Val Tech

The Valencia Academy

A California Distinguished School since 1992
Over 75 years of quality education in Orange County

Placentia Yorba Linda Unified School District

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Current edition

Val Tech: Frequently Asked Questions

PLACENTIA-YORBA LINDA UNIFIED SCHOOL DISTRICT

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BUSINESS & COMPUTER SCIENCE

What is Val Tech?

Val Tech is a dynamic technology program that allows students to select an educational path that will enable them to meet their long-term academic or career goals. Depending on their choice of classes, students can graduate with a Val Tech Certificate as well as a high-school diploma geared for admission either to any top-level four-year university (i.e., University of California) or to a California State University. Students can also select classes that prepare them for a career in technology immediately upon their graduation from high school.

Val Tech is designed for highly motivated, academically talented students who value an opportunity to begin preparing now for a rewarding career in technology in the field of the arts, communication, business, computer science, science, or engineering.

Designed for students who have a special interest in and aptitude for technology, Val Tech encourages academic excellence as it prepares students for their future career in the highly technological 21st century.

This booklet is designed to answer some of the frequently asked questions about Val Tech. If you have other questions or would like to speak to someone about the program, please contact one of the people listed on page 25.

Why should students enter the Val Tech Program?

- To earn a Tech Diploma
- To acquire high-level technology skills
- To prepare for college and university technology courses
- To prepare for a specialized technology certificate program
- To satisfy their interest in and to further develop their aptitude for technology

What are the Val Tech entrance requirements?

- Grade of B or better in Algebra 1 (quarters 1 and 2)
- Grade of B or better in GATE or Honors Language Arts (quarters 1 and 2) **OR** a grade of A in regular Language Arts (semesters 1 and 2) **INCLUDING** the CAT-6 Reading and Language scores above the 75 percentile
- Two letters of recommendation from middle-school core teachers

What are Val Tech's established pathways?

Val Tech has established pathways in the following areas:

- Arts & Communication
- Business & Computer Science
- Science & Technology (Engineering)

Two hundred forty (240) credits are needed to graduate with a Val Tech diploma; a minimum of 50 credits must be in technology classes from the prescribed pathways. Those 50 credits must include an internship. Students can schedule this 150-hour, ten-credit internship during the summer between their junior and senior years or during their senior year (within or outside the traditional school day). The internship will culminate in a research project, a reflective essay, and an oral presentation before an interview panel comprised of PYLUSD

personnel and community members. To be eligible for a tech diploma, the Val Tech student must also construct an electronic portfolio and present this to the interview panel.

Every Val Tech student must meet all district graduation requirements. As previously mentioned, students pursuing a tech diploma can also fulfill both University of California and California State University entrance requirements. The Class of 2006 was the first group of Valencia students eligible for a tech diploma.

What does the internship involve?

All internships are unpaid, and the Val Tech Coordinator and/or the Director of Valencia Academy must approve each internship. Students can schedule this 150-hour, ten-credit internship during the summer between their junior and senior years or during their senior year. (Please refer to **What are Val Tech's established pathways?** Pg. 4) Students can make arrangements for their internship in the technology area of their own interest and choosing. Val Tech students may also arrange a qualifying internship at VHS or another local school. The internship will culminate in a research project, a reflective essay, and an oral presentation before an interview panel comprised of PYLUSD personnel and community members. To be eligible for a tech diploma, the Val Tech student must also construct an electronic portfolio and present this to the interview panel. A special seminar conducted during the spring of the junior year (outside of the regular school day) will help prepare students for a successful internship experience. Additionally, during their senior year, students must meet during lunch once a week with the Val Tech Coordinator in order to prepare for their final presentation.

Students learn how to complete an electronic portfolio while enrolled in Computer Technology. See the Val Tech Internship Program (V-TIP) book for specifics.

What other requirements must Val Tech students meet?

Tech students must meet all district graduation requirements. Students pursuing a tech diploma can also fulfill both University of California and California State University entrance requirements. The Class of 2006 was the first class eligible for a tech diploma.

What must students do to successfully complete the Val Tech Program?

- Complete 240 credits with an overall unweighted GPA of 2.5 or better in academic courses (Students whose cumulative GPA fall below a 2.0 at the end of any semester will be placed on probation for one semester. They must raise their cumulative GPA to at least 2.0, or they will be dropped from the Val Tech Program.) Students who are dropped from the program and do not reside in the Valencia High School attendance area may be required to transfer to their home school.

- Complete 50 credits in technology pathway electives with a cumulative GPA of 3.0 or better in those courses

- Attend the electronic portfolio and internship seminar during the spring of their junior year (The Val Tech Coordinator and/or the Director of Valencia Academy must approve the planned internship.)

- Complete the150-hour internship which will culminate in a research project, a reflective essay, and an oral presentation before an interview panel comprised of PYLUSD personnel and community members

- Develop an electronic portfolio
- Meet all district graduation requirements
- Earn acceptable citizenship grades reflecting good behavior. (Receipt of an unsatisfactory grade will result in student being put on probation. Two consecutive unsatisfactory grades may result in a student being dropped from the program. Students who are dropped from the program and do not reside in the Valencia High School attendance area may be required to transfer to their home school.)

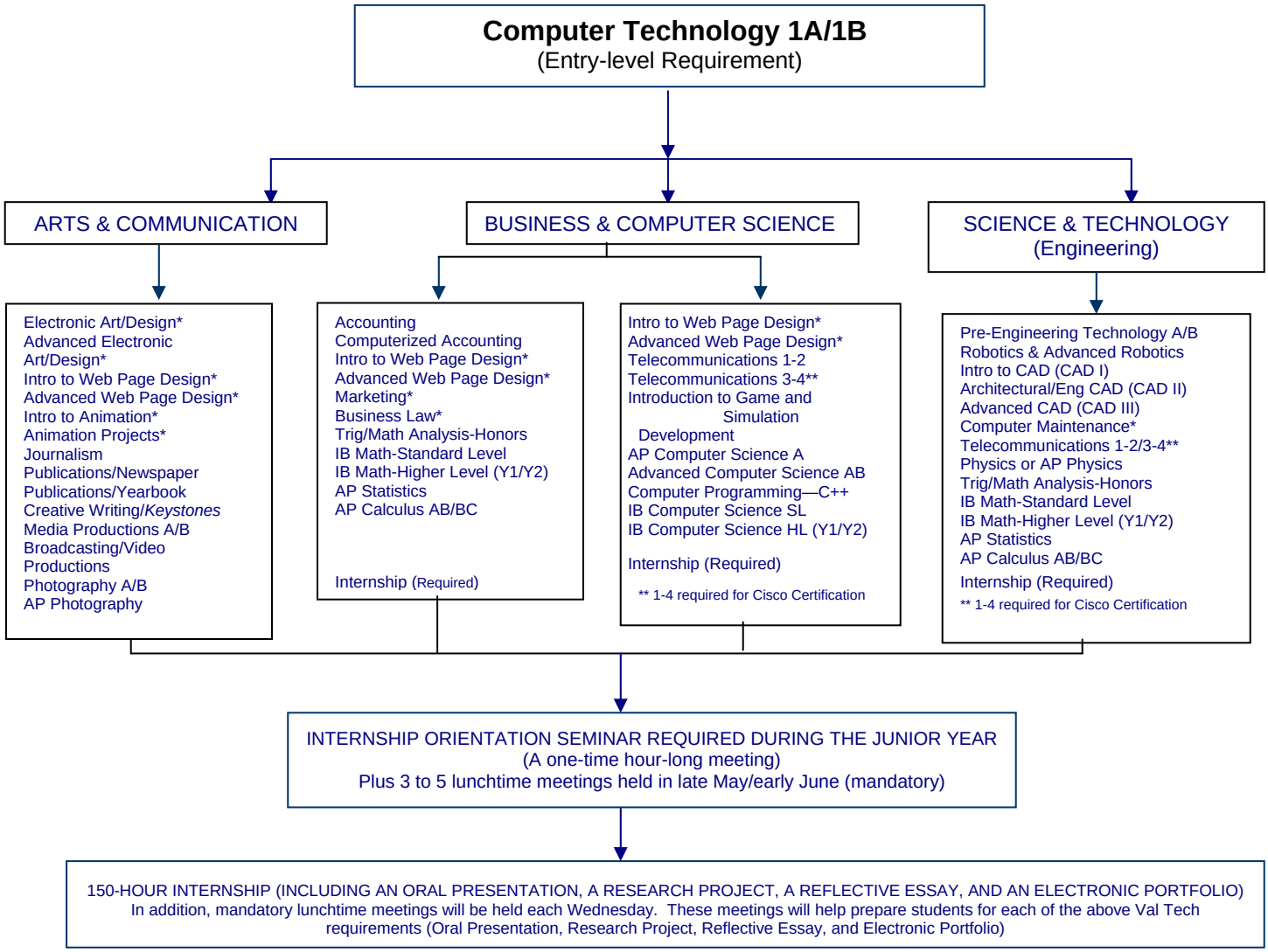
What are the application criteria for Val Tech?

- Complete and submit application. School counselors will provide validation of:
  - ✓ Grade of B or better in Algebra 1 (first and second quarters)
  - ✓ Grade of B in GATE or Honors Language Arts **or** grade of A in regular Language Arts **INCLUDING** CAT-6 Reading and Language scores above the 75 percentile
- Provide two letters of recommendation from middle-school core teachers

What are the benefits of a Val Tech high-school education?

In summary, the benefit of a Val Tech high-school education is a Tech Diploma which provides the student with the opportunity to acquire high-level technology skills, prepare for high-level college and university courses, prepare for specialized technology certificate programs, and sharpen skills and deepen understanding of technology.

VAL TECH TECHNOLOGY PATHWAYS



* Semester Class

Pathways and Selected Courses

Arts and Communication	**Business**	**Computer Science**	**Science & Technology (Engineering)**
• Electronic Art/Design* • Advanced Electronic Art/Design* • Intro to Web Page Design* • Advanced Web Page Design* • Intro to Animation* • Animation Projects* • Journalism • Publications/Newspaper • Publications/Yearbook • Creative Writing/Keystones • Media Productions A/B • Broadcasting/Video Productions • Photography A/B • AP Photography • Internship (Required)	• Accounting • Computerized Accounting • Intro to Web Page Design* • Advanced Web Page Design* • Marketing* • Business Law* • Trig/Math Analysis-Honors • IB Math-Standard Level • IB Math-Higher Level (Y1/Y2) • AP Statistics • AP Calculus AB/BC • Internship (Required)	• Intro to Web Page Design* • Advanced Web Page Design* • Telecommunications 1-2 • Telecommunications 3-4** • Introduction to Game and Simulation Development • AP Computer Science A • Advanced Computer Science AB Computer Programming—C++ • IB Computer Science SL • IB Computer Science HL (Y1/Y2) • Internship (Required) **** 1-4 required for Cisco Certification**	• Pre-Engineering Technology A/B • Robotics & Advanced Robotics • Intro to CAD (CAD I) • Architectural/Eng CAD (CAD II) • Advanced CAD (CAD III) • Computer Maintenance* • Telecommunications 1-2/3-4** • Physics or AP Physics • Trig/Math Analysis-Honors • IB Math-Standard Level • IB Math-Higher Level (Y1/Y2) • AP Statistics • AP Calculus AB/BC • Internship (Required) **** 1-4 required for Cisco Certification**

VAL TECH ELECTIVE COURSES BY GRADE LEVEL

9th Grade Requirement: Computer Technology 1A/1B

10th Grade Electives		11th Grade Electives 10th- Grade Electives Plus:	12th Grade Electives 10th-, and 11th- Grade Electives Plus:
Arts & Communication • Electronic Art/Design • Adv. Electronic Art/Design • Intro to Web Page Design • Adv. Web Page Design • Journalism	• Intro to Animation • Animation Projects • Broadcasting/Video Productions • Media Productions A/B • Photography A/B	**Arts & Communication** • Publications/Newspaper • Publications/Yearbook • Creative Writing/ *Keystones* • Advanced Photography	**Arts & Communication** • A/P Photography
Business • Intro Web Page Design • Adv. Web Page Design • Accounting	• Trig/Math Analysis-H • AP Stats • IB Math-Standard Level	**Business** • Computerized Accounting • AP Calculus AB • IB Math-Standard Level • IB Math-Higher Level (Y1/Y2)	**Business** • AP Calculus BC • IB Math-Higher Level (Y1/Y2)
Computer Science • Intro Web Page Design • Adv. Web Page Design • AP Computer Science A	• Introduction to Game and Simulation Development • Telecommunications 1-2	**Computer Science** • AP Computer Science AB • IB Computer Science SL • Telecommunications 3-4 • Intermediate Comp. Sci.	**Computer Science** • IB Computer Science HL (Y1/Y2)
Science & Technology • Pre-Eng Tech A/B • Computer Maintenance	• Introduction to CAD • Telecommunications 1-2 • Physics or AP Physics	**Science & Technology** • Robotics • CAD II • Telecommunications 3-4	**Science & Technology** • Advanced Robotics • CAD III

12TH Grade Requirement: Internship, Presentation, Essay, and Electronic Portfolio

PYLUSD GRADUATION REQUIREMENTS

9th-Grade	10th-Grade	11th-Grade	12th-Grade
Graduation Requirements: • Language Arts • Math • PE • Science • Foreign Language or Fine Arts • ASCP/ Health	**Graduation Requirements:** • Language Arts • Math • PE • Science • World History • Foreign Language (necessary for 4-year college-bound students)	**Graduation Requirements:** • Language Arts • US History (Another year of Math, Science, Foreign Language are suggested for 4-year college-bound students)	**Graduation Requirements:** • Language Arts • Government • Economics
Val Tech Requirement: Computer Technology 1A/1B	**Val Tech Requirements**: Elective from pathway	**Val Tech Requirements:** • Pre-Internship meeting • Elective(s) from pathway	**Val Tech Requirements:** • 150-hour Internship (V-TIP) • Research project (Completed in LA-4) • Reflective Essay • Presentation (based on internship) • Electronic portfolio • Electives from pathway

VAL TECH REQUIREMENTS BY GRADE LEVEL

9th Grade	10th Grade	11th Grade	12th Grade
Computer Technology 1A/1B	Elective from prescribed pathway (Some sophomore course requirements will be offered zero period and/or seventh period to facilitate pathway continuity.)	Up to four (4) semesters of Tech classes from prescribed pathways.	Up to four (4) semesters of Tech classes, including a 150-hour, ten-credit internship culminating in an presentation, a research project, reflective essay and an electronic portfolio
Health* (zero period or summer school)			
Academic Studies & Career Planning (ASCP)* zero period, summer school, or Directed Study		Internship meeting—required (Orientation to V-TIP Val Tech Internship Program)	

SAMPLE VAL TECH TECHNOLOGY PATHWAY SEQUENCE OF COURSES

Arts and Communication Course 1: Computer Technology 1A/1B Course 2: Web Page Design Course 3: Publication/Yearbook/Newspaper***** Course 4: *Keystones****** Course 5: V-TIP Internship	**Telecommunications** Course 1: Computer Technology 1A/1B Course 2: Computer Maintenance Course 3: Telecommunications 1-2 Course 4: Telecommunications 3-4 Course 5: V-TIP Internship
Electronic Art/Design/Media Production Course 1: Computer Technology 1A/1B Course 2: Electronic Art/Advanced Electronic Art Course 3: Broadcasting/Video Productions Course 4: Media Production* Course 5: V-TIP Internship	**Engineering** Course 1: Computer Technology 1A/1B Course 2: Pre-Engineering A/B***** Course 3: Robotics or AP Statistics* Course 4: Physics* or AP Physics***** Course 5: V-TIP Internship
Photography Course 1: Computer Technology 1A/1B Course 2: Electronic Art/Design Course 3: Web Page Design Course 4: Photography A/B***** Course 5: Advanced Photo or AP Photo* Course 6: V-TIP Internship	**CAD** Course 1: Computer Technology 1A/1B Course 2: Pre-Engineering A/B* Course 3: CAD I Course 4: CAD II Course 5: CAD III Course 6: V-TIP Internship
Accounting/Business Course 1: Computer Technology 1A/1B Course 2: Accounting Course 3: Computerized Accounting 2 Course 4: AP Statistics***** Course 5: V-TIP Internship	**Web Page** Course 1: Computer Technology 1A/1B Course 2: Electronic Art/Advanced Electronic Art Course 3: Web Page Design Course 4: Advanced Web Page Design Course 5: V-TIP Internship
Computer Science Course 1: Computer Technology 1A/1B Course 2: AP Computer Science A* Course 3: Computer Programming—C++ Course 4: IB Computer Science SL Course 5: IB Computer Science HL (Y1/Y2) Course 6: V-TIP Internship	**UC Approved Val Tech Classes*** (Note: These courses are not an official sequence for a Val Tech Certificate.) ·Photography A/B or AP ·Media Productions ·Comp. Sci. A & A/B ·AP Computer Science ·Comp. Prog. with JAVA ·Physics or AP Physics ·Trig/Math Analysis—H ·Journalism ·Animation ·AP Statistics ·IB Comp. Sci. ·AP Calculus ·IB Math ·IB Math (HL) Y1/Y2 ·Pre-Engineering

*****University of California (UC) Approved Course

Val Tech classes are scheduled according to the school's needs and therefore are not necessarily offered each semester. Contact Mr. Bell, Mr. Stanley, or Mr. Guest for specifics.

Sample Val Tech Academy Four-Year Plan

9th Grade

Language Arts 1
Biology
Geometry or Algebra 2
Foreign Language 1 or 2
VT Computer Technology 1A/1B
PE/Athletics/Band
Zero Period Health, ASCP Directed Study

Summer after 9th

VPA Elective for university preparation

10th Grade

Language Arts 2
World History
Algebra 2 or Math Analysis
Foreign Language
Val Tech Elective
PE/Athletics/Band
Chemistry

Summer after 10th

11th Grade

Language Arts 3
U.S. History
Math Analysis
Physics
Foreign Language 3 or AP
Val Tech Elective
Internship Seminar meeting—a 1-hour meeting after school—usually in early February.

Summer after 11th

12th Grade

Language Arts 4
Government/Economics
Math
Science or Visual and Performing Arts
Val Tech Elective
Val Tech Internship (This may be taken outside the traditional school day)

Note: This is a sample four-year plan. Each student's may be slightly different. You will have opportunities throughout the next four years to discuss this plan with Mr. Stanley or Mr. Guest and modify it.

Sample Val Tech Academy "U.C." Four-Year Plan

9th Grade

Language Arts 1 Honors
Biology Honors
Geometry or Algebra 2
Foreign Language 1 or 2
VT Computer Technology 1A/1B
PE/Athletics/Band
Zero Period Health, ASCP Directed Study

Summer after 9th

Visual Performing Arts Elective for college

10th Grade

Language Arts 2 Honors
A.P. European History
Algebra 2 or Math Analysis
Foreign Language 2 or 3
A.P. Computer Science
PE/Athletics/Band
Journalism/Pre-Engineering

Summer after 10th

11th Grade

A.P. English Language
A.P. U.S. History
Math Analysis or A.P. Calculus AB
Chemistry Honors
Foreign Language 3 or A.P.
IB Computer Science
Journalism

Internship Seminar—a 1-hour meeting after school—usually in early February.

Summer after 11th

12th Grade

A.P. English Literature
A.P. Government/Economics
A.P. Statistics
A.P. Foreign Language
A.P. Physics or (Visual Performing Arts Elective)
Photography
Val Tech Internship / Journalism (The Internship may be taken outside the traditional school day)

Note: This is a sample four-year plan. Each student's may be slightly different. You will have opportunities throughout the next four years to discuss this plan with Mr. Stanley or Mr. Guest and modify it.

Appendix

VAL TECH COURSE DESCRIPTIONS

9th Grade Required Course for All Pathways

COURSE TITLE: COMPUTER TECHNOLOGY 1A **Grades: 9-12**
Length: One Semester **Prerequisite: None**
Computer Technology is an introductory computer laboratory course. Students will use the computer for a variety of software applications and operations, to obtain additional computer information, to see computer trends, to research careers, and to explore further educational opportunities. Computer Technology is recommended for students who are preparing for college and/or a career. This class is required of all Val Tech students.

COURSE TITLE: COMPUTER TECHNOLOGY 1B **Grades: 9-12**
Length: One Semester **Prerequisite: Computer Technology 1A**
Students will build and expand on the technology skills learned in the first semester of Computer Technology. Students will select, combine, and apply appropriate software needed to function effectively in our rapidly changing technological, global society. Students will focus on advanced technology skills vital to business and industry, use technology to analyze and manage information, and integrate software applications. Students learn how to complete an electronic portfolio in Computer Technology 1B. All Val Tech students will keep all appropriate work in their electronic portfolio. Students who are part of the Val Tech Program must keep their electronic portfolio current while enrolled at Valencia High School. This class is required for all Val Tech students.

VAL TECH COURSE DESCRIPTIONS

IN

ARTS AND COMMUNICATION

COURSE TITLE: PUBLICATIONS/NEWSPAPER **Grades: 10-12**
Length: One Year **Prerequisite: Journalism Instructor Approval**
This course provides an in-depth, hands-on study of journalism techniques, editing skills, and publishing experiences. Correct grammatical usage, vocabulary building, punctuation, capitalization and proper journalism style are stressed. Experiences in writing leads, news, features (informative, first person, brights, personality sketch, reviews), editorials (explanatory, commendatory, critical), newspaper design, headline writing, photo cropping, caption writing, ad sales, and issue planning will be provided. Students are held accountable for reading selected literature and the analysis of that literature. This course may be repeated for credit.

Note: Much of the material found in these course descriptions was taken from the PYLUSD High School Course Description book. All courses are subject to revision, and the springtime needs assessment survey determines which courses are actually taught each semester. Contact Mr. Bell, Mr. Guest, or Mr. Stanley with specific questions.

COURSE TITLE: PUBLICATIONS/ANNUAL (YEARBOOK) **Grades: 9-12**
Length: One Year **Prerequisite: Teacher Recommendation**
This elective course provides an in-depth study of student publishing through actual experience in publishing the school yearbook. It provides the students with the opportunity to assume responsibility for all aspects of the publication of a yearbook, including planning, developing a budget, cost analysis, financing, sales (advertising and product), planning the book's content, design, theme development, headline writing, copy writing, caption writing, and photography. This course may be repeated for credit.

COURSE TITLE: CREATIVE WRITING /KEYSTONES **Grades: 9-12**
Length: One Semester **Prerequisite: None**
Students in Keystones are responsible for reading, editing, and inputting poems into the computer in preparation for publishing. Editors must also add graphics to the poems and short stories to enhance the written work. Editors will also create an index for the magazine. Editors will visit Language Arts classes to promote the magazine and to encourage students to submit their short stories, poems, anecdotes, and song lyrics for possible publication. Computer skills are a prerequisite as well as diligence and a positive work attitude. Only two students are selected to be Keystones editors per publication.

COURSE TITLE: TECHNICAL WRITING/LA4 **Grades: 12**
Length: One Year **Prerequisite: None**
This course fulfills all UC/CSU admission requirements. Students will complete all required LA4 coursework, but students will be given technical writing assignments whenever possible.

COURSE TITLE: PHOTOGRAPHY A **Grades: 9-12**
Length: One Semester **Prerequisite: None**
This elective course is designed to introduce the student to the processes and materials needed to produce high-quality black-and-white photographs. Instruction includes technical aspects of the camera, film types, processing negatives, and enlarging prints. Elements and principles of art are also considered.

COURSE TITLE: PHOTOGRAPHY B **Grades: 9-12**
Length: One Semester **Prerequisite: Photography A**
This elective course is designed to provide photography students with further information regarding a variety of techniques and materials related to the photographic process. Major instruction includes technical considerations, practical skills, and lab techniques necessary to prepare the student for employment in the field of photography. This single-semester course may be repeated a second time for credit.

COURSE TITLE: ADVANCED PHOTOGRAPHY **Grades: 9-12**
Length: One Year **Prerequisite: None**
This elective course is designed to provide photography students with information and skills regarding a variety of techniques and materials related to the photographic process. The aim of the course is to examine and understand the basic principles of the medium and to explore processes and techniques that will emphasize the distinctive aspects of the students' own photographic sense of communication. Emphasis will be place on history, culture, social issues, and aesthetic concerns within the visual arts.

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COURSE TITLE: AP PHOTOGRAPHY **Grades: 11-12**
Length: One Year **Prerequisite: Photography 1**
This elective course is designed to provide AP photography students with the skills needed to create and submit the AP Studio Art 2D Portfolio. The portfolio covers 24 exceptional pieces of artwork that are submitted to the College Board to allow students college credit for the class. The course is designed to be equivalent to an entry level college Photography course, and covers the use of technology and equipment used in both a traditional and digital environment, as well as more advanced historical and cultural subject matter. Students need to have completed both the prerequisite and summer coursework prior to the beginning of the class.

COURSE TITLE: ELECTRONIC ART/DESIGN **Grades: 9-12**
Length: One Semester **Prerequisite: None**
This elective course is designed to introduce the student to the basic concepts common to the field of electronic art and design. This course explores electronic media as a means of creative visual communication. It develops an understanding that art principles and technical skills are necessary for effective communication via electronic art.

COURSE TITLE: ADVANCED ELECTRONIC ART & DESIGN **Grades: 9-12**
Length: One Semester **Prerequisite: None**
This elective course will allow students to further explore key concepts in the field of electronic art and design. Students will also be introduced to advanced principles of electronic media manipulation. They will examine electronic medium as an avenue for creative visual communication. Students learn how to apply art principles and their technical skills to communicate effectively in the medium of electronic art.

COURSE TITLE: INTRODUCTION TO ANIMATION **Grades: 9-12**
Length: One Semester **Prerequisite: Art Fundamentals A**
This course introduces the student to the history and development of animation processes. This course explores a variety of animation techniques including pixilation, cutouts, cartoons, puppets, and computer animation. This course includes the production of animated sequences by the students.

COURSE TITLE: ANIMATION PROJECTS **Grades: 9-12**
Length: One Semester **Prerequisite: Introduction to Animation**
This elective course is designed to further instruct students in a variety of animation techniques such as stop frame, pixilation, claymation, and 2D and 3D computer animation. Students produce animated sequences.

COURSE TITLE: MEDIA PRODUCTIONS **Grades: 9-12**
Length: One Year **Prerequisite: None**
This course introduces students to the art and language of Film. Students will learn film terminology and use it in oral and written criticism of films studied in and out of class. Students will learn how to analyze a film, identifying mise-en-scene, narrative structure, genre conventions, and subtext. Students will use this knowledge as a springboard and to guide them in creating their own films. Students will learn pre-production, production, and post-production techniques of filmmaking using digital video cameras and computer editing software designed for media productions.

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VAL TECH COURSE DESCRIPTIONS

IN

BUSINESS & COMPUTER SCIENCE

BUSINESS

COURSE TITLE: ACCOUNTING 1 **Grades: 10-12**
Length: One Year **Prerequisite: Algebra 1 with a C or better or teacher recommendation**

This course covers a broad range of accounting principles and includes instruction in special journals, posting, trial balancing, work sheets, financial statements, adjustments, and closing ledgers. Students are introduced to computerized accounting. This course is highly recommended for students who are training for various business occupations as well as students planning on becoming accounting or business majors at the college level. (Satisfies one year of mathematics or elective requirement.)

COURSE TITLE: COMPUTERIZED ACCOUNTING 2 **Grades: 11-12**
Length: One Year **Prerequisite: Accounting 1**

This course is a continuation of Accounting 1. It gives students hands-on experience in using the computer to apply accounting concepts. This course provides a realistic, integrated approach covering the major components of an accounting cycle. This course is strongly recommended for students who are training for a business or accounting-oriented occupation as well as students planning on becoming accounting or business majors at the college level.

COURSE TITLE: BUSINESS FUNDAMENTALS **Grades: 9-12**
Length: One Semester **Prerequisite: Keyboarding**

This broad-based course facilitates the integration of academic and technical knowledge necessary for the high-performance workplace. Students will use appropriate business software, equipment, and materials to acquire the skills, knowledge, and ability needed to succeed. Business Technology Core standards include business communications, business environment, career preparation, job acquisition, economics of business, financial concepts, functions of business, human resources development, leadership development, and technology.

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BUSINESS/MATHEMATICS

COURSE TITLE: TRIGONOMETRY AND MATH ANALYSIS--HONORS Grades: 10-12
Length: One Year Prerequisite: Honors Placement Criteria
This course includes the following topics commonly found in pre-calculus mathematics: trigonometry; sets and logical statements; ordered fields, functions, polynomial functions; logarithmic and trigonometric functions; complex numbers, plane analytic geometry, matrices; vectors, induction, and the binomial function; permutations; combinations, and probability; sequences series and limits. This course reviews and unifies mathematical experience and acts as a transition from the mathematics commonly associated with the secondary schools to higher mathematics.

COURSE TITLE: IB MATH STANDARD LEVEL Grades: 10-12
Length: One Year Prerequisite: Placement Recommendation
Mathematical Methods is for students who anticipate the need for a sound mathematical background in preparation for their future studies. This course consists of the study of six core topics: Numbers and Algebra, Functions and Equations, Circular Functions and Trigonometry, Vector Geometry, Statistics and Probability, and Calculus. Students are also required to study one of the following options: Statistical Methods, Further Calculus, or Further Geometry. Students in Mathematical Methods are expected to already possess knowledge of basic concepts and to be equipped with the skills needed to apply simple mathematical techniques. This broad range of mathematical topics makes it a demanding course.

COURSE TITLE: IB MATH HIGHER LEVEL (Y1/Y2) Grades: 11-12
Length: One Year Prerequisite: Placement Recommendation
Mathematics HL is a two-year course designed for the student with a strong mathematics background, good technical and analytical skills, and a desire to learn more about mathematics for the enjoyment and challenge. Year 1 (Y1) is Trigonometry/Math Analysis—Honors and Year 2 (Y2) is AP Calculus BC.

COURSE TITLE: AP STATISTICS Grades: 10-12
Length: One Year Prerequisite: Placement Recommendation
This course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. Students are introduced to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, planning a study, anticipating patterns, and statistical inference.

COURSE TITLE: AP CALCULUS (AB AND BC) Grades: 11-12
Length: One Year Prerequisite: Placement Recommendation
This course includes finite and infinite limits, continuity; derivatives of algebraic, trigonometric, exponential, and logarithmic functions; definite and indefinite integrals; applications of the integral; sequences, series and convergence.

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COMPUTERS AND COMPUTER SCIENCE

COURSE TITLE: COMPUTER MAINTENANCE **Grades: 9-12**
Length: One Semester **Prerequisite: None**

This is a course designed to prepare students to operate, maintain, and repair microcomputer systems. Students receive instruction and hands-on applications in basic electronics and in setting up, troubleshooting, and servicing personal computer systems. Students explore and become familiar with software applications and operating system installation. Integrated throughout the course is additional information on computer trends, careers, problem solving, safety, and other employment skills. The course is open-entry, open-exit, and competency based.

COURSE TITLE: COMPUTER PROGRAMMING WITH JAVA **Grades: 10-12**
Length: One Semester **Prerequisite: "C" or better in Geometry and teacher recommendation required.**

JAVA computer programming is designed to enable students to develop skills in writing computer programs in the JAVA language. Topics will include algorithmic solutions of mathematical problems, software development, top-down program design, object-oriented programming, web page design, JAVA classes, objects and methods, JAVA syntax, primitive data types, strings loops, arrays, searching and sorting.

COURSE TITLE: COMPUTER PROGRAMMING WITH VISUAL BASIC **Grades: 9-12**
Length: One Semester **Prerequisite: "B" or better in Algebra 1**

Computer Programming with Visual Basic is a yearlong course in the Basic and Visual Basic programming languages. The course is designed to introduce students with sufficient math backgrounds to the fundamentals of computer programming and data manipulation. The course emphasizes top-down programming technique, proper syntax, proper documentation methods, event-oriented programming, graphic user interface design, and "end user" oriented programming.

COURSE TITLE: AP COMPUTER SCIENCE-A **Grades: 11-12**
Length: One Year **Prerequisite: Placement Criteria**

Computer Science AP-A, Programming with JAVA, is a yearlong Advanced Placement course. Students will learn to program in JAVA and prepare for the College Board Computer Science "A" test (APCS-A). JAVA is the language used to develop most operating systems and commercial microcomputer software. This challenging class will help students develop the ability to solve problems in logical ways while encouraging creativity. Topics covered will be consistent with the Advanced Placement (AP) Computer Science-A course and include the recommended subset as defined by the most recent edition of the College Board "acorn book." Students will acquire the technical knowledge and skills to write, compile, and execute computer programs. In addition, students will learn the entire process of designing and implementing a computer-based solution to a problem and programming/scientific methodology.

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COURSE TITLE: AP COMPUTER SCIENCE-AB **Grades: 11-12**
Length: One Year **Prerequisite: Placement Criteria**

AP Computer Science-AB, Programming with JAVA, is a yearlong Advanced Placement course. Students will learn to program in JAVA and may prepare for the College Board Computer Science "AB" test (APCS-AB). JAVA is the language used to develop most operating systems and commercial microcomputer software. This challenging class will help students develop the ability to solve problems in logical ways while encouraging creativity. Topics covered will be consistent with the Advanced Placement (AP) Computer Science-AB course and include the recommended subset as defined by the most recent edition of the College Board "acorn book." Students will acquire the technical knowledge and skills to write, compile, and execute computer programs. In addition, students will learn the entire process of designing and implementing a computer-based solution to a problem and programming/scientific methodology.

COURSE TITLE: IB COMPUTER SCIENCE **Grades: 9-12**
Length: One Year **Prerequisite: Placement Criteria**

This course is an in-depth problem-solving class using computer science algorithms and methodology. Following the pattern of the software life cycle (analysis, design, construction, testing, and revision), students solve real-world problems. Source code is written using an appropriate high-level computer language (C++). The students are assessed on their ability to think logically to solve problems using acceptable computer science algorithms and solutions that are efficient as well as socially and ethically responsible.

COURSE TITLE: INTRODUCTION TO WEB PAGE DESIGN **Grades: 9-12**
Length: One Semester **Prerequisite: Completion of Pre-Algebra Recommended**

Introduction to Web Page Design is a semester-long course designed to introduce students to web page design for both the Internet and an in-class Intranet which the students will design. Students will learn the basic of the HTML web design language which will allow them to design web pages. Students will use skills learned in the class environment to update and maintain an actual Internet Web Site. The HTML language is a simple language and is easy for the average student to learn. Upon completion of this course, the average student will be able to design, maintain, upgrade, and modify Internet/Intranet Web type documents. In addition, students will learn fundamental computer programming and operating skills. These skills can then be applied to other, higher-level computer programming courses, other computer-related courses, the school environment, and the workplace.

COURSE TITLE: ADVANCED WEB PAGE DESIGN **Grades: 9-12**
Length: One Semester **Prerequisite: Completion of "Introduction to Web Page Design with a Grade of C or better**

Advanced Web Page Design is semester-long course designed for students who have completed Introduction to Web Page Design and wish to learn advanced HTML code and create advanced web pages. Emphasis will be placed on higher-level HTML code structures and long-term projects in web page design. HTML (along with JAVA) are the languages used to produce the web-based documents presently available on the Internet. Upon completion of this course, the average student will be able to design, maintain, upgrade, and modify Internet/Intranet Web type documents. In addition, students will learn fundamental computer programming and operating skills. These skills can then be applied to other, higher-level programming languages, other computer-related courses, the school environment, and the workplace.

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COURSE TITLE: TELECOMMUNICATIONS 1 & 2 **Grades: 10-12**
Length: One Year **Prerequisite: Successful Completion of Algebra 1 or Teacher Recommendation**

In this yearlong course students learn computer networking. They acquire knowledge and skills necessary for getting and keeping an entry-level job in the computer networking field. Besides increasing career awareness among students, the course also challenges them to continue gaining networking skills and to learn to make informed decisions about their future education and career path.

COURSE TITLE: TELECOMMUNICATIONS 3 & 4 **Grades: 11-12**
Length: One Year **Prerequisite: Successful Completion of Telecommunications 1 & 2**

This is the second of two courses designed to provide students with classroom and laboratory experience in current and emerging networking technology that will empower them to enter employment and/or further education and training in the computer networking field. Content standards are based on a task analysis of current industry/occupational standards. The first half of this course includes switches, Local Area Network (LAN) and Virtual Local Area Network (VLAN) design, configuration, maintenance, internet work packet exchange (IPX), routing and interior gateway routing protocols (IGRP); and network troubleshooting. The second half of the course includes wide area networks (WANs), integrated services data networks (ISDN), point-to-point protocols (PPP), and frame relay design, configuration, and maintenance. Students develop practical experience in skills related to configuring WANs, ISDN, PPP, and frame relay protocols and network troubleshooting. Integrated throughout the course are career preparation standards which include basic academic skills, communications, interpersonal skills, problem solving safety, technology, and other employment skills.

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VAL TECH COURSE DESCRIPTIONS

IN

SCIENCE AND TECHNOLOGY

COURSE TITLE: PRE-ENGINEERING A/B **Grades: 9-10**
Length: One Year **Prerequisite: Chair's approval consistent with student's career pathway**

This course is designed to ensure that high-school students learn about the technology that affects their lives. Students learn mathematics, science, communication skills, history, and social science concepts through an activity-oriented approach. They learn to communicate effectively, solve problems, and present oral and written reports. This integrated linkage of technical and academic skills prepares high-school students for enrollment in advanced academic, vocational, and technical courses at all educational levels.

COURSE TITLE: ADVANCED PRE-ENGINEERING **Grades: 10-12**
Length: One Semester **Prerequisite: None**

This course is designed to build on the skills acquired in Pre-Engineering A and B. Students will specialize in three (3) of the technology labs available with an enhanced 30-hour curriculum, thus totaling 40 hours of instruction in a selected technology. Students learn to apply mathematics, science, communication skills, history, and social science concepts through an activity-oriented approach. They learn to communicate effectively and become independent thinkers and problem solvers. This integrated linkage of technical and academic skills provides entry-level workforce skills and prepares high-school students for enrollment in advanced academic, vocational, and technical courses at all educational levels.

COURSE TITLE: PHYSICS **Grades: 11-12**
Length: One Year **Prerequisite: Algebra 2 with a C**

This is a college-preparatory course designed to familiarize the students with the physical world around them, as revealed through motion, energy, wave phenomena, light and electricity, and structure of the atom and nucleus. Great emphasis is placed on problem-solving and graphical analysis of data; as such, mastery of physics depends significantly upon the student's skills in mathematics.

COURSE TITLE: AP PHYSICS **Grades: 11-12**
Length: One Year **Prerequisite: Placement Criteria**

This is a college-level course equivalent to a one-year non-calculus college physics course. The focus is on topics including mechanics, dynamics, heat, sound and wave theory, electricity and magnetism, light and optics and nuclear physics. Classroom instruction is designed to prepare the student to successfully pass the Advance Placement (AP) Physics B Exam using lectures, audio- visual materials and laboratory experiences. The College Board is designed to prepare students for the AP exams. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Several major unifying themes cut across the many topics included in the study of environmental science, and this course seeks to help students appreciate the essential interconnectedness of these disciplines.

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COURSE TITLE: ROBOTICS **Grades: 10-12**
Length: One Year **Prerequisite: None**
The objective of this course is to use a hands-on approach to introduce the basic concepts in robotics, focusing on micro controllers, autonomous mobile robots and real world applications. Information presented in class will be linked to lab experiments. Students will work in teams to build and test increasingly more complex LEGO-based mobile robots. Students will apply what they have learned through a series of robot contests. The course will use Parallax stamp micro controllers and Lego systems to illustrate the historical development of robotics, integrating sensors, electric circuits, gears and motors. More importantly, students will use knowledge learned in their core classes to problem solve. Students will use writing skills to communicate with the robots, math analysis to control movement, and their science background to design and measure variables such as acceleration and torque.

COURSE TITLE: INTRODUCTION TO COMPUTER-AIDED DESIGN (CAD I) Grades: 9-12
Length: One Year **Prerequisite: None**
This course teaches basics drafting skills and their application on the computer with emphasis on engineering drawing and architectural drawings. The architectural portion of the course includes designing and drawing residential homes and small commercial buildings. The engineering portion of the course includes descriptive geometry, technical illustration, assembly drawings, cross sections, and orthographic projections. Introduction also includes research into CAD (computer-assisted drafting) careers and a broad incorporation of the design process. The emphasis in the introduction course is to familiarize the students with the CAD interface, reading blueprints, and drawing descriptive two-dimensional drawings that are technically correct.

COURSE TITLE: ARCHITECTURAL/ENGINEERING CAD (CAD-II) **Grades: 10-12**
Length: One Year **Prerequisite: CAD I**
Teaches intermediate drafting skills and their application on the computer with emphasis in architectural drawings and some engineering drawings. This course includes designing and drawing small commercial and residential buildings in 2 dimensional and 3 dimensional views. This will also give each student exposure to unique real-world disciplines. The emphasis in the intermediate course is to become more technically proficient with the interface using the command line entry method, draw descriptive 1, 2, and 3 dimensional drawings that are technically correct, more advanced CAD interfaces and plotting (a.k.a. printing) to scale.

COURSE TITLE: ADVANCED CAD (CAD-III) **Grades: 11-12**
Length: One Year **Prerequisite: CAD-II**
Teaches advanced drafting skills and their application on the computer with emphasis in engineering drawings, architectural drawings, and real world group projects. Additionally, 4 “mini-units” using “Inventor Series”, “VIZ”, “Mechanical Desktop”, and “Intermediate AutoCAD” will give each student exposure to unique, professional disciplines. The emphasis in the advanced course is to become more technically proficient with the interface using keyboard shortcuts, toolbars, and the command line entry method. Also, being able to draw descriptive 1-,2-, and 3-dimensional drawings that are technically correct, advanced CAD interfaces, plotting to scale, and manufacturing requirements.

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VAL TECH REQUIRED COURSE

12th Grade Required Course for All Pathways.

All Val Tech Students Must Complete

COURSE TITLE: VAL TECH INTERNSHIP (V-TIP) **Grades: 12**
Length: One Year **Prerequisite: None**

Students will work with an approved organization to arrange and complete a technology-related internship program in an area of interest to them. Students can schedule this 150-hour, ten-credit internship for the summer between their junior and senior years or during their senior year. V-TIP also includes a research project (which is completed in the Val Tech LA-4 class, or independently in either a regular LA-4 class or an AP-LA-4 class), a reflective essay, and an oral presentation. Students working toward a tech diploma will also construct an electronic portfolio. Students must attend an orientation seminar in the spring semester (usually in early February) of their junior year and 3 to 5 lunchtime meetings in May/June so that they can successfully complete their internship and electronic portfolio. Additionally, during their senior year, students must meet during lunch once a week with the Val Tech Coordinator in order to prepare for their final presentation. After successful completion of all the V-TIP requirements, the entire 10-credits will be earned and recorded on the student's final senior report card (June of their senior year).

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Thanks for taking the time to learn more about the Val Tech Program.

Every effort has been taken to provide accurate and consistent information in this manual. If you have any questions, or for more information, please visit our website at www.vhstigers.org or you may contact us:

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