Inside The CAD Academy you will uncover a wealth of instructional resources to help introduce students to engineering and architectural design/drafting principles and industry leading software tools that they will need for further education or industry success. These resources are industry and classroom tested with instructional materials including practical problems, lesson plans, PowerPoint’s, review questions, supplemental e-resources, and real world project based tutorials. The CAD Academy curriculum brings together some of the foremost drawing and design authors to teach a foundation of engineering and architecture concepts that integrate basic math and science principles. Instructors are encouraged to integrate The CAD Academy curriculum resources into their existing curriculum which they have been successfully teaching over time.

This document’s purpose is to provide an overview of the main resources included in The CAD Academy suite. For recommendations on how to implement these resources see “Resource Guide.”
Section 1:
A+CAD CD Resources: Fundamentals of Design Drafting

Most schools use a basic CAD tool to teach the entry students design and drafting. Because of this, we recommend the use of A+CAD as the entry drafting/CAD tool. As students learn the universal basics of drafting and design they will be introduced to A+CAD which offers the familiar AutoCAD® user-interface, functionality, and compatibility. To learn the essentials of A+CAD a digital text entitled The Basics of A+CAD will help students become efficient in using the basic commands and applications of A+CAD.

The CAD Academy A+CAD resources were created by industry representatives and edited by successful instructors for educational application. The first of the A+CAD is the fundamentals of design drafting which is designed to assist students in learning and developing a core knowledge of design/drafting and skill-building procedures. Exercises progress from simple to more complex, propelling students to hands-on skills while promoting creativity. The fundamentals of design drafting curriculum are intended to be a student’s introduction to design and drafting.

This resource along with ADDA exam review guides are provided to help prepare students for the industry recognized ADDA certification help them start preparing for the ADDA certification exam. This resource is found on the A+CAD Curriculum CD in printable PDF form. Additional resources to teach the basics of design and drafting, please refer to the Engineering Drawing & Design, Architectural Drafting & Design texts and electronic resources.

Exploring Civil Engineering is a simple introduction to the world of civil engineering and an understanding to the impact it has on society. Exploring Civil Engineering provides a basic concepts and simple principles to real life practices in civil engineering. The project will enable your students to become familiar with the design process that is utilized for an on-site infrastructure project. Exploring Civil Engineering uses the A+CAD software technology as the tool to draw the engineering plans for this project.

This is the first time a text has been produced to show how to do a complete set of building documents in CAD. The Residential Design Process is a student’s guide to learning the step by step process of designing a residential home. The content within this text is intended to the intermediate level student. This design process begins with the civil site plan and moves forward to the floor/framing, then through the plumbing and electrical plans.
Section 2: 
Google SketchUp Pro & SU Podium DVD Resources

The new innovative design technology Google SketchUp Pro should be integrated in the early learning model of students. However, because Google SketchUp Pro is meant for the early conceptual design, sketching, and visualization stages; students should first be introduced to a basic CAD program (A+CAD) to learn the fundamentals of drafting.

3D+ Google SketchUp Pro video based tutorials that provide step by step training instructions to learn the simple yet robust tool-set with an intelligent drawing system that streamlines and simplifies 3D design. These videos will teach students how to import and export drawings, design, build, and modify 3D models quickly and easily. Videos also teach how to place your models in Google Earth and share them with the world using the Google 3D Warehouse. Various interactive self paced tutorials also ensure students learn the power of this technology and how to implement it in designing creating.

SU Podium curriculum includes step by step tutorials in PDF form for photo-real rendering with interior and exterior models. In addition, videos will be included to demonstrate how to use the simple interface in creating simple to advanced renderings. These video tutorials help students understand shading concepts and how to utilize Omni lighting.

With each set of media a printed Google SketchUp 6 Workbook written by the popular author Bonnie Roskes, P.E is provided. This guide will familiarize Google SketchUp users with the basic tools and features of this highly-acclaimed modeling application. Clearly illustrated, detailed exercises walk you through step by step modeling tools, including components, groups, textures, exact dimensions, Google Earth, and much more. Students apply and build “do-it-yourself” projects with easy to follow tutorials, combined with numerous tips and tricks.
Section 3: Architectural Drafting and Design

The architectural focus of the curriculum utilizes the text entitled Architectural Drafting and Design by Alan Jefferis & David A. Madsen to teach the discipline of architecture. This text is practical and easy to understand, yet very comprehensive in scope. Content follows a logical sequence of learning activities for residential and light commercial architectural drafting and design, or the content may be rearranged to accommodate specific class objectives. Each instructor will receive a physical copy of this text, the solutions manual, and additional e-resources.

Institutions that utilize the architectural curriculum will find lesson plans and content to support a pre-architectural program. Instructors may easily condense the lesson plans to customize the objectives and content for programs of one to two year duration or implement existing curricula. E-resources are CD-ROM’s that contain tools and instructional resources that link to the text’s content to enrich the student’s classroom experience and make the instructor’s preparation time shorter. E-resources include:

- Syllabus
- Chapter hints
- PowerPoint presentations
- Exam View computerized test bank
- Drawing files (DWG)
- Video animation resources
- Text’s Image Library

As students learn the fundamentals of architectural drafting, it is recommended that instructors utilize the most comprehensive and industry-leading architectural software technology called ArchiCAD to create their Virtual Building™ also referred to as Building Information Modeling (BIM). ArchiCAD exercises and tutorials are linked to sections in the Architectural Drafting and Design text. For detailed information of how the ArchiCAD technology is linked with the Architectural Drafting and Design text see the insert inside the front cover of the text.
Section 4: ArchiCAD DVD Resources

The ArchiCAD Building Information Modeling (BIM) lecture notes will advance the minds of instructors and students to the future of architectural design. The BIM Lecture Notes will discuss the evolution of 2D and future of 3D CAD and how BIM is beginning to evolve the future of engineering and architectural design industry. The BIM Lecture Notes are also available in PowerPoint presentations. This resource is found on the ArchiCAD Curriculum DVD in printable PDF form.

ArchiCAD curriculum includes an Interactive Training Guide which is a PDF guide that can be printed and all the narrated movie clips can be launched from the PDF. However, it recommended that you play the movie clips within ArchiCAD, while completing the steps using the training project files. This interactive training guide was written for the beginning user to provide step by step instructions to build a basic architectural project while learning to use the ArchiCAD software. This resource is found on the ArchiCAD Curriculum DVD in printable PDF form.

ArchiCAD Studio Lessons allow students to get to know the Virtual Building concept behind ArchiCAD as well as exploring the application interface and finding out how to use ArchiCAD throughout the whole design-documentation process. This lesson will provide an example project of a multi-story office building from which a student will design from scratch. The Studio Lessons will begin with the construction of the base grid, create the two towers and place slabs between the stories. This resource is found on the ArchiCAD Curriculum DVD in printable PDF form.

BIM Experience Kit is an Interactive Training Guide to help provided students with step by step instructions to build the Massaro House, using ArchiCAD’s BIM architectural environment. Frank Lloyd Wright designed this project to accentuate a specific New York island in 1950. The Massaro’s ran the plans by a Frank Lloyd Wright expert architect, Thomas A. Heinz, AIA, who used ArchiCAD to create the construction documentation based on Wright’s 5 original pencil drawings.

With each set of media a printed copy of the Step by Step ArchiCAD Training Guide will be provided for instructors to learn the technology created by the well known author Thomas M. Simmons. This ArchiCAD Step by Step Training Guide comes with two levels of learning. The first level teaches the basics of ArchiCAD using a residential project while the second level teaches the application of ArchiCAD in construction documents using a commercial project.
Section 5: Engineering Drawing and Design

The mechanical focus of the curriculum utilizes the text entitled Engineering Drawing and Design by David A. Madsen, David P. Madsen, & J. Lee Turpin to teach the discipline of mechanical engineering. Educators have used this relied-on resource for more than twenty years for its easy-to-read, A-to-Z coverage of drafting and design instruction that complies with industry standards. The context of the mechanical curriculum is creative problem solving and applied math and science.

Institutions that utilize the mechanical curriculum will find lesson plans and content to support a comprehensive pre-mechanical program. Instructors may easily condense the lesson plans to customize the objectives and content for programs of one to two year duration or implement existing curricula. E-resource is a CD-ROM containing tools and instructional resources that link to the text’s content to enrich the student’s classroom experience and make the instructor’s preparation time shorter. E-resources include:

- Syllabus
- Chapter hints
- PowerPoint presentations
- Exam View computerized test bank
- Drawing files (DWG)
- Video animation resources
- Text’s Image Library

As students learn the fundaments of mechanical engineering, they will use the industry-leading 3D solid-modeling technology with SolidWorks. SolidWorks exercises and built-in tutorials are linked to sections in the Engineering Drawing and Design text. By integrating parametric solid modeling technology, SolidWorks curriculum and courseware materials provide instructional resources for teaching and learning 3D design with engineering and analysis concepts. For detailed information of how the SolidWorks software is integrated with the Engineering Drawing and Design see the insert inside the front cover of the text.
Section 6: SolidWorks DVD Resources

The SolidWorks curriculum helps integrates the parametric solid modeling technology, and helps students advance their learning into the exciting real world of 3D. SolidWorks curriculum contains a variety of exercises to develop your students’ engineering, science, mathematics, and technology competencies. Whether it’s a 40-minute lecture, two-week project, semester-long course, or a full-year program, the SolidWorks and COSMOS Tutorial curriculum and courseware give you flexible teaching tools. No matter what your grade level or subject, SolidWorks software helps your students learn and understand the fundamentals of design, engineering, and analysis.

SolidWorks and COSMOS resources provide approximately 80 step-by-step tutorials that guide students through the fundamental concepts of modeling. Located in the Help menu, these electronic tutorials require no printing. Students can be assigned 30 to 90-minute lessons in a classroom setting or independently. Lessons cover analyses, such as linear stress, parameters and design scenarios, shape optimization, temperature distribution, frequency, and fatigue.

SolidWorks & Cosmos Teacher and Student Guides feature lessons that correspond to the SolidWorks Online Tutorials. The SolidWorks Guide offers a fully reproducible, 500-page document that incorporates lesson plans, PowerPoint® presentations, student goals, vocabulary, and answers to student assessments. Other exercises stimulate students’ imaginations with real-world applications. The Cosmos Teacher and Student Guide provides additional introductions to principles of design and analysis.

Other SolidWorks design projects include:

- The Bridge Design Project helps you learn the principles of structural analysis using SolidWorks and COSMOSXpress as an integral part of a creative and iterative design process. You will be learning by doing as you complete a structural analysis.

- The CO2 Car Design Project helps students learn principles by doing as they complete the following phases of the project: aerodynamic testing/performance/control, virtual wind tunnel testing, fully detailed drawings of car design, exploded view assembly drawing, complete with a bill of materials and create a photorealistic rendering of final car design.


Additional Solidworks STEM based curriculum is available online as resources for instructors as they incorporate the practical applications of Science, Technology, Engineering, and Mathematics to real world projects.

With each set of media a printed copy of 3D CAD for SolidWorks 2007 text will be included for instructors to learn the technology created by the renowned SolidWorks authors David Planchard & Marie Planchard. 3D CAD for SolidWorks is written to assist students, designers, engineers and professionals. The book provides an introduction to the user interface, menus, toolbars, concepts and modeling techniques of SolidWorks to create parts, assemblies and drawings. Follow the step-by-step instructions and develop multiple assemblies that combine over 80 extruded machined parts and components. In addition, a multi-media CD is included with 2 hours of flash movie files that follow the steps in the book.
Section 7: Discovery Channel

The CAD Academy has partnered with the Discovery Channel to bring to life the inspiring documentaries of today and tomorrow’s engineering marvels. The minds of student’s will be opened to the endless career paths available in the world of engineering, architecture, and design. The Discovery Channel has developed the video series called “Extreme Engineering”, which unveils some of the most ambitious architectural and engineering plans of our times. Some are theoretical; others are in the works. But all of these modern marvels pose challenges that stretch the definition of what’s possible. Watch as jaw-dropping computer animation and first-hand accounts from builders, designers and engineers breathe life into the most extreme construction projects ever conceived in an 8-series compilation, including (Building Hong Kong’s Airport, Boston’s Big Dig, Tunneling Under the Alps, etc…). Lesson plans have been developed to teach students creative problem solving, team building, and developing the thought process of an engineer.

Additional educational resources from Discovery School will provide The Science of Structures DVD which correlates with national educational standards.
Section 8: Industry Certification

The CAD Academy offers many curriculum resources which are approved by the American Design Drafting Association (ADDA) and prepares students for the ADDA certification exam. The ADDA is recognized as the premier design drafting organization by many organizations, including U.S. Department of Labor, U.S. Department of Education, and ASME – American Society of Mechanical Engineers. It’s supported by major U.S. industries and governmental groups like Boeing Corporation, NASA—National Aeronautics and Space Administration, and U.S. Corp. of Engineers. The ADDA offers industry recognized certification examinations for instructors and students and provides guidance and direction to keep educational programs updated to current national and international standards. For more information on the ADDA industry certification programs visit: http://www.adda.org/

Coming Fall 2008 the ADDA will be offering its new apprentice engineering/architecture certification program focused on high school students which has many mathematical based problems.

SolidWorks Corporation offers the Certified SolidWorks Associate (CSWA) Program to provide students an opportunity to demonstrate their proficiency in levels of 3D CAD as it applies to engineering fields. For more information on the SolidWorks certification program visit: www.solidworks.com/cswa

Graphisoft currently provides various levels of certification for ArchiCAD technology and coming soon is the first ever Building Information Modeling (BIM) exam for architecture. For more information on the ArchiCAD competency program visit: http://www.graphisoft.com/community/certification/

The CAD Academy encourages students and instructors to work towards industry certification for recognition beyond the doors of educational institutions.