

The Illinois School for the Deaf
Technology and Engineering Education (Industrial) Program of Study
Manufacturing
Cabinetmaking and Millwork
June 2, 2015

Introduction

Career Pathways in Manufacturing at the secondary level at the Illinois School for the Deaf (ISD) provide preparation for a variety of occupations and assist students with developing skills for employment and community. The targeted occupations require product knowledge and skills and technology expertise that takes into consideration specialized technology and assistive devices for individuals with hearing loss in addition to excellent human relation skills. The Technology and Engineering program which concentrates on cabinetmaking and millwork covers occupations in a wide array of areas, including: Cabinetmakers, millwrights, bench carpenters, and veneer and plywood manufacturing

ISD's programs in Technology and Engineering Education, Cabinetmaking and Millwork, prepare students for employment in entry level occupations and further career preparation at the postsecondary level. Some students may choose to enter a career right out of high school whereas others may decide to further their education before entering a career. The Technology and Engineering Education, Cabinetmaking and Millwork program prepares students for lifelong learning. The tasks, skills and standards identified by business and industry as necessary for success in these occupations are used as the basis for the instructional program development. To assist students in achieving success in their chosen careers, the ISD Technology and Engineering Education, Cabinetmaking and Millwork programs emphasize the development of skills and knowledge that are transferable to a variety of settings. Additionally, students acquire the competencies and strategies necessary to improve the quality of life in their homes, communities and workplaces and to prepare them to become self-supporting citizens.

The following job outlook for occupations in Technology and Engineering Education, Cabinetmaking and Millwork were summarized from information provided by the Occupational Outlook Handbook. This information was updated in 2012. Jobs in carpentry are projected to increase by 24% from 2012-2022 which is much faster than the average for all occupations. An increased level of new home building and remodeling activity will require more carpenters. Jobs in woodworking are projected to increase by 8% from 2012-2022 which is about as fast as the average for all occupations. Those who have advanced skills should have the best job opportunities in manufacturing industries.

ISD developed its Technology and Engineering Education, Cabinetmaking and Millwork program from statewide labor market information (LMI). Occupations with related skills have been grouped together to develop instructional programs which provide students with a wide range of opportunities for entry-level employment, career advancement and further education. As new occupations emerge and employment needs are demonstrated, additional programs will be developed. The ISD Technology and Engineering Education, Cabinetmaking and Millwork program includes the following areas:

- Cabinetmaking and Millwork

The Technology and Engineering Education, Cabinetmaking and Millwork program prepares students for assuming the multiple roles of being a wage earner and community member. The program focuses on time management, work ethic, safety and how to adapt to the ever changing field of manufacturing.

ISD follows a planned sequence of courses in its Technology and Engineering Education, Cabinetmaking and Millwork program. The content and learning experiences are defined in subject-specific course descriptions. ISD offers two semesters for each course rather than the one semester recommended because generally students who are deaf or hard of hearing face academic challenges and require additional time to learn the skills necessary for these courses. These skills must be formally taught. Because of the intense nature of the teaching, more time is required to cover the course content.

Components of ISD's Secondary Technology and Engineering Education, Cabinetmaking and Millwork Program of Study

ISD's program includes the following components in its instructional programs.

1. Qualified, Certified Professional Educator—ISD's educator and instructor are fully qualified and certified as secondary Career Technical Education educator and possesses non-teaching work experience.
2. Student Services--ISD employs appropriate support services and these services are available to all students in the Technology and Engineering Education, Cabinetmaking and Millwork program. Students at ISD have Individualized Education Plans (IEPs); individualized career plans; and individual advisement by the educator and counselor on a regular basis.
3. Sequentially Structured, Aligned Programs--The instruction in the Technology and Engineering Education, Cabinetmaking and Millwork program is based on worker competencies and includes the skills, knowledge and attitudes required for successful employment in the occupations served by the program. Programs include practical, logical, sequentially structured courses and are aligned with the Illinois Learning Standards, Common Core Standards, and utilizing resources aligned with the National Center for Manufacturing Education and Research.
4. Active Career and Technical Education Student Organizations – ISD is investigating the possibility of establishing a vocational organization for students

- in the Technology and Engineering Education, Cabinetmaking and Millwork program of study.
5. Facilities and Equipment—the facilities and equipment used in teaching the Technology and Engineering Education, Cabinetmaking and Millwork program is appropriate for the students enrolled in the program. It is adequately designed, installed and maintained to ensure safe operation and use. There is appropriate instructional and storage space. Students participate in hands-on experiences in classroom and shop areas. Students also have the opportunity for job shadowing experiences and student work experiences.
 6. Active CTE Advisory Council—ISD has a CTE Advisory Council that meets annually in the fall and spring. Meetings and smaller meetings of the whole will continue to meet and provide direction and support for development and evaluation of instructional programs. Membership of the committee is comprised of employers/employees, students, educators, instructors, DRS staff, LLCC staff, ISBE staff, and community members.

Technology and Engineering Education, Cabinetmaking and Millwork Course Structure

Orientation-level courses introduce students to all aspects of architecture and construction and serve as a background for all Technology and Engineering Education, Cabinetmaking and Millwork classes offered. This comprehensive course, Introduction to Technology and Engineering (Industrial), is a two semester course which is generally offered to 9th grade students and older without a background in technology and engineering. This orientation course exposes students to the resources, technical processes, industrial applications, technological impact and occupations encompassed by that system and allow the students to make meaningful decisions regarding further Technology and Engineering Education, Cabinetmaking and Millwork occupational studies.

Preparation-level courses provide students with experiences that support the acquisition of occupational standards and skills required for developing independent skills and employment. The 10th, 11th, 12th, and Transition grade preparation-level courses provide students with the opportunity to develop marketable job skills as well as preparation for further postsecondary training. All Technology and Engineering Education, Cabinetmaking and Millwork programs include logical, practical, sequential learning experiences for the essential technical skills and are designed to achieve that goal. The goal of ISD is to collaborate with postsecondary programs in order to complete the full scope of instruction.

ISD provides classes that utilize work-sites that give real life experience in Technology and Engineering Education, Cabinetmaking and Millwork areas. The structure and content of the courses follows child labor laws and state rules and regulations. Examples of Technology and Engineering Education, Cabinetmaking and millwork work sites are: carpentry occupations, community projects, and manufacturing industries.

Technology and Engineering Education, Cabinetmaking and Millwork

This program offers a sequence of planned educational classroom and laboratory experiences including career exploration, record keeping, content knowledge, practical work experiences provided by ISD staff and stakeholders.

Emphasis is placed on developing competencies in the following areas:

- Work place/employability skills
- OSHA Safety
- Content knowledge

ISD Technology and Engineering Education, Cabinetmaking and Millwork Program of Study Sequence

Orientation Courses

ISBE Course Number	Course Title	Credits Per Semester	Semester Length	Grade Levels
21052A002	Introduction to Technology & Engineering Industrial	0.5	2	9, 10, 11, 12, & TLP

Preparation Courses

ISBE Course Number	Course Title	Credits Per Semester	Semester Length	Grade Levels
17007A001	Cabinetmaking & Millwork I	0.5	2	10,11,12, TLP
17007A002	Cabinetmaking & Millwork II	0.5	2	11,12, TLP

Student Work Experience

ISBE Course Number	Course Title	Credits Per Semester	Semester Length	Grade Levels
22206A000	Life Skills	0.5	2	11
22208A000	**Consumer Family Living	0.5	2	12
22210A000	**Consumer Economics/Personal Finance	0.5	2	12
22152A000	Transition Employability Skills	0.5	2	TLP
22998A000	Student Work Experience	0.5	2	12, TLP

** Students will be enrolled in either Consumer Family Living or Consumer Economics/Personal Finance during their 12th grade year.

Course Descriptions for the listed classes are in Appendix A.

Curricular Outlines for the listed classes are in Appendix B.

APPENDIX A – COURSE DESCRIPTIONS

Course Title: Introduction to Technology & Engineering Industrial (ISBE# 21052A002)

Course Description: Introduction to Technology & Engineering is comprised of the following areas: Production, Transportation, Communication, Energy Utilization and Engineering Design but is not limited to these areas only. This course will cover the resources, technical processes, industrial applications, technological impact and occupations encompassed by that system. Student will have opportunity to explore through OSHA Training and earn certification. This is a two semester course.

Course Title: Cabinet Making and Millwork I (ISBE Course Code # 17007A001)

Course Description: This course introduces students to the basic design and fabrication of residential cabinetry and custom furniture. The course also exposes students to the millwork and millwright industry. Instruction includes safety practices in using hand tools and power equipment. This is a two semester course.

Course Title: Cabinet Making and Millwork II (ISBE Course Code # 17007A002)

Course Description: . This course provides learning experiences related to the erection, installation, and maintenance of commercial and residential cabinetry, and the repair and maintenance of stationary woodworking machinery. Planned learning activities emphasize the development of more advanced knowledge and skills than those provided in Cabinetmaking and Millwork I. This course provides the student with the knowledge and skills necessary to perform basic cabinetry construction and how it relates to the manufacturing process. In addition, more advanced woodworking machine maintenance skills are introduced. This is a two semester course.

Course Title: Student Work Experience (ISBE # 22998A000)

Course Description: Workplace Experience courses provide students with work experience in a field related to their interests. Goals are typically set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses may include classroom activities as well, involving further study of the field or discussion regarding experiences that students encounter in the workplace.

Appendix B – Course Outline

Introduction to Technology and Engineering (Industrial)

Topic	Length of Unit (Time) in weeks	MATH CCSS Standards
OSHA	10 weeks	G.MG.1;7.G.6;N.Q.1
Introduction to Measurement reading	1 week	G.MG.1;7.G.6;N.Q.1
Measurement skill practice lab	2 weeks	G.MG.1;7.G.6;N.Q.1
Shop safety	1 week	G.MG.1;7.G.6;N.Q.1
Hand tools	1 week	G.MG.1;7.G.6;N.Q.1
Machine tools	1 week	G.MG.1;7.G.6;N.Q.1
Assess student operation of machines (no power)	1 week	G.MG.1;7.G.6;N.Q.1
Introduction to Plastic	1 week	G.MG.1;7.G.6;N.Q.1
Plastic lab	3 weeks	G.MG.1;7.G.6;N.Q.1
Introduction to Wood	1 week	G.MG.1;7.G.6;N.Q.1
Wood lab	5 weeks	G.MG.1;7.G.6;N.Q.1
Introduction to Vending machine	1 week	G.MG.1;7.G.6;N.Q.1
Vending machine Lab	3 weeks	G.MG.1;7.G.6;N.Q.1
Introduction to vinyl decals	1 week	G.MG.1;7.G.6;N.Q.1
Vinyl decals lab	3 weeks	G.MG.1;7.G.6;N.Q.1
Final review/wrap up	1 week	G.MG.1;7.G.6;N.Q.1

Cabinetmaking & Millwork I

Topic	Length of Unit (Time) in weeks	MATH CCSS Standards
Shop rules and General safety	1 week	G.MG.1, 7.G.6, N.Q.1
Intro to lumber species	1 week	G.MG.1, 7.G.6, N.Q.1
Calculating board feet & measuring	3 week	G.MG.1, 7.G.6, N.Q.1
Blueprint reading	1 week	G.MG.1, 7.G.6, N.Q.1
Dimensional lumber and plywood	1 week	G.MG.1, 7.G.6, N.Q.1

Glues and Fasteners	1 week	G.MG.1, 7.G.6, N.Q.1
Tool identification	1 week	G.MG.1, 7.G.6, N.Q.1
Machine safety and operation procedure	3 weeks	G.MG.1, 7.G.6, N.Q.1
Safety tests	1 week	G.MG.1, 7.G.6, N.Q.1
Types of joinery	1 week	G.MG.1, 7.G.6, N.Q.1
Joinery Lab	2 weeks	G.MG.1, 7.G.6, N.Q.1
Finishing	2 weeks	G.MG.1, 7.G.6, N.Q.1
Cabinetry & custom furniture lab	17 weeks	G.MG.1, 7.G.6, N.Q.1
Post tests	1 week	G.MG.1, 7.G.6, N.Q.1

Cabinetmaking & Millwork II

Topic	Length of Unit (Time) in weeks	MATH CCSS Standards
Shop Rules and general safety	1 week	G.MG.1, 7.G.6, N.Q.1
Calculating board feet and measuring	2 weeks	G.MG.1, 7.G.6, N.Q.1
Machine safety and operation procedure	2 weeks	G.MG.1, 7.G.6, N.Q.1
Machine Maintenance, setup, & trouble shooting	3 weeks	G.MG.1, 7.G.6, N.Q.1
Dado & rabbet joinery	1 week	G.MG.1, 7.G.6, N.Q.1
Mortise & tenon joinery	2 weeks	G.MG.1, 7.G.6, N.Q.1
Face frame layout and construction	1 week	G.MG.1, 7.G.6, N.Q.1
Drawer construction and layout	3 weeks	G.MG.1, 7.G.6, N.Q.1
Raised Panel door construction	3 weeks	G.MG.1, 7.G.6, N.Q.1
Cabinetry and Custom furniture lab	16 weeks	G.MG.1, 7.G.6, N.Q.1
Cabinetry Installation and layout	2 weeks	G.MG.1, 7.G.6, N.Q.1
Post test	1 week	G.MG.1, 7.G.6, N.Q.1