

**The Illinois School for the Deaf  
Technology and Engineering Education (Industrial) Program of Study  
Architecture and Construction  
Construction Trades, General  
June 1, 2015**

Introduction

Career Pathways in Architecture and Construction 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 Construction Trades covers occupations in a wide array of areas, including: surveying and mapping technicians, carpenters, woodworkers, construction laborers/helpers, and drywall installers.

ISD's programs in Technology and Engineering Education, Construction Trades, 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, Construction Trades 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, Construction Trades 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, Construction Trades was 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. Jobs in the field of construction laborers/helpers are projected to grow 25% from 2012-2022 which is much faster than the average for all occupations. Laborers and helpers work in all fields of construction, and the demand for these workers reflect the level of overall construction activity.

ISD developed its Technology and Engineering Education, Construction Trades 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, Construction Trades program includes the following areas:

- Construction Trades, General

The Technology and Engineering Education, Construction Trades 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 construction.

ISD follows a planned sequence of courses in its Technology and Engineering Education, Construction Trades 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, Construction Trades 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. The instructor is also a member of the United Brotherhood of Carpenters and Joiners of America Carpenters Union.
2. Student Services--ISD employs appropriate support services and these services are available to all students in the Technology and Engineering Education, Construction Trades 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, Construction Trades 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 Construction 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, Construction Trades program of study.
  5. Facilities and Equipment—the facilities and equipment used in teaching the Technology and Engineering Education, Construction Trades 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 business members.

#### Technology and Engineering Education, Construction Trades 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, Construction Trades classes offered. This comprehensive course, Introduction to Technology and Engineering (Industrial), is a two semester course which is generally offered to 9<sup>th</sup> 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, Construction Trades 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 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 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, Construction Trades 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, Construction Trades areas. The structure and content of the courses follows child labor laws and state rules and regulations. Examples of

Technology and Engineering Education, Construction Trades work sites are: carpentry occupations, community projects, and construction companies.

### **Technology and Engineering Education, Construction Trades**

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, Construction Trades Program of Study Sequence**

#### Orientation Courses

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

#### Preparation Courses

<b>ISBE Course Number</b>	<b>Course Title</b>	<b>Credits Per Semester</b>	<b>Semester Length</b>	<b>Grade Levels</b>
17002A001	Construction Trades I	0.5	2	10,11,12, TLP
17002A002	Construction Trades II	0.5	2	11,12, TLP

#### Student Work Experience

<b>ISBE Course Number</b>	<b>Course Title</b>	<b>Credits Per Semester</b>	<b>Semester Length</b>	<b>Grade Levels</b>
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 12<sup>th</sup> 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:** Construction Trades I (ISBE Course Code #17002A001)

**Course Description:** This course provides experiences related to the erection, installation, and maintenance of residential buildings and related fixtures. Planned learning activities allow students to understand fundamental principles and methods, and develop technical skills related to masonry, carpentry, and finish work. Instruction includes safety principles and practices, recognition of standard lumber sizes, foundation layout methods, building concepts and procedures, local, state, and national codes, cost estimating, and blueprint reading.  
This is a two semester course.

**Course Title:** Construction Trades II (ISBE Course Code #17002A002)

**Course Description:** This course provides learning experiences related to the erection, installation, maintenance, and repair of building structures and related utilities. Student technical skill experiences include instruction and activities in safety principles and practices, performing maintenance control functions, joining pipes, building water distribution lines and drains, installing and maintaining plumbing fixtures and systems, installing switch and outlet boxes, light fixtures, service entrances, roughing in and trimming out electrical devices and appliances, preparing foundations and footings, constructing residential chimneys and fireplaces, laying, jointing and pointing brick, and advanced building and construction methods and codes. All learning experiences are designed to allow the student to acquire job-entry skills and knowledge. 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

### Construction Trades I

Topic	Length of Unit (Time) in weeks	MATH CCSS Standards
Introduction to Trade	1 week	G.MG.1;7.G.6;N.Q.1
Introduction to Reading plans and Elevations	1 week	G.MG.1;7.G.6;N.Q.1
Introduction to Concrete, reinforcing materials and Forms	1 week	G.MG.1;7.G.6;N.Q.1
Introduction To Building materials, Fasteners and Adhesives	1 week	G.MG.1;7.G.6;N.Q.1

Introduction to Hand and Power tools	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction floor systems	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to wall system	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Wall system Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Thermal and Moisture Protection	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Windows and Exterior Doors	1 week	G.MG.1;7.G.6;N.Q.1
Windows and Exterior Door Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Exterior Finishing	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Exterior Finish Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Electric, Plumbing and HVAC system Layouts settings	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Electric, plumbing and HVAC system setting up Lab	2 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to dry wall	1 weeks	G.MG.1;7.G.6;N.Q.1
Drywall Lab	3 weeks	G.MG.1;7.G.6;N.Q.1
Introduction to drywall finish/paint	1 week	G.MG.1;7.G.6;N.Q.1
Drywall finish/paint Lab	4 weeks	G.MG.1;7.G.6;N.Q.1
Introduction to Trim work	1 week	G.MG.1;7.G.6;N.Q.1
Trim work	3 weeks	G.MG.1;7.G.6;N.Q.1
Review overall project	1 week	G.MG.1;7.G.6;N.Q.1

### **Construction Trades II**

<b>Topic</b>	<b>Length of Unit (Time) in weeks</b>	<b>MATH CCSS Standards</b>
Introduction to Trade	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Site preparing Reading plans and Elevations	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Site preparing Lab	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to properties/reinforcing of	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>



concrete		
Introduction to Foundations and Slab-on-Grade	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Shop Safety	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Hand and Power tools	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Formwork	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Formwork Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Vertical/Horizontal Formwork	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Exterior Details Finish	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Exterior details Finish Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to roof system	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Roof system Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Stairs systems	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Stairs system Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Cabinets	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>
Cabinets Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Finish flooring	1 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Finish flooring Lab	3 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Introduction to Inspection	1 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Inspection Lab	2 weeks	<b>G.MG.1;7.G.6;N.Q.1</b>
Review overall project	1 week	<b>G.MG.1;7.G.6;N.Q.1</b>