

## 2012-2013 Technology Engineering Program Upper School Partnership Program Technology Prerequisites

<b>Architecture Major</b>		
Note: Bold Classes are required and credits must total 15 for the Partnership major.		
Grade	Course	Prerequisites
9,10	Exploring Residential Home Design	
9-12	Introduction to Engineering	
9	Introduction to Computer Aided Design	
10-12	Computer Aided Drafting and Design I	
11	<b>Architectural Design I</b>	Must have passed Home Design, CAD I, or Intro to CAD <b>OR</b> be taking CAD I
12	<b>Architectural Design II</b>	Architectural Design competency
<b>Engineering Major</b>		
Note: Bold Classes are required and credits must total 15 for the Partnership major.		
Grade	Course	Prerequisites
9-12	<b>Introduction to Engineering</b>	
10,11	<b>Computer Aided Drafting and Design I</b>	
12	<b>Engineering CAD/CAM</b>	Computer Aided Drafting and Design I
<b>Automotive Technology Major</b>		
Note: Bold Classes are required and credits must total 15 for the Partnership major.		
Grade	Course	Prerequisites
11	<b>Automotive Technology I</b>	
12	<b>Automotive Technology II</b>	Automotive Technology I competency
<b>Graphic Communications Major</b>		
Note: Bold Classes are required and credits must total 15 for the Partnership major.		
Grade	Course	Prerequisites
10-11	<b>Graphic Communications 1</b>	
11-12	<b>Graphic Communications 2</b>	Graphic Communications 1 and teacher recommendation
11-12	Digital Illustration	Graphic Communications 2 or Commercial Art I and teacher recommendation
11-12	Digital Photography	Graphic Communications 1 or Art Foundations and teacher recommendation
10-12	Commercial Art 1	Graphic Communications 1 or Art Foundations and teacher recommendation
9-10	Computer Tools for Business	
10-11	Introduction to Marketing	
11-12	Fashion Merchandising and Marketing	

### Wachusett Partnership Program

Students who opt for enrollment into the Partnership Program will complete a Wachusett Partnership Program application with their Guidance Counselor. At the time of registration, the guidance counselor will review the required course work and expectations of the major. There are a limited number of positions available in many of the Partnership offerings and selection into the program is guided by the needs of the individual student. Although, registration for a Partnership course is available to all students at Wachusett Regional High School, priority is given to those students who are accepted into the Partnership Program through application.

Each major is aligned with course offerings that will give a Partnership student a total of fifteen credits in their selected focus. Students must meet a minimal level of identified competencies at the end of their junior year for them to earn credit and continue in the major. College credits may be earned for some career courses in which students earn an overall grade of "B" or better.

### **Introduction to Computer-Aided Design (CAD) (Grades 9-11)**

2 1/2 credits

Preference given to freshmen and sophomores

This course will introduce students to the drafting trade, using Computer Aided Design (CAD) techniques and processes. The students will explore the basics of sketching, orthographic projection, and dimensioning objects through 2D CAD software to produce detailed drawings and plans. In addition, students will gain knowledge of a computer aided manufacturing environment to enhance their understanding of today's technological processes as related to drafting and design.

### **Introduction to Engineering (Grades 9-12)**

5 credits

No prerequisites required- Preference given to freshmen and sophomores

This is a pre-engineering program that provides students with a solid foundation of knowledge and experience. Students will immerse themselves in the early stages of engineering and will have the opportunity to explore pre-engineering experiences in the areas of: Architecture Design (Residential Construction and Engineering Structures); Computer Technology (Computer Repair, Networking and the Internet); Automotive Technology (Introduction to the Automobile and the Nine Automotive Systems); Manufacturing (CNC Mill, Materials, Robotics, Material Science); Communications (Web Page Design, Computer Animation, 3D Modeling); Biotechnology (Genetics and Plant Science). Students will be involved in hands on activities and will be required to integrate math, science, and technology skills helping the student to understand engineering through conceptual design activities.

### **Exploring Residential Home Design (Grades 9-12, WPP)**

2 1/2 credits

Preference given to freshmen and sophomores. Students should not be enrolled in Exploring Residential Home Design and Architectural Design concurrently.

This is a semester course aimed at students interested in an introductory level architectural CAD course. The course is divided into a series of projects developed to help students explore and appreciate architectural design and drafting. The course is project centered and will require students to use step-by-step instructions providing them with an understanding of the concepts and processes used to create their own home designs. Students will create 3D designs and will practice traditional drawing techniques, s/a sketching, shading and lettering to preliminary design ideas.

### **Architectural Design I (CPA, Grades 11-12, WPP)**

5 credits (Prerequisites: Computer Aided Design I (CAD), Intro. To CAD, or Exploring Home Design) This course may be not be taken concurrently with Exploring Residential Home Design.

This course will begin to build an understanding and prepare for a career in architecture or architectural drafting. Students will complete a series of units that cover topics such as: The Story of Architecture, Architects and Builders, Building Codes, The Design Process, Room Planning, Drafting Equipment and Procedures, Architectural Lettering, Sheet Layouts, and Drawing a Floor Plan. A tutorial task will complement the reading in each of the topics covered. Students will develop an architectural scrapbook building upon their ideas and designs.

### **Architectural Design II (CPA, Grade 12, WPP)**

5 credits (Prerequisite: Architectural Design I)

This course will be a more in-depth study of Architectural Design. Students will further their studies of the following units: the building shell, working with stairs, completing the shell, adding the foundation, working with roofs, electrical and lighting, working with a site and creating working drawings. Materials and construction methods will also be discussed as well as the various systems and elements to include floor, wall, and roof systems, in addition to doors and windows, fireplaces and chimneys. Students will work step-by-step through drawing an entire house and generating a

complete set of plans for production. Innovations in architecture such as methods for achieving homes that require little or no non-renewable energy will be addressed. Student will continue to add to their scrapbook and complete it. Students will also work on individual and group design projects.

### **Computer-Aided Drafting and Design I (CP - Grades 10-12, WPP)**

5 credits - No prerequisites required – Preference is given to sophomores and juniors  
This course deals with graphic representations used in the design and drawing of machine components and engineering structures. Students will acquire basic skills in free-hand sketching and visualization, orthographic projection, and blueprint reading. The students will build on these skills by accessing in-depth knowledge in isometric views, dimensioning, and sections using state-of-the-art 2D and 3D modeling software to develop neat and accurate working drawings and assemblies. All these are necessary skills for technical or engineering careers.

### **Engineering CAD/CAM [Computer-Aided Design/Computer-Aided Manufacturing] (CPA, Grades 11-12, WPP)**

5 credits (Prerequisite: Introduction to CAD or Computer Aided Drafting and Design I)  
This full-year course will provide students with an in-depth learning experience in computer-aided design and hands-on experience on the processes of computer-aided manufacturing, using state-of-the-art equipment. Students will use the Engineering Design Process and utilize 3D modeling software (SolidWorks) to design and create models. They will also produce various products using Computer Numerical Controlled (CNC) machines. The students will simulate a Flexible Management System and production centers to create a real-time manufacturing environment. This course is highly recommended for students who plan to attend a technical school, enroll in an engineering college program, or pursue a technology career after graduation.

### **Auto Technology I (Grades 11–12, WPP)**

5 credits. No prerequisites. Grade 11 and 12 students only with juniors getting preference.  
This course will be of interest to those students planning to enter the automotive or small engine technology field or wishing to do their own service work. Topics to be studied will include principle operations and basic repair of internal combustion engines, all the major systems, lubrication systems, and engine tune-up and basic trouble shooting procedures. Service work will be performed by students on student and faculty owned automobiles and during automobile service units. Since this course is a prerequisite for Auto Mechanics II, preference will be given to juniors.

### **Auto Technology II (CP, Grade 12 only, WPP)**

10 credits. Two periods/day. Prerequisite: Auto Technology I.  
This double-period course will give those students wishing to enter the field of automotive technology the experience to trouble-shoot, repair, and maintain the various automotive systems. Emphasis will be placed on diagnostic tune-up procedures, brake systems, steering and suspension, and general maintenance and repair procedures of the major automotive systems. Students will work on their own vehicles as well as those belonging to the faculty and members of the community. This course will provide the student with the background needed to be successful in a future vocational technical institute or to enter directly into the automotive repair trades.

## **Graphics Courses**

### **Graphic Communications I (CP, Grades 9-12 WPP)**

5 credits (No prerequisites required)  
This course provides an introduction to the graphic arts. Emphasis is placed on the digital design process. Students learn the elements and principles of design while exploring the creative capabilities of the Adobe Creative Suite software. Visual expression, problem solving, page layout, and image creation are presented. This course is a prerequisite for Graphic Communication II. Preference will be given to students in grades 9-11. This is a required course for students in the

Wachusett Partnership Program Graphics major, but students do not need to be in the WPP to take this course.

**Graphic Communications 2 (CPA, Grades 11-12 WPP)**

5 credits (Prerequisite: Graphic Communications 1)

Students work on more complex digital images using the Adobe Creative Suite software. Students develop their own style of design and visual expression. In addition, students design and lay out *The Echo*, the school newspaper, and create posters for WRHS theatrical productions. Students are expected to be self-motivated and able to meet deadlines. Preference will be given to students in Grades 10-11. This is a required course for students in the Wachusett Partnership Program Graphics major, but students do not need to be in the WPP to take the course.

