

# Design & Fabrication

This two-year program is all about creation, turning ideas into designed images and those images into real three dimensional, useful, and attractive products. A major part of the program consists of using several drawing and Computer Aided Design (CAD) software programs. Students develop knowledge of the working properties of metals such as steel, cast iron, aluminum and brass as well as plastics, composites, wood, and marble and how those properties affect their product design. Students turn their ideas into products on a variety of Computer Numerically Controlled (CNC) and manual equipment. A variety of precision and hand measuring tools are used during creation and inspection of products. Safety, material selection, purchasing, product cost and record keeping are also taught during the first year. Most aspects of the fabrication industry are explored during the year.

During the second year of the program the students' product designs become much more complex and marketing issues such as costs of materials, personnel and equipment time, accounting procedures, customer and marketing methods are included in design decisions. Students produce products from blueprints and written specifications of their own design utilizing CNC equipment and directly connected computer to laser and plasma cutters. They come to understand product liability and safety, and appreciate the necessity of following precise procedural sequences and detailed documentation. This program includes an introduction to starting one's own business. Job attitudes and employer/employee relationships, like those found in industry, are emphasized to ensure future success. All projects simulate those made in modern companies. Tours of local and out-of-state inventors, small and large scale fabrication companies and machine shops are taken throughout the program.

## **Industry Recognized Certifications:**

Students will experience an Industrial Scenario Assessment process and will receive certification from both the Vermont Department of Education and local manufacturers.



*For students in grades: 11-12*

**Credits:** Three credits per year

## **Graduation Requirements:**

**Math, Science and Technology-** Completing both DESIGN & FABRICATION TECHNOLOGY 1 and 2, will fulfill one Math Credit, one Science Credit and the MAUHS 0.5 Technology credit requirements.

**College Connections:** Specific articulation agreements between Hudson Valley Community College and the Design and Fabrication Program have been established.

**Prerequisite:** A 9<sup>th</sup> grade reading level and above a 70 in Algebra and Geometry and Instructor permission

# Design & Fabrication

## Students Study:

- Industry Safety
- Welding
- Design
- Drafting / Blueprint Reading
- CAD / CAM
- CNC



## Post Program Employment:

Design and Fabrication students have been employed by

|                          |               |
|--------------------------|---------------|
| JPSA Lasers              | GE            |
| K & M Plastics           | Mack Molding  |
| NSK                      | Quadrattech   |
| Plasan                   | VT Composites |
| Flomatic Corp.           | Duramill      |
| Vt. Container            | Eveready      |
| Army                     | Navy          |
| Cambridge Valley Machine |               |

## Post Program Education:

Design and Fabrication students have enrolled in

|                                        |                                   |
|----------------------------------------|-----------------------------------|
| Community College of Vermont           | Rennselear Polytechnic Institute  |
| Hudson Valley Community College        | Rochester Institute of Technology |
| Idaho, University of                   | Southern Maine Technical College  |
| Lehigh University                      | SUNY, Albany                      |
| Massachusetts, University of (Amherst) | Syracuse University               |
| Norwich University                     | Vermont Technical College         |
| Pennsylvania State College             | Vermont, University of            |
| Rennselear Polytechnic Institute       | Wentworth Institute of Technology |
|                                        | Wyoming Technical College         |

## CAD & Fabrication Introductory Course

This one-semester course is designed to create or further student interest in engineering, design and fabrication. CAD & Fabrication introduces students to computer aided design (CAD), computer numerically controlled (CNC) machinery and combining these two exciting areas to design and produce a marketable and cost-effective product.

**For students in grades:** 9-10

**Scheduling:** 1 Semester 60 minute per day

**Credits:** 0.75 credits

### Graduation Requirement:

**Technology-** This course fulfills the MAUHS ½ credit in Technology requirement.

### Computer Aided Design & Fabrication Students Study:

- AutoCAD
- Career Opportunities
- Design Process
- CNC
- Excel Spreadsheet
- Energy consumption
- Reading Drawings
- Time Management
- Project Timelines & Teamwork
- Inspection Data Sheet
- Tooling Lists
- Material Lists & Costs
- Purchasing Materials
- Safety
- Manufacturing Processes
- Computer Aided Manufacturing (CAM)
- Cartesian Coordinate System

Students that complete Computer Aided Design and Fabrication will be given priority placement in the Engineering and Design; Design & Fabrication and Artificial Intelligence programs.

# Southwest Vermont Career Development Center Schedule FY 2012

| SEMESTER ONE                        |                                  |       |       |                             |                               |  |
|-------------------------------------|----------------------------------|-------|-------|-----------------------------|-------------------------------|--|
| Block 1 (90 min)                    | Block 2a                         | Lunch | Prep  | Block 3b                    | Block 4 (90 min)              |  |
| 7:50-9:20                           | 9:25-10:20                       | Prep  | Lunch | 11:35-12:30                 | 12:35-2:05                    |  |
| Accounting & Finance 1 & 2          | Marketing 2                      |       |       | Business Basics             | Marketing 1                   |  |
| Business Mgt 1 & 2                  |                                  |       |       | Culinary Arts Intro         |                               |  |
| Culinary Arts 1                     |                                  |       |       | Computer Aided Design       | Culinary Arts 1               |  |
| Engineering & Design 2              |                                  |       |       | Creative Computing          | Engineering & Design 1        |  |
| Design & Fabrication 2              |                                  |       |       | Architecture & Construction | Design & Fabrication 1        |  |
| Computer / Networking Academy 1 & 2 |                                  |       |       | Auto Maintenance            | Artificial Intelligence 1 & 2 |  |
| Building Trades 2                   |                                  |       |       |                             | Building Trades 1             |  |
| Auto Technology 2                   |                                  |       |       |                             | Auto Technology 1             |  |
| Forestry & Heavy Equipment 2        |                                  |       |       |                             | Forestry & Heavy Equipment 1  |  |
| Water & Your Environment            |                                  |       |       | Plants & Flowers            | AgroEcology 1 & 2             |  |
| Video Productions 1                 | Video Productions 2              |       |       | Stagecraft                  | Theater Arts 1 & 2            |  |
|                                     |                                  |       |       |                             | Communications Tech 1 & 2     |  |
|                                     | Intro to Print Publishing: Yr Bk |       |       |                             |                               |  |
| Law Enforcement 1                   |                                  |       |       | Law Enforcement 2           |                               |  |
| Pre-Law 1 & 2                       |                                  |       |       | Forensic Investigations     | Business & Personal Law       |  |
| Cosmetology 1                       |                                  |       |       | Cosmet. Intro.              |                               |  |
|                                     |                                  |       |       | Cosmetology 2               |                               |  |
| Human Services 2                    |                                  |       |       | Emergency Medicine Intro.   | Human Services 1              |  |
| Medical Professions 2               |                                  |       |       |                             | Medical Professions 1         |  |

| SEMESTER TWO                    |                         |       |       |                               |                               |  |
|---------------------------------|-------------------------|-------|-------|-------------------------------|-------------------------------|--|
| Block 1 (90 min)                | Block 2a                | Lunch | Prep  | Block 3b                      | Block 4 (90 min)              |  |
| 7:50-9:20                       | 9:25-10:20              | Prep  | Lunch | 11:35-12:30                   | 12:35-2:05                    |  |
| Accounting & Finance 1 & 2      | Business Basics         |       |       |                               |                               |  |
| Marketing 2                     |                         |       |       | Marketing 1                   |                               |  |
| Business Mgt. 1&2               |                         |       |       |                               |                               |  |
| Culinary Arts 1                 | Culinary Arts Intro     |       |       | Culinary Arts 1               | Culinary Arts 1               |  |
| Engineering & Design 2          | Computer Aided Design   |       |       | Engineering & Design 1        | Engineering & Design 1        |  |
| Design & Fabrication 2          |                         |       |       | Design & Fabrication 1        | Design & Fabrication 1        |  |
| Computer/Networking Academy 1&2 | Creative Computing      |       |       |                               |                               |  |
|                                 |                         |       |       | Artificial Intelligence 1 & 2 | Artificial Intelligence 1 & 2 |  |
| Building Trades 2               |                         |       |       | Building Trades 1             | Building Trades 1             |  |
| Auto Technology 2               |                         |       |       | Auto Technology 1             | Auto Technology 1             |  |
| Forestry & Heavy Equipment 2    |                         |       |       | Forestry & Heavy Equipment 1  | Forestry & Heavy Equipment 1  |  |
| Agri Science                    | Plants & Flowers        |       |       |                               | AgroEcology 1 & 2             |  |
| Video Productions 1 & 2         |                         |       |       |                               |                               |  |
|                                 |                         |       |       | Theater Arts 1 & 2            | Theater Arts 1 & 2            |  |
|                                 |                         |       |       | Communications Tech 1 & 2     | Communications Tech 1 & 2     |  |
| Law Enforcement 1               | Forensic Investigations |       |       | Law Enforcement 2             | Law Enforcement 2             |  |
| Pre-Law 1 & 2                   |                         |       |       |                               | Forensic Investigations Adv.  |  |
| Cosmetology 1                   | Cosmetology 1           |       |       | Cosmet. Intro.                |                               |  |
|                                 |                         |       |       | Cosmetology 2                 |                               |  |
| Human Services 2                |                         |       |       |                               | Human Services 1              |  |
| Medical Professions 2           |                         |       |       |                               | Medical Professions 1         |  |



# Application 2011/2012

LAST NAME: \_\_\_\_\_ FIRST NAME: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_  
 Town: \_\_\_\_\_ State: VT/NY/MA Zip: \_\_\_\_\_  
 Home Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Today's Date: \_\_\_\_\_  
 Date of Birth: \_\_\_\_\_  
 Gender:  Male  Female  
 Current Year in School:  
 8<sup>th</sup>  9<sup>th</sup>  10<sup>th</sup>  11<sup>th</sup>  12<sup>th</sup>  
 Current CDC students put your  
 Tech Program's initials here: \_\_\_\_\_

### School Counselor(s) / Contact Person(s)

**Arlington Memorial High School**  Joanna Lederer-Barnes  
 \_\_\_\_\_  
 Other Advocate: \_\_\_\_\_  
**Burr & Burton Academy**  Phil Anton  Maria Bittinger  
 Stephanie Fowler  Andrea Hogan  Melissa Michaud  Cristin Rose  
 \_\_\_\_\_  
 Other Advocate: \_\_\_\_\_  
**Mt. Anthony Union High School**  
 Tonia Bucciero  Eric Caron  Lisa Harrington-Redding  
 Meg Honsinger  Dan Lucy  Coleen Macksey  Nancy Vanderbilt  
 \_\_\_\_\_  
 Other Advocate: \_\_\_\_\_  
**Twin Valley High School**  Denise Piffard  
 \_\_\_\_\_  
 Other Advocate: \_\_\_\_\_  
 Other School: \_\_\_\_\_  
 Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

### **Tech Programs** [Full Year]

(The embedded graduation requirements are listed in parentheses- see Program of Studies for complete information)

- ➔ Mark **2nd & 3rd choices** also in case your **1st** is full.
- Accounting & Finance(cc) (Math, MAU-Tech)
  - Agroecology (Science)
  - Artificial Intelligence(cc) (Math, Sci. & MAU-Tech.)
  - Auto Technology(cc) (Science)
  - Business Management (Math, MAU-Tech)
  - Building Trades (Math)
  - Computer Networking Academy(cc) (Science.)
  - Cosmetology (Science)
  - Culinary Arts (Science)
  - Design & Fabrication (Math, MAU-Tech)
  - Engineering & Design(cc) (Art, MAU-Tech Math,Sci)
  - Forestry & Heavy Equipment(cc) (Science)
  - Human Services(cc) (Social Studies)
  - Law Enforcement(cc) (1 Yr only) (Social Studies)
  - Marketing Education (Math)
  - Medical Professions(cc) (Science)
  - Networking Academy(cc) (Math, Sci. MAU-Tech)
  - Pre-Law(cc) (Social Studies)
  - Theater Arts (Art, English)
  - Video Production(cc) (MAU-Tech)
- Co-op (2nd year students only)

(cc) = College Credit option available. See page 11 of Course Catalogue or [www.svcdc.org](http://www.svcdc.org)

### Foundation Courses

**Short Block** (\*50 or #60 minutes, 1 Sem.)

- SB Architecture & Construction\*
- SB Automotive Maintenance#
- SB Business Basics\*
- SB CAD Design & Fabrication#
- SB 3D/CAD\*
- SB Creative Computing\*
- SB Forensic Investigation#
- SB Plants & Flowers\*
- SB Emergency Medical Intro.\*
- SB Mental Illness Intro.to\*

**Long Block** (90 Minutes, 1 Semester)

- AgriScience (AgriBio)
- Business & Personal Law
- Business Ownership
- Forensic Investigations Advanced
- Water & Your Environment

### Partial Technical Programs

(90 or 150 minutes, 1 Semester)

- Accounting & Finance 1a (90 minutes)
- Accounting & Finance 1b (90 minutes)
- Pre-Law 1a (Semester 1) by teacher permission only.
- Pre-Law 1b (Semester 2) by teacher permission only.
- Theater Arts 1a (Semester 1 only, 90 minutes)
- Theater Arts 1b (Semester 2 only, 150 minutes)

### Academic Courses

(One Credit, 90 Minutes, One Semester)

- Tech English I (11-12th grade- Must be in a Tech program)
- Tech English II (12th grade- Must be in a Tech program)

**NON DISCRIMINATION STATEMENT:**  
 The Southwest Vermont Career Development Center is committed to maintaining a learning environment free from discrimination on the basis of race, color, national origin, religion, sex, disability, or sexual orientation. Rev. 12/8/2006 & 2010