



Careers in designing, planning, managing, building and maintaining the built environment.

Pathway: Construction Systems

Inventions and Innovations

Credit: 1
SDE Course Code: 3810
MNPS Course Code: IND8192

Innovations and Inventions will enable students to further develop technological literacy skills and should be offered as an integral component of the core school curriculum. Integrated academics combined with a hands-on program of study that teaches about the development and applications of technology and the effects technology has on individuals, society and the environment. This course integrates the three (3) Gateway courses throughout the learning expectations and is articulated in all of the sample performance tasks.

Technological Systems

Credit: 1
SDE Course Code: 3811
MNPS Course Code: IND3811

This is an overview course designed to introduce students to the application of technology to solve problems and meet human needs and wants. Laboratory experiences are focused on the technology systems of bio-related technology, communication, computer applications, construction, energy, power, transportation, and manufacturing. Students will study concepts about technological systems and the influences these systems have at home, in communities, and at work. The content of the

course includes, but is not limited to, the study of systems of technology, application of technology, design/problem solving, evolving technologies, safety, maintenance, entrepreneurship, leadership, careers, and marketing.

Problems and Solutions in Technology

Credit: 1
SDE Course Code: 3813
MNPS Course Code: IND3813

Problems and Solutions in Technology is a research course which allows students to develop advanced technical knowledge and skills by solving problems in one or more of the technology systems: communication, computer applications, construction, energy, power, transportation, manufacturing, and bio-related technology. In this research course, students develop and apply the knowledge and skills gained in previous courses to identify and resolve relevant problems.

This course is designed to give students the opportunity to synthesize and apply knowledge and skills gained in several courses and apply the skills to new situations. The course integrates mathematics, science, language arts, and social studies competencies in a contextual setting using Project-Based Learning Activities as performance tasks. A culminating research/project report is required to satisfactorily complete this research course.

Engineering Process

Credit: 1
SDE Course Code: 3812
MNPS Course Code: IND3812

This is an overview course that introduces students to the concepts and practices that underlie careers in engineering and engineering technology. The course integrates STEM (Science, Technology Engineering and Mathematics) into pre-engineering activities. Students acquire knowledge and skills in engineering problem solving and explore requirements for engineering careers. The purpose of Engineering Processes is to expose students to project-based learning activities using advanced mathematics, design, pre-engineering concepts, use of time studies and problem solving using both classroom and on-line materials. Students will also be required to perform research and upper level literacy in technology engineering education. This course is designed to provide information and experiences to help students adapt themselves to the workforce and the changing demands that will be placed on the engineering workforce in the 21st century. It will help students develop skills in problem solving, teamwork, time management, computer skills, and engineering systems.

Pathway: Design & Preconstruction

Career Management Success

Credit: ½ - 1
SDE Course Code: 5701
MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools

for achieving success in their academic, work, and personal lives. Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All course content is presented in a real-

world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in other career and

technical youth organizations

Computer Aid Drafting (CAD)
Credit: 1 - 2
SDE Course Code: 5788/3823
MNPS Course Code: VO8531/
IND3823

Engineering Design/CAD is a course in which students learn the basic concepts of scale drawings and orthographic projections by making simple two-and-three-dimensional drawings using manual drafting tools and computer-aided design (CAD). Course content will enable students to make the transition into the use of CAD software by having them make increasingly sophisticated drawings. Students will work in teams and will culminate in a class project to create a complete set of

construction and assembly drawings for a mechanical product.

Advanced Computer Aid Drafting (CAD)
Credit: 1
SDE Course Code: 5789/3824
MNPS Course Code: VO8431/
IND3824

CAD is a course in which students will learn to use a CAD program to create engineering drawings including: plan drawings, assembly drawings, welding and process drawings, cross sections, 3D representations and bills of materials. This course consists primarily of individual drawing projects with some group projects. Emphasis is on drawing projects of increasing complexity.

Principles of Engineering

Credit: 1
SDE Course Code: 5784 or 3820
MNPS Course Code: VO8150 or
IND3820

Principles of Engineering is a course in which students explore the nature of engineering and the skills fundamental to all engineering fields, as well as the role of quality-assurance and quality control procedures in manufacturing. Emphasis is placed on actual projects and presentations and the use of modern tools (e.g., CAD). The course can be enhanced by cooperation with local manufacturing facilities, which can provide real measurement data and opportunities for on-site visits to witness engineering tasks and projects, and quality-control data collection.

Pathway: Construction Electrical

Career Management Success
Credit: ½ - 1
SDE Course Code: 5701
MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools for achieving success in their academic, work, and personal lives. Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All course content is presented in a real-world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in other career and technical youth organizations.

Construction Core
Credit: 1
SDE Course Code: 5730
MNPS Course Code: VO8714

Construction Core is a course that will introduce students to basic skills and knowledge applicable to all construction trades. Topics covered include safety, construction drawings, site layout, hand and power tools, linear and angular measurements, and application of algebraic and geometric principles to construction problems.

Electrical I
Credit: 1 - 2
SDE Course Code: 5733
MNPS Course Code: VO5733

Electrical I will provide basic skills and knowledge related to residential and commercial electrical systems. Course content includes leadership development, safe practices, Ohm's law, installing conduit, conductors, residential and commercial electrical systems and services according to National Electrical code (NEC) and

local codes. This course gives students an introduction to the skill and knowledge base typically required for apprentice electricians.

Electrical II
Credit: 1 - 2
SDE Course Code: 5734
MNPS Course Code: VO5734

Electrical II is a course in which students will learn and practice intermediate skills related to electrical systems, with emphasis on commercial systems. Topics covered include over current protection; sizing conductors; lighting systems; three-phase motors; motor control circuits; sizing raceways, boxes, and fittings; and connecting distribution transformers, including a laboratory experience conducted in a shop environment that supports electrical assembly projects by students. This course gives students a substantial skill and knowledge foundation typically required for apprentice electricians.

Pathway: Construction Concrete

Career Management Success
Credit: ½ - 1
SDE Course Code: 5701
MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools for achieving success in their academic, work, and personal lives.

Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All

course content is presented in a real-world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in other career and technical youth organizations.

Construction Core

Credit: 1

SDE Course Code: 5730

MNPS Course Code: VO8714

Construction Core is a course that will introduce students to basic skills and knowledge applicable to all construction trades. Topics covered include safety, construction drawings, site layout, hand and power tools, linear and angular measurements, and application of algebraic and geometric principles to construction problems.

Concrete I

Credit: 1 - 2

SDE Course Code: 5737

MNPS Course Code: VO5737

Concrete I is a course that will introduce students to basic skills and knowledge related to reinforced concrete construction in residential and commercial structures. Topics covered include safe practices, drawing interpretation, composition of concrete, principles of reinforcement, form construction, load analysis, and placing, curing and testing concrete. This course gives students an introduction to the skill and knowledge base typically required for apprentice concrete artisan.

Concrete II

Credit: 1 - 2

SDE Course Code: 5738

MNPS Course Code: VO5738

Concrete II is a course in which students will learn and practice intermediate skills related to reinforced concrete construction in residential and commercial structures. Topics covered include safe practices, advanced construction drawing interpretation and site layout, lightweight concrete, design of concrete mixes, design of reinforced concrete members. This course gives students a substantial skill and knowledge foundation typically required for apprentice concrete artisans.

Pathway: Construction Plumbing

Career Management Success

Credit: ½ - 1

SDE Course Code: 5701

MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools for achieving success in their academic, work, and personal lives. Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All course content is presented in a real-world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in

other career and technical youth organizations.

Construction Core

Credit: 1

SDE Course Code: 5730

MNPS Course Code: VO8714

Construction Core is a course that will introduce students to basic skills and knowledge applicable to all construction trades. Topics covered include safety, construction drawings, site layout, hand and power tools, linear and angular measurements, and application of algebraic and geometric principles to construction problems

Plumbing I

Credit: 1 - 2

SDE Course Code: 5739

MNPS Course Code: VO5739

Plumbing I is a course that will introduce students to basic skills and knowledge related to residential and light commercial plumbing. Topics covered include water distribution processes, installation of hot and cold water systems, and an intro-

duction to drain, waste, vent systems in residential and commercial structures, cutting and fitting pipe, making joints, securing pipe, and roughing in. This course gives students an introduction to the skill and knowledge base typically required for apprentice plumbers

Plumbing II

Credit: 1 - 2

SDE Course Code: 5740

MNPS Course Code: VO5740

Plumbing II is a course in which students will extend their skills and knowledge related to residential and light commercial plumbing. Topics covered include physics principles, fuel piping systems, pressure reducers, backflow prevention devices, troubleshooting and repair, DWV piping, vents, and drainage. This course gives students a substantial skill and knowledge foundation typically required for apprentice plumbers.

Pathway: Construction HVAC/R

Career Management Success
Credit: ½ - 1
SDE Course Code: 5701
MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools for achieving success in their academic, work, and personal lives. Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All course content is presented in a real-world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in other career and technical youth organizations.

Construction Core
Credit: 1
SDE Course Code: 5730
MNPS Course Code: VO8714

Construction Core is a course that will introduce students to basic skills and knowledge applicable to all construction trades. Topics covered include safety, construction drawings, site layout, hand and power tools, linear and angular measurements, and application of algebraic and geometric principles to construction problems

HVAC/R I
Credit: 1 - 2
SDE Course Code: 5741
MNPS Course Code: VO8411

HVAC/R I is a course that will introduce students to basic to entry-level skills and knowledge related to residential and commercial heating, ventilation, air conditioning, and refrigeration (HVAC/R). Topics covered include tools and equipment, safety, hazards unique to HVAC/R work, physics principles, mechanical refrigeration cycle, and installation and servicing of HVAC/R systems. Course content provides students

with skill and knowledge to advance to HVAC/R II. Students completing HVAC/R I will be eligible to take the Core, Type I and Type II technician certification of the EPA Proper Refrigerant Usage and Handling examination.

HVAC/R II
Credit: 1 - 2
SDE Course Code: 5742
MNPS Course Code: VO8511

HVAC/R II is a course in which students will extend their skills and knowledge related to residential and commercial heating, ventilation, air conditioning, and refrigeration (HVAC/R). Topics covered include electricity, thermodynamics, psychometrics, diagnostic, forced air furnaces, air distribution systems, and heating/cooling load analysis. This course gives students a substantial skill and knowledge foundation typically required for apprentice HVAC/R technicians. Course content provides school based and work based learning opportunities for students. Course content prepares students for entry-level employment, advanced training in HVAC/R, and entry into postsecondary education.

Pathway: Construction Wiring

Career Management Success
Credit: ½ - 1
SDE Course Code: 5701
MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools for achieving success in their academic, work, and personal lives. Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All course content is presented in a real-world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in other career and technical youth organizations.

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Construction Core
Credit: 1
SDE Course Code: 5730
MNPS Course Code: VO8714

Construction Core is a course that will introduce students to basic skills and knowledge applicable to all construction trades. Topics covered include safety, construction drawings, site layout, hand and power tools, linear and angular measurements, and application of algebraic and geometric principles to construction problems

Basic Principles of Welding
Credit: 1 - 2
SDE Course Code: 5786
MNPS Course Code: VO5786

Basic Principles of Welding is a course in which students will learn basics skills and knowledge related to cutting and welding applications. Welding and cutting skills will be developed in the context of a series of projects. Combined with the second year course, Welding Applications, the student should be prepared for Entry Level Welding Certification, as defined by American Welding Society QC10.

Advanced Welding Applications
Credit: 1 - 2
SDE Course Code: 5787
MNPS Course Code: VO5787

Advanced Welding Applications* is a course designed to follow Principles of Welding, in which students will learn more advanced techniques and skills related to cutting and welding applications, particularly as they

relate to stainless steel and aluminum. Welding and cutting skills will be developed in the context of a series of projects. Following the completion of this course, the student should be prepared for Entry

Level Welding Certification, as defined by American Welding Society QC10.

Pathway: Construction Carpentry

Career Management Success
Credit: ½ - 1
SDE Course Code: 5701
MNPS Course Code: VOC8160

Career Management Success is a core course for career clusters. The course provides students with tools for achieving success in their academic, work, and personal lives. Course content emphasizes the basic skills and knowledge needed for employment success, as identified by industry and supported by relevant national standards. All course content is presented in a real-world context, providing concrete opportunities for developing personal and career goals, effective communication skills, teamwork abilities, and successful work attitudes. Upon completion of the course, students will be able to complete the Professional Development Program Level I and Level II of SkillsUSA or other degree programs in other career and technical youth organizations.

Construction Core
Credit: 1
SDE Course Code: 5730
MNPS Course Code: VO8714

Construction Core is a course that will introduce students to basic skills and knowledge applicable to all construction trades. Topics covered include safety, construction drawings, site layout, hand and power tools, linear and angular measurements, and application of algebraic and geometric principles to construction problems

Carpentry I
Credit: 1 - 2
SDE Course Code: 5731
MNPS Course Code: VO5731

Carpentry I is a course that will introduce students to basic skills and knowledge related to residential and commercial carpentry. Topics covered include wood, metal, and concrete building materials; fasteners; hand and power tools; fabrication

based on construction plans; and framing of platform and post-and-beam structures, in both wood and metal. This course gives students an introduction to the skill and knowledge base typically required for apprentice carpenters.

Carpentry II
Credit: 1 - 2
SDE Course Code: 5732
MNPS Course Code: VO5732

Carpentry II is a course in which students will extend their skills and knowledge related to residential and commercial carpentry. Topics covered include stairs, installation and trim of windows and doors, installation and repair of gypsum wallboard, advanced site layout, exterior finish work, thermal and moisture protection, and an introduction to welding. This course gives students a substantial skill and knowledge foundation typically required for apprentice carpenters.

Pathway: Interior Design

Family and Consumer Sciences
Credit: 1
SDE Course Code: 5603
MNPS Course Code: FCS8180

Family and Consumer Sciences is a comprehensive, foundation course designed to assist students in developing the core knowledge and skills needed to manage their lives. Emphasis is on leadership, human development, family and parenting education, consumer economics and resource management, housing and living environments, nutrition and foods, textiles and apparel, and career preparation. Critical skills in decision making, problem solving, critical thinking, technology, work and family management, and workplace readiness are reinforced

through authentic experiences. The course allows students to select specific areas for future concentrated study. A unique focus is on the management of families, work, and their interrelationships. The integration of Family, Career and Community Leaders of America (FCCLA) provides students with opportunities for leadership development, personal growth, and school/community involvement.

Consumer Economics
Credit: 1
SDE Course Code: 5605
MNPS Course Code: FCS8780

Consumer Economics is a specialized course designed to prepare students to understand the United States economic system and how it

affects individuals as consumers, producers, and citizens. Students will integrate knowledge, skills, and practices required for management of resources in a technologically expanding global economy. Consumer practices and responsibilities are investigated and skills in planning for financial security are included in the content. Core skills in decision making, problem solving, critical thinking, goal setting, management of multiple roles, and using technology are integrated into course content. The integration of Family, Career, and Community Leaders of America (FCCLA) provides students opportunities for leadership development, personal growth, and school/community involvement.

Housing and Interior Design

Credit: ½ - 1

SDE Course Code: 5607

MNPS Course Code: FCS8689

Housing and Interior Design is a specialized course designed to prepare students to understand the influences affecting housing decisions. The course includes instruction in the social/psychological aspects of housing, the consumer aspects, housing trends and issues, the application of design principles to the living environment, home furnishings and equipment, home care and maintenance, and exploration in related occupations/careers. Emphasis is on using available resources effectively to meet individual and housing needs. The integration of Family, Career and Community Leaders of America (FCCLA) provides students with the opportunity for leadership development, personal growth, and school/community involvement.

Interpersonal Communications

Credit: ½

SDE Course Code: 5608

MNPS Course Code: FCS8686

Interpersonal Communications is a specialized course designed to focus on communications within the areas of personal life, family life, community, and workplace. The role of communication in establishing and maintaining healthy interpersonal relationships is emphasized. Communication skills and core skills in decision making, problem solving, critical and creative thinking, technology, and workplace readiness practiced in this course will empower students to function effectively as a member of a rapidly changing global community. Students will apply skills learned when participating in integrated service learning experiences. This involvement in the community will help students network with adults and establish themselves as valuable resources and community assets.

Career Connections

Credit: ½

SDE Course Code: 5620

MNPS Course Code: FCS8190

Career Connections is designed to provide students with an understanding of how to plan for and manage careers in a continuously

changing workplace. Students will learn the importance of exploring multiple career paths and building on the inter-relatedness between occupations when applying career development strategies throughout the life span. With the recognized relationship between family functioning and work productivity, the family/work connection is emphasized in the content of this course. Instruction will include strategies for engaging in life-long learning, addressing the continuous process of learning new skills, adapting decision-making and problem-solving skills to changing conditions, managing work and family responsibilities, and working with diverse populations. This course will encompass an individual's total lifestyle-education, occupation, social responsibility, and leisure. Involvement in service learning through a related vocational student organization will help students learn about workplace roles, understand employers' expectations, develop realistic ideas about careers, network with adults, and establish themselves as valuable resources and community assets.

Pathway: Landscape Design

Nursery Production

Credit: ½ - 1

SDE Course Code: 5120

MNPS Course Code: AGR8674

Nursery production includes standards that challenge students to plan for needs in the production of ornamental products. As the urban society continues to expand to other regions, nursery production is important to provide aesthetic landscaping for various cultures and desires.

Computer Aided Drafting

Credit: 1 - 2

SDE Course Code: 5788/3823

MNPS Course Code: VO8531/IND3823

Engineering Design/CAD is a course in which students learn the basic concepts of scale drawings

and orthographic projections by making simple two-and-three-dimensional drawings using manual drafting tools and computer-aided design (CAD). Course content will enable students to make the transition into the use of CAD software by having them make increasingly sophisticated drawings. Students will work in teams and will culminate in a class project to create a complete set of construction and assembly drawings for a mechanical product.

Exterior/ Interior Landscaping

Credit: ½ - 1

SDE Course Code: 5113

MNPS Course Code: AGR8673

Exterior/Interior Landscaping includes standards to prepare students for creating aesthetic environments for homes and industries. As the population expands and economies grow, the demand for planned and

creative exterior and interior landscapes increases. The desire for appropriate landscape materials and designs will grow in the 21st century.

Horticulture Technology

Credit: 1

SDE Course Code: 5125

MNPS Course Code: AGR8120

Horticulture Technologies includes standards that challenge students to plan for future food needs, using advanced technologies. These technologies are becoming increasingly important as populations grow and farm land is consumed by this urban growth. Understanding the benefits of these technologies and how to blend their use with environmental conservation is important as we enter the 21st century.