADVANCED PLACEMENT CALCULUS AB #317760
Grades: 11-12
Prerequisite: Functions/ Trigonometry or Functions/Analytic Geometry and teacher recommendation
Weighted: 1.0
Advanced Placement Calculus AB explores the topics of limits/ continuity, derivatives, and integrals. These ideas are examined using a multi-layered approach including the verbal, numerical, analytical, and graphical analysis of polynomial, rational, trigonometric, exponential, and logarithmic functions and their inverses. The student will be expected to relate the connections among these approaches. Students will also be required to synthesize knowledge of the topics of the course to solve applications that model physical, social and/or economic situations. These applications emphasize derivatives as rates of change, local linear approximations, optimizations and curve analysis, and integrals as Riemann sums, area of regions, volume of solids with known cross sections, average value of functions, and rectilinear motions. As mandated by the College Board, graphing calculators will be required.

ADVANCED PLACEMENT CALCULUS BC #317761
Grades: 11-12
Prerequisite: Functions/Analytic Geometry and teacher recommendation
Weighted: 1.0
Advanced Placement Calculus BC is intended for students who have a thorough knowledge of analytic geometry and elementary functions. Although all of the elements of the Advanced Placement Calculus AB course are included, this course provides a more rigorous treatment of these introductory calculus topics. The course also includes the development of the additional topics required by the College Entrance Examination Board in its syllabus for Advanced Placement Calculus BC. Among these are parametric, polar, and vector functions; the rigorous definition of limit; advanced integration techniques; Simpson’s Rule; length of curves; improper integrals; Hooke’s Law; and the study of sequences and series. The use of the graphing calculator will be fully integrated into instruction and students will be called upon to confirm and interpret results of problem situations that are solved using available technology.