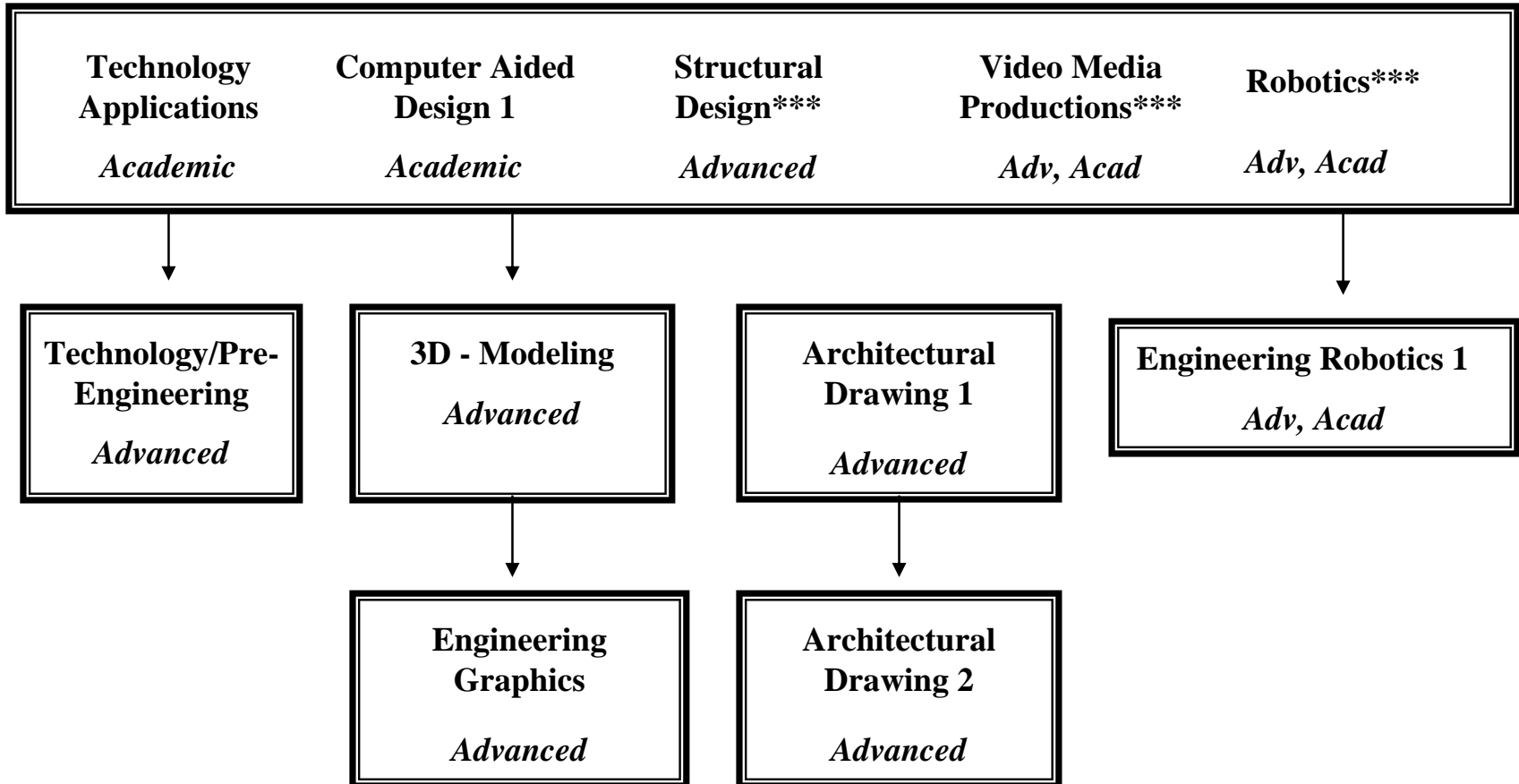


Technology

Suggested Course Sequence

Semester Courses



TECHNOLOGY

Technology education is defined as the action-based discipline devoted to the application of human activity to solve problems and to extend capabilities through the manipulation and control of the environment using knowledge, creativity, and resources.

All courses satisfy the Career Education and Consumer, Family, and Life Skills requirement.

Technology Applications (Academic)

2.5 credits 1 Semester course

Prerequisite: none

Available to grades 9-12

This applied science course teaches problem-solving techniques which are used in all levels of the educational process, in almost every type of employment and in our day to day life situations. These techniques are taught through a series of labs providing students with the opportunity to isolate a problem, explore potential solutions, select and develop a solution into an actual product, test that product, and generate an analysis of its effectiveness.

Lab units include aerodynamics, transportation, engineering, digital communication, materials and processes, internet applications, real-life robots, and computer controlled machines.

The Technology Applications course provides students with the opportunity to use many of the math and science principles they have previously learned in school and develop those principles and concepts into realistic, touchable situations.

This course provides challenges for all students. It is highly recommended for students interested in any field of engineering, science, physics, mathematics, computer science or any technical field. This type of hands-on approach to problem solving gives students an advantage in post high school studies.

Technology/Pre-Engineering (Advanced)

5.0 credits

Prerequisite: Technology Applications

This is a second year, advanced level course for students who wish to further their knowledge and skills in technology and in the basics of the eight-step problem solving and design loop. Manufacturing technology will be explored in-depth through the use of computer numerical control (CNC), standard machines, CNC programming, using mastercam, machine setup,

operation, part production and assembly. The computer integrated manufacturing (CIM) unit includes robots using such peripheral equipment as conveyors, pneumatic part feeders, and rotary tables. Robot programming skills include the use of sub-routines and conditional logic branching based on sensor input and feedback. Students will explore the uses and function of programmable logic controllers and ladder logic programming. Additional skills will be developed in fluid power, pneumatic principles, components, and systems. The aerodynamic unit explores airflow, turbulence, and drag on student constructed working models. The mechanical design unit explores mechanisms, drive systems, mechanical power transmission, ratio's, speeds, and forces. Problem solving techniques, design skills, math applications, and scientific principles are continually developed.

This course is recommended for anyone considering a career in engineering and is appropriate for those interested in computer science, manufacturing, business or any technical field. It may be repeated, with credit, to further develop individual talents and skills

Students will maintain a portfolio throughout the year to serve as documentation of their progress and accomplishments in each lab area.

Computer Aided Design 1 (Academic)

2.5 credits 1 Semester course

Prerequisite: none

Available to grades 9-12

This course teaches a global form of communication that is used extensively in higher education, industry, business and professional life. Through the use of computers, students will be exposed to technical communication software which includes 3D modeling programs. In addition, this course provides students with the opportunity to develop essential drawing technical illustration skills using CAD software.

Students document their work throughout the course by creating a portfolio. The completed portfolio will provide the student with a record of his/her work which can be shown at college and/or job interviews.

Computer Aided Design is a fun, challenging course which is highly recommended for students interested in any technical field such as engineering, science, physics, mathematics or computer science. This approach to technical communication and problem solving gives students an advantage in post high school studies.

3-D Modeling (Advanced)

2.5 credits 1 Semester Course

Prerequisite: Computer Aided Design 1

This course teaches a global form of communication that is used extensively in higher education, industry, business and professional life. Through the use of computers, students will be exposed to technical communication software that includes 3D modeling and animation programs. In addition, this course provides students with the opportunity to develop advanced 3D modeling, printing and presentation skills through the study and application of material mapping, lighting techniques, shadowing, perspective viewing, rendering, photo image output, slide shows and basic animation of 3D objects output to motion picture files.

Students document their work throughout the year by creating a digital portfolio incorporating digital camera pictures and webpage development software. Upon completion of the portfolio a compact disk may be "burned", giving the student a record of their work which can then be shown at college and/or job interviews.

Computer Aided Design provides students with the opportunity to enhance and expand their repertoire of technical communication skills through a wide variety of computer aided design and presentation techniques. It is highly recommended for students interested in any technical field such as engineering, science, physics, mathematics, or computer science. This approach to technical communication and problem solving gives students an advantage in post high school studies.

Engineering Graphics (Advanced)

5.0 credits

Prerequisite: Computer Aided Design 2

This advanced level course is structured to provide students with an opportunity to develop engineering skills, explore programmatic solutions to design application problems, and acquire problem solving experience through prototyping. Students will study graphic representation through detail and assembly engineering drawings and image processing through parametric 3D graphics and illustrations. Students will become familiar with hardware requirement needs, and networking basics such as internet collaboration and web development.

Students will document their work throughout the year by creating a portfolio. The portfolio may incorporate digital camera pictures, webpage development, prototypes, prints, plots and digital media. The completed portfolio will provide the student with a record of their work which can be shown at college and/or job interviews.

Investigations into professions related to the design industry will connect the classroom experience with

future career paths. This course is highly recommended for students planning careers in engineering. Engineering Graphics may be repeated, with credit, for the further development of individual talents and mastery of advanced skills.

Architectural Drawing 1 (Advanced)

5.0 credits

Prerequisite: Computer Aided Design 1

Architectural Drawing 1 is a second-year course dealing with the techniques used in designing, drawing, and constructing residential buildings. Through the use of computers, students will use architectural design software to produce 2D and 3D drawings and renderings. Over the course of the school year, each student will be required to design and draw a set of original house plans. In addition, this course provides students with the opportunity to develop basic 3D modeling, printing and presentation skills.

Students document their work throughout the year by creating a digital portfolio incorporating digital camera pictures and webpage development software. Upon completion of the portfolio, a compact disc will be "burned", giving the student a record of their work which can then be shown at college and/or job interviews.

Architectural Drawing 1 provides students with a foundation of knowledge for higher education and is highly recommended for students interested in architecture, engineering, mathematics or science, or for a technical program at a two-year college.

Architectural Drawing 2 (Advanced)

5.0 credits

Prerequisite: Architectural Drawing 1

Architectural Drawing 2 is an advanced course dealing with the techniques used in designing, drawing and constructing residential buildings. Through the use of computers, students will be exposed to architectural design software that includes 3D modeling and animation programs.

Over the course of the school year, each student will be required to design and draw a detailed set of original house plans. In addition, this course provides students with the opportunity to develop advanced 3D modeling, printing and presentation skills through the study and application of material mapping, lighting techniques, perspective viewing, rendering, photo image output, slide shows and basic "walk through" animation of 3D houses.

This course provides students with the opportunity to enhance and expand their repertoire of architectural communication skills through a wide variety of

computer aided design and presentation techniques. It is highly recommended for students planning a career in architecture, engineering, construction trades, or related design fields. This course may be repeated, with credit, to enhance the further development of individual talents and mastery of advanced skills.

Robotics (Advanced, Academic)

2.5 credits 1 semester course

Prerequisite: None

Available to grades 9-12

This introductory Robotics course uses a hands-on approach to introduce fundamental concepts in the fields of mechanical and electrical engineering and computer science. Students will explore basic electronics and design and build robots. The course will include the concepts of coordinate transformations, sensors, path planning, kinematics, feedback and feed-forward control.

Engineering Robotics (Advanced/ Academic)

2.5 credits 1 semester course

Prerequisite: Robotics

Available to grades 9-12

This course continues the hands-on approach to learning concepts in the fields of mechanical and electrical engineering. Students will apply these concepts to program and build robots.

Structural Design (Advanced)

2.5 credits 1 semester course

Prerequisite: None

Available to grades 10-12

Students in this course will have the opportunity to research, design and construct projects to solve simulated and real problems relating to engineering and real life challenges. Working individually and as a team, students will explore and apply engineering principles. This course will provide computer simulations and apply hands on use of equipment, tools and materials to create, build and test solutions.

Students will evaluate, analyze and document test results to identify effectiveness in meeting their design challenges. Scale models and full size projects may include, but are not limited to: truss bridge engineering, tower stress testing, buildings and habitat fabrication, and simple machines.

Video Media Production* (Advanced, Academic)**

2.5 credits 1 semester course

Prerequisite: None

Available to grades 10-12

This course is designed to help students develop skills in the fundamentals of video production, including videotaping, editing and output of digital video. The techniques and application of storyboards, special effects for audio and video, and graphic design for multi-media product presentation will be explored. This course is recommended for all students interested in multi-media communication, graphic illustration, visual arts and cinematography and provides students with the opportunity to enhance and expand their repertoire of technical communication skills which are essential in today's professional and technical fields.



