**EMIS Change 26-9**
*This change updates EMIS Manual Section 4.7 Subject Codes. The primary changes being made are to remove the Suggested Subject Area for Credit column and to remove the International Baccalaureate (IB) subject codes.*

*The Suggested Subject Area column is being removed because credit decisions are local decisions based on state standards and what is being taught in the actual course; they should not be based on what is listed in this section of the EMIS Manual. Information about Ohio's Learning Standards can be found on the Department's website. Questions about these standards and about which subject codes may be best for the different standards should be directed to the Office of Academic Success.*

*IB courses are being deleted in order to remove duplicative reporting and improve data quality. The Curriculum Element on the Course Master (CN) Record is the way to indicate that a course is an IB course. There are options for reporting IB ab initio courses, IB higher level courses, and IB standard level courses. There has never been a subject code for every possible IB course; removing these subject codes and directing districts to follow our general subject code guidance—report the subject code that most closely matches the content of the course—allows districts to more precisely and correctly report what is happening in their IB classrooms. See the accompanying document for this change (IB Replacement Suggestions) for guidance on what to report in place of IB subject codes. Please note that these are suggestions only. As always, the district should report the subject code that most closely matches the content of the course.*

*June 9, 2025, update: There were additional updates required to Section 4.2. There was reporting guidance directing attention to the IB subject codes. As this change removes the IB subject codes, that language is being removed or updated. The updates are marked in yellow.*

# SECTION 4.2: COURSE MASTER (CN) RECORD

## ☼ *Curriculum Element*

| | |
|---|---|
| Record Field Number | CN310 |
| Definition | The curriculum source/model/program for a specific course. |

***International Baccalaureate Curriculum Values.*** These curriculum values are for use with ~~subject code~~courses based on the International Baccalaureate curriculum published by the International Baccalaureate Organization (www.ibo.org). As such, they should only be reported by schools approved by IBO.

~~See Section 4.7 Subject Codes for a full list of International Baccalaureate Subject Codes (32xxxx). The following Curriculum Element options may only be used with Subject Codes in the 32xxxx series.~~

IS International Baccalaureate Standard Level
IH International Baccalaureate Higher Level
IA International Baccalaureate AB INITO (Used only with IB Second Language ~~Codes~~courses)

## ☼ *Subject Area for Credit Element*

| | |
|---|---|
| Record Field Number | CN210 |
| Definition | The subject for courses offered in which high school credit toward graduation is being applied, whether at middle school or high school level. |

***Reporting Instructions.*** Report the most specific option that would apply. For example, if a student takes a business course as an elective report the 'BUS' option instead of the 'ELE' option since the 'BUS' option is more specific.

The Subject Area for Credit for each course should be assigned based on the learning standards to which the course is aligned. For detailed information about Ohio's learning standards, see the Department's Learning in Ohio webpage.

# 4.7 Subject Codes

## Academic Content Areas Section

### *Fine Arts Section*

**Table 1. Dance Codes (0803xx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 080312 | **Introduction to Dance**<br>A study of the skills and processes necessary to understand and experience dance as an art form and as a means of meaningful communication. Emphasis is placed on kinesthetic intelligence and the fundamentals of dance and choreography. Study also emphasizes the role of dance throughout history and in different cultures. | ~~FAR~~ | Arts |
| 080315 | **Comprehensive Dance**<br>A comprehensive study of the knowledge and processes of creating, performing, responding to, and representing ideas through the art form of dance. Multiculturalism, art history, art criticism and aesthetics are incorporated into course content and dance experiences for individual and group learning. | ~~FAR~~ | Arts |

**Table 2. Drama/Theatre Arts Codes (050xxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 050337 | **Drama/Theatre in grades K-8**<br>The study of dramatic elements and theatrical techniques, particularly in an improvisational, non-exhibitional, process-centered manner, designed to develop imagination, communication, and expressive skills. | ~~N/A~~ | Arts |
| 050600 | **Theatre Arts**<br>Subject matter and experiences are concerned with a wide range of studies and activities including playwriting, dramatic literature, scene design, technical theatre, acting, directing, and the supporting of arts and crafts of the theatre and of selected aspects of video, radio, television and film. | ~~FAR~~ | Arts |

**Table 3. Music Codes (12xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 122000 | **Music (K-8)**<br>Organized study of the elements and styles of music and the historical, cultural and societal context of music designed for all pupils in grades K-8. | ~~N/A~~ | Arts |
| 120001 | **General Music**<br>Organized subject matter and musical experiences consisting of an extensive and varied study of music designed for all pupils in grades K-12. | ~~FAR~~ | Arts |
| 120300 | **Music Theory**<br>The study of the principles of music, including rudiments, harmony, counterpoint, form and analysis, orchestration and skills such as sight singing, ear training, conducting and composing. | ~~FAR~~ | Arts |
| 120400 | **Vocal/Choral Music**<br>Learning experiences designed for the study of vocal / choral repertoire and the development of vocal / choral skills through solo and ensemble performance. | ~~FAR~~ | Arts |
| 120500 | **Instrumental Music**<br>Learning experiences designed for the study of instrumental repertoire and the development of instrumental skills through solo and ensemble performance. | ~~FAR~~ | Arts |
| 120800 | **Music Appreciation**<br>Organized subject matter and learning experiences designed to further pupils' knowledge, comprehension, and appreciation of various types and styles of music. | ~~FAR~~ | Arts |
| 129999 | **Other Music Course**<br>A music course that is given for high school credit toward graduation that is different in scope from any of the other SUBJECT CODES described above and which addresses important content (knowledge and skills) in the study of music. | ~~FAR~~ | Arts |

**Table 4. Visual Art Codes (02xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 020012 | **Visual Art (K-12)**<br>A study of the knowledge, skills and processes for observing, creating, responding and communicating in ways that are unique to visual art. Art production and the construction of meaning in visual artworks are complimentary learning activities. Course content may include meaningful connections between visual art and other disciplines to enable students to understand art in a broader context. | ~~FAR~~ | Arts |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 020100 | **Art Appreciation**<br>The study of works of visual art from various historical, cultural and social contexts. Instruction addresses multiple strategies for inquiry to enable students to develop and present their own views and responses to specific artworks and to discuss the viewpoints of others. | ~~FAR~~ | Arts |
| 020101 | **Art History**<br>This course examines the reciprocal impact between visual art and historical, cultural, social and political contexts. Key artworks are studied chronologically and thematically with emphasis on subject matter, ideas, and the formal, technical and expressive aspects of the works. | ~~FAR~~ | Arts |
| 020210 | **Design**<br>This course emphasizes study of the elements and principles of art and design. Students explore, organize, and use the elements and principles to create two- and three-dimensional original work in various forms and media. | ~~FAR~~ | Arts |
| 020240 | **Crafts**<br>Students acquire utilitarian skills including weaving, jewelry-making, fabric crafting, basketry, metalsmithing, leather-shaping, and wood-forming. Objects by professional craftspersons are studied for their formal, expressive, and technical qualities. | ~~FAR~~ | Arts |
| 020242 | **Ceramics**<br>Original objects (primary pottery and sculpture) are created with clay using hand building, casting, wheel forming, and glazing techniques. Objects created by professional ceramists are examined for their expressive, formal, and technical qualities. | ~~FAR~~ | Arts |
| 020250 | **Drawing and Painting**<br>Pencil, pen and ink, chalk, charcoal, acrylics, oils, and watercolors are explored to create original personal images. Drawings and paintings by culturally and historically representative artists are examined for their formal, expressive, and technical qualities. | ~~FAR~~ | Arts |
| 020270 | **Photography and Film Making**<br>Still and motion picture camera procedures are investigated along with darkroom developing and printing techniques. The expressive, formal, and technical qualities of professional work are studied. | ~~FAR~~ | Arts |
| 020280 | **Printmaking**<br>Linoleum block printing, woodblock printing, silk-screen printing, and etching are studied as processes for expressing ideas. Professional printmakers' products are also examined. | ~~FAR~~ | Arts |
| 020290 | **Sculpture**<br>Various media such as clay, metal, wood, stone, and wire and various processes such as carving, casting, soldering, and modeling are investigated as means for creating three-dimensional artistic forms. Professional sculptors' works are studied. | ~~FAR~~ | Arts |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 029902 | **Advanced Visual Art**<br>An advanced course of organized subject matter and experiences in art. Works from different cultures and time periods as well as those created by the students are studied. | ~~FAR~~ | Arts |
| 020320 | **Graphic Arts/Unified Arts**<br>Computer design is explored to develop understanding of techniques, processes and possibilities of electronic media to understand, create and appreciate visual art. | ~~FAR~~ | Arts |
| 029100 | **Studio Art – Drawing**<br>A course in drawing for students who are highly motivated and have previous training in art. | ~~FAR~~ | Arts |
| 029110 | **Studio Art – 2D Design**<br>A course in two-dimensional art design for students who are highly motivated and have previous training in art. | ~~FAR~~ | Arts |
| 029120 | **Studio Art – 3D Design**<br>A course in three-dimensional art design for students who are highly motivated and have previous training in art. | ~~FAR~~ | Arts |
| 029999 | **Other Visual Art Course**<br>A course that is given for high school credit toward graduation, but that is different in scope from any of the other SUBJECT CODES described above and which addresses important content (knowledge and skills) in the study of visual art. | ~~FAR~~ | Arts |

## *Business Education Section*

**Table 5. Business Education (Non-Career Technical) Codes (03xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 030100 | **Accounting**<br>Instruction focuses on the management of a company's financial resources including the accounting cycle, financial statements, and interpretation and use of financial data. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS~~ | — |
| 030500 | **Business Mathematics**<br>Students develop the skills necessary to solve mathematical problems, analyze and interpret data, and apply sound decision-making | ~~BUS, MTH~~ | Mathematics |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | skills in business. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | | |
| 030600 | **Business Communications**<br>Students master the oral and written communication skills essential to interacting effectively with people in the workplace and society. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS, ENG~~ | English |
| 030900 | **Business Law**<br>Addresses statutes and regulations affecting businesses, families and individuals in their related roles. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS~~ | — |
| 031500 | **Personal Finance**<br>Students develop and utilize rational decision-making processes to form personal financial decisions in their roles as citizens, workers, and consumers. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS~~ | — |
| 031700 | **Computer Programming and Software Development**<br>Students design, develop, test and implement computer programs using structural/procedural, objective oriented, data description, scripting/control, and/or mark-up languages. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS, TEC~~ | — |
| 031800 | **Business Economics**<br>Develops student's abilities to make wise economic decisions related to their personal financial affairs, the successful operation of organizations, and the economic activities of the country. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS, SOC~~ | Economics |
| 032300 | **Introduction to Business/General Business**<br>The study of domestic and international business operations including start-up, financing, management, and standard practices. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from | ~~BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | the 9-12 grade band of NBEA Standards are eligible for high school credit. | | |
| 032800 | **Office Procedures**<br>Instruction in office practices and procedures, office technology, office environment, records management, human relations, and telephone techniques. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS~~ | — |
| 033450 | **Business (Other)**<br>Abbreviated written and/or electronic communications. | ~~BUS~~ | — |
| 036000 | **Computer Application**<br>Students identify, evaluate, select, install, use, upgrade, and customize application software. Computer applications include word processing, database, spreadsheet, presentation, and calendaring/scheduling software. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS, TEC~~ | — |
| 036000 | **Computer Application**<br>Students identify, evaluate, select, install, use, upgrade, and customize application software. Computer applications include word processing, database, spreadsheet, presentation, and calendaring/scheduling software. Content should be based on National Business Education Association (NBEA) content standards. Only grade 9-12 courses based on standards from the 9-12 grade band of NBEA Standards are eligible for high school credit. | ~~BUS, TEC~~ | — |

## *English Language Arts Section*

**Table 6. English Language Arts Codes (05xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 050102 | **Reading K-3**<br>This course should address the content in the K-3 portion of Ohio's Learning Standards for Reading. Reading instruction should include the reading of a variety of text (e.g., informational and literary), application of comprehension strategies, and the building and extending of vocabulary. | ~~N/A~~ | Reading |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 050103 | **Reading 3-4**<br>This course should address the content in the 3-4 portion of Ohio's Learning Standards for Reading. Reading instruction should include the reading of a variety of text (e.g., informational and literary), application of comprehension strategies, and the building and extending of vocabulary. This course should contain a majority of 4th graders, but will also include 3rd graders who have been retained due to Third Grade Reading Guarantee. | ~~N/A~~ | Reading |
| 050104 | **Reading 4-6**<br>This course should address the content in the 4-6 portion of Ohio's Learning Standards for Reading. Reading instruction should include the reading of a variety of text (e.g., informational and literary), application of the comprehension strategies, and the building and extending of vocabulary. | ~~N/A~~ | Reading |
| 050106 | **Reading 7-8**<br>This course should address the content in the 7-8 portion of Ohio's Learning Standards for Reading. Reading instruction should include the reading of a variety of text (e.g., informational and literary), application of the comprehension strategies, and the building and extending of vocabulary. | ~~N/A~~ | Reading |
| 050152 | **Integrated English Language Arts K-3**<br>Instruction should be based on the standards for grades K-3. Students should read grade appropriate text and use a variety of comprehension strategies for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned tasks and use effective communication techniques. | ~~N/A~~ | Language Arts |
| 050153 | **Integrated English Language Arts 3-4**<br>Instruction should be based on the standards for grades 3-4. Students should read grade appropriate text and use a variety of comprehension strategies for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned tasks and use effective communication techniques. This course should contain a majority of 4th graders, but will also include 3rd graders who have been retained due to Third Grade Reading Guarantee. | ~~N/A~~ | Language Arts |
| 050154 | **Integrated English Language Arts 4-6**<br>Instruction should be based on the standards for grades 4-6. Students should read grade appropriate text and use a variety of comprehension strategies for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned tasks, and use effective communication techniques. | ~~N/A~~ | Language Arts |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 050156 | **Integrated English Language Arts 7-8**<br>Instruction should be based on the standards for grades 7-8. Students should read grade appropriate text and use a variety of comprehension strategies for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned tasks and use effective communication techniques. | ~~N/A~~ | Language Arts |
| 050160 | **Integrated English Language Arts I**<br>Integrated Language Arts Instruction addresses the content and skills in Ohio's Learning Standards for English Language Arts. Instruction should be based on the standards for grade 9. Students will read a variety of texts for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned topics, use an appropriate form to communicate their findings, and continue to use effective communication techniques. | ~~ENG~~ | Language Arts |
| 050170 | **Integrated English Language Arts II**<br>Integrated Language Arts Instruction addresses the content and skills in Ohio's Learning Standards for English Language Arts. Instruction should be based on the standards grade 10. Students will read a variety of texts for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned topics, use an appropriate form to communicate their findings, and continue to use effective communication techniques. | ~~ENG~~ | Language Arts |
| 050180 | **Integrated English Language Arts III**<br>Integrated Language Arts Instruction addresses the content and skills in Ohio's Learning Standards for English Language Arts. Instruction should be based on the standards for grade 11. Students will read a variety of texts for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned topics, use an appropriate form to communicate their findings, and continue to use effective communication techniques. | ~~ENG~~ | Language Arts |
| 050190 | **Integrated English Language Arts IV**<br>Integrated Language Arts Instruction addresses the content and skills in Ohio's Learning Standards for English Language Arts. Instruction should be based on the standards for grade 12. Students will read a variety of texts for different purposes, utilize the writing process, write for different purposes and different audiences, research self-selected or assigned topics, use an appropriate form to communicate their findings, and continue to use effective communication techniques. | ~~ENG~~ | Language Arts |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 050014 | **Intervention English**<br>This course is designed for remedial study with emphasis on Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 050119 | **Intervention Reading**<br>This course is designed to provide special assistance in the development of reading skills and strategies for students who cannot construct meaning from what they read. Instruction addresses content from the reading standards in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | Reading |
| 051905 | **English as a Second Language (ESL)**<br>This course is designed for individuals whose primary language is not English. The course will focus on the study of the English language and culture leading to the ability to function in everyday situations as well as in academic settings, with a special emphasis on Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 050220 | **Grammar and Usage**<br>This course emphasizes the editing phase of the writing process, providing students a variety of strategies for refining and editing their own writing. Instruction will be centered around the writing standards in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 050300 | **Literature**<br>This course is designed to provide instruction in the study of print materials, which have noteworthy content and excellence of style. Students apply the reading process to the various genres of literature. Instruction addresses content from the reading standards in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 050400 | **Composition**<br>This course will provide instruction in writing. Students will develop their writing with a focus on expository and persuasive techniques. Journals will be kept and portfolios will be maintained throughout the class. Instruction will be centered around the writing standards in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 050403 | **Journalism**<br>This course includes the study and practice of writing, editing, and publishing newspapers and periodicals. Instruction centers on the writing and research standards in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 050500 | **Speech**<br>This course covers subject matter and experiences in speech. A wide spectrum of studies and activities from the scientific (voice science) through the humanistic (rhetoric) will be taught. Behavioral sciences (group dynamics) as well as the artistic (oral interpretation of literature) will also be taught. | ~~ENG~~ | English |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 050545 | **Applied Communications**<br>This course gives students practice in communication skills of reading, writing, listening, and speaking in their chosen vocations. Students learn to deliver presentations that effectively convey information and persuade or entertain audiences. Instruction centers on the Communication: Oral and Visual Standard in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |
| 059920 | **English Language & Composition**<br>This course is centered around the reading and writing standards in Ohio's Learning Standards for English Language Arts. It is designed to develop the writing and language skills students need for success in their secondary school program, in their daily lives, and in a global society. Students will compose oral, written, and media text consisting of organized subject matter and experiences emphasized in English. | ~~ENG~~ | English |
| 059930 | **English Literature & Composition**<br>This course is centered around the reading and writing standards in Ohio's Learning Standards for English Language Arts. It is designed to develop the reading and writing skills students need for success in their secondary school program, in their daily lives, and in a global society. Students will analyze and interpret a variety of genres of literature as well as informational and graphic texts. | ~~ENG~~ | English |
| 059999 | **Other English/Language Arts Course**<br>This is designed as a topical course that can cover the different aspects of English Language Arts. Instruction will be centered around the standards in Ohio's Learning Standards for English Language Arts. | ~~ENG~~ | English |

## *Family & Consumer Sciences Section*

~~The courses below earn Home Economics Credit.~~

**Table 7. Family & Consumer Sciences (Non-Career Technical) Codes (23xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 230001 | **Family & Consumer Sciences**<br>Content from a combination of the various areas of family and consumer sciences. | ~~HEC~~ | — |
| 230100 | **Clothing and Textiles**<br>Nature, acquisition, and the use of clothing and textiles. | ~~HEC~~ | — |
| 230140 | **Foods and Nutrition**<br>Food and its role in personal and family living. | ~~HEC~~ | — |
| 230200 | **Child Development and Parenting**<br>The developing child and the care and guidance of children. | ~~HEC~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 230300 | **Consumer Education**<br>Consumer education as it relates to the management of homes and families. | ~~HEC~~ | — |
| 230500 | **Family Living**<br>Nurturing human development through the life span. | ~~HEC~~ | — |
| 230600 | **Housing and Home Furnishings**<br>Choosing, equipping and furnishing living environments. | ~~HEC~~ | — |

## *World Language Section*

**Table 8. World Language Codes (06xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 060101 | **Arabic**<br>The study of the language and culture of the Arabic-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060102 | **Chinese**<br>The study of the language and culture of the Chinese-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060103 | **Greek**<br>The study of the language, literature, and culture of the Ancient Greeks and their influence on modern civilization. | ~~FLR~~ | Foreign Language |
| 060104 | **Hebrew**<br>The study of the language and culture of the Hebrew-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060107 | **Latin**<br>The study of the language, literature, and culture of Ancient Rome and its influence on modern civilization. | ~~FLR~~ | Foreign Language |
| 060139 | **Hindi**<br>The study of the language and culture of the Hindi-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060218 | **Russian**<br>The study of the language and culture of the Russian-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 060221 | **Swahili**<br>The study of the language and culture of the Swahili-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060227 | **Czech**<br>The study of the language and culture of the Czech-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060230 | **French**<br>The study of the language and culture of the French-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060235 | **German**<br>The study of the language and culture of the German-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060245 | **Italian**<br>The study of the language and culture of the Italian-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060250 | **Japanese**<br>The study of the language and culture of the Japanese-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060255 | **Polish**<br>The study of the language and culture of the Polish-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060265 | **Spanish**<br>The study of the language and culture of the Spanish-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060275 | **Korean**<br>The study of the language and culture of the Korean-speaking world leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. | ~~FLR~~ | Foreign Language |
| 060900 | **World Language (Exploratory)**<br>A language survey course during which students are exposed to several languages. | ~~FLR~~ | Foreign Language |
| 060207 | **TESOL–English as a Second Language (ESL)**<br>The study of the language and culture of the English-speaking world leading to the ability to function in academic and everyday situa- | ~~FLR~~ | Foreign Language |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | tions. Designed for individuals whose primary language is not English. This course focuses on English as a foreign language. | | |
| 061050 | **American Sign Language (ASL)**<br>The study of the visual-gestural language used by Deaf communities in the United States and part of Canada. ASL has its own culture, grammar, and vocabulary; is produced by using the hands, face, and body; and is not derived from any spoken language. | ~~FLR~~ | Foreign Language |
| 069922 | **Latin: Vergil**<br>Students read, translate, analyze, and interpret the works of Vergil. | ~~FLR~~ | Foreign Language |
| 069915 | **French Literature**<br>A formal study of a representative body of literary texts in French for students who have advanced language skills. | ~~FLR~~ | Foreign Language |
| 069935 | **Spanish Literature**<br>A formal study of a representative body of literary texts in Spanish for students who have advanced language skills | ~~FLR~~ | Foreign Language |
| 069925 | **Latin Literature**<br>Students read, translate, analyze, and interpret Latin works. | ~~FLR~~ | Foreign Language |
| 069951 | **Early Language Learning Arabic**<br>The study of the language and culture of the Arabic-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069952 | **Early Language Learning Chinese**<br>The study of the language and culture of the Chinese-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069953 | **Early Language Learning Japanese**<br>The study of the language and culture of the Japanese-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069954 | **Early Language Learning Italian**<br>The study of the language and culture of the Italian-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069955 | **Early Language Learning German**<br>The study of the language and culture of the German-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 069956 | **Early Language Learning Hebrew**<br>The study of the language and culture of the Hebrew-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069957 | **Early Language Learning French**<br>The study of the language and culture of the French-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069958 | **Early Language Learning Spanish**<br>The study of the language and culture of the Spanish-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069959 | **Early Language Learning Swahili**<br>The study of the language and culture of the Swahili-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069960 | **Early Language Learning Russian**<br>The study of the language and culture of the Russian-speaking world in the elementary school leading to the ability to communicate in a limited range of situations and glean meaning from a growing variety of texts. | ~~N/A~~ | Foreign Language |
| 069961 | **Early Language Learning Latin**<br>The study in elementary school of the language, literature, and culture of Ancient Rome and its influence on modern civilization. | ~~N/A~~ | Foreign Language |
| 069962 | **Early Language Learning Greek**<br>The study in elementary school of the language, literature, and culture of Ancient Greece and its influence on modern civilization. | ~~N/A~~ | Foreign Language |
| 069963 | **Early Language Learning American Sign Language**<br>The study in elementary school of the visual-gestural language used by Deaf communities in the United States and part of Canada. ASL has its own culture, grammar, and vocabulary, grammar, and vocabulary; is produced by using the hands, face, and body; and is not derived from any spoken language. | ~~N/A~~ | Foreign Language |
| 069999 | **Other World Language**<br>The study of ~~the~~any foreign language and culture ~~of a foreign-speaking world~~not already represented by one of the codes above leading to the ability to communicate in a range of situations and glean meaning from a variety of texts. ~~This code should only be used for languages not represented by one of the codes above.~~ | ~~N/A~~ | Foreign Language |

## *Health and Physical Education Section*

**Table 9. Health Education Codes (26xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 260101 | **Health Education**<br>Educational activities that promote understanding, attitudes, and practices consistent with individual, family, and community health needs. | ~~HTH~~ | — |
| 260150 | **Substance Abuse Prevention**<br>Subject matter and learning experiences which address drug (including opioids), alcohol, and tobacco abuse situations including prevention, intervention, discipline, and community resources available to the pupil and to the family. | ~~HTH~~ | — |
| 260200 | **Safety/First Aid/CPR**<br>Subject matter and learning experiences concerned with developing students' awareness and understanding of hazards of everyday living, and the knowledge, habits, attitudes, and skills which will enable them to function at an optimum level in the prevention and care of injury situations. | ~~HTH~~ | — |
| 260410 | **Sports Medicine**<br>Educational activities concerned with the effects of sports and exercise on health and fitness and with the prevention and treatment of athletic injuries. | ~~HTH~~ | — |
| 269999 | **Other Health**<br>A course that is given for High School credits to be applied toward the diploma, but that is different in scope from any of the other SUBJECT CODES described above. | ~~HTH~~ | — |

**Table 10. Physical Education Codes (08xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 080300 | **Physical Education**<br>A comprehensive subject area which incorporates fundamental motor skills, body control and balance, physical fitness, leisure sports and games skills, cognitive skills, as well as stress management skills. | ~~PHE~~ | — |
| 080405 | **Lifetime Sports**<br>Activities taught throughout the school life with emphasis on learning experiences that can be turned into healthful lifetime skills. | ~~PHE~~ | — |
| 080505 | **Adapted Physical Education**<br>Adapted Physical Education is specially designed instruction in physical education. According to federal law, physical education means the | ~~PHE~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | development of (a) physical and motor fitness; (b) fundamental motor skills and patterns; and (c) skills in aquatics, dance, and individual and group games and sports. | | |
| 080900 | **Outdoor Physical Education**<br>A variety of outdoor leisure and sports activities, such as, fishing, archery, nature study, boating, backpacking, and similar pursuits that enhance students' physical health and their understanding of the natural world. | ~~PHE~~ | — |
| 080999 | **Other Physical Education Course**<br>Other Physical Education course for which high school credit can be earned that is different in scope and content from any of the other courses described above. | ~~PHE~~ | — |

## *Mathematics Section*

**Table 11. Elementary and Middle School Level Mathematics Codes (11xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| ~~The following four courses do not earn high school mathematics credit.~~ | | | |
| 110003 | **Mathematics K-3**<br>~~Instruction provided by a teacher to multiple groups of students rather than in a self-contained classroom setting.~~ Includes content in the K-3 portions of Ohio's Learning Standards for Mathematics. | ~~N/A~~ | Mathematics |
| 110150 | **Mathematics 4-6**<br>Includes content in the 4-6 portions of Ohio's Learning Standards for Mathematics. | ~~N/A~~ | Mathematics |
| 110175 | **Mathematics 7-8**<br>Includes content in the 7-8 portions of Ohio's Learning Standards for Mathematics. | ~~N/A~~ | Mathematics |
| 110060 | **Advanced Mathematics 7**<br>This is the first year of a two-year optional program designed to compress 7th, 8th, and 9th grades into two years. The content of this first year will address all of the 7th grade content and a portion of the 8th grade content. Description of the content appropriate for this course is identified in the Middle School Acceleration Guide based on Ohio's Learning Standards for Mathematics. | ~~N/A~~ | Mathematics |
| ~~The following course would receive high school mathematics credit if taught by a 7-12 or 4-9 licensed mathematics teacher.~~ | | | |
| 110065 | **Advanced Mathematics 8**<br>This is the second year of a two-year optional program designed to compress 7th, 8th, and 9th grades into two years. The content of this | ~~MTH~~ | Mathematics |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | second year will address the remaining content from the 8th grade content and the first year of high school (Mathematics I or Algebra I) as described in the Pathways for high school mathematics. Description of the content appropriate for this course is identified in the Middle School Acceleration Guide based on Ohio's Learning Standards for Mathematics. | | |

**Table 12. High School Level Mathematics Codes (11xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| **Topic-Focused Mathematics Course Sequence:** A four-year program or sequence of courses that addresses the content in the high school portion of Ohio's Learning Standards for Mathematics through topic-focused, discrete courses. Known as the Traditional Pathway, these courses would typically require the Traditional End-of-Course exams for Algebra and Geometry. | | | |
| 110301 | **Algebra 1**<br>The first course in a four-year sequence that addresses the high school portion of Ohio's Learning Standards for Mathematics. Description of the content appropriate for this course is identified in the Algebra Course document. | ~~MTH~~ | Mathematics |
| 111200 | **Geometry**<br>The second course in a four-year sequence that addresses the high school portion of Ohio's Learning Standards for Mathematics. Description of the content appropriate for this course is identified in the Geometry Course document. | ~~MTH~~ | Mathematics |
| 110302 | **Algebra 2**<br>The third course in a four-year sequence that addresses the high school portion of Ohio's Learning Standards for Mathematics. Description of the content appropriate for this course is identified in the Algebra 2/Mathematics 3 Course document. | ~~MTH~~ | Mathematics |
| 110099 | **Advanced Mathematics (Pre-Calculus)**<br>The fourth course in a four-year sequence which addresses advanced content in Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability, and/or the conceptual underpinnings of calculus. | ~~MTH~~ | Mathematics |
| **Integrated Mathematics Course Sequence:** A four-year program or sequence of courses that addresses the content in the high school portion of Ohio's Learning Standards for Mathematics using an integrated approach. Known as the Integrated Pathway, these courses would typically require the Integrated End-of-Course exams, Mathematics 1 and 2. | | | |
| 110010 | **Mathematics 1**<br>The first course in a four-year sequence that addresses the high school portion of Ohio's Learning Standards for Mathematics. Description of | ~~MTH~~ | Mathematics |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | the content appropriate for this course is identified in the Mathematics 1 Course document. | | |
| 110020 | **Mathematics 2**<br>The second course in a four-year sequence that addresses the high school portion of Ohio's Learning Standards for Mathematics. Description of the content appropriate for this course is identified in the Algebra 2/Mathematics 3 Course document. | ~~MTH~~ | Mathematics |
| 110030 | **Mathematics 3**<br>The third course in a four-year sequence that addresses the high school portion of Ohio's Learning Standards for Mathematics. Description of the content appropriate for this course is identified in the Algebra 2/Mathematics 3 Course document. | ~~MTH~~ | Mathematics |
| 110040 | **Mathematics 4 (Pre-calculus)**<br>The fourth course in a high school sequence that addresses advanced content in Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability, and/or the conceptual underpinnings of calculus. | ~~MTH~~ | Mathematics |
| **Applied Mathematics Course Sequence:** The following three courses address the content in the high school portion of Ohio's Learning Standards for Mathematics through concrete models and real-world situations and with less emphasis on symbol-manipulation and formal mathematical structure. This sequence of courses would typically require the respective Traditional or Integrated series of End-of-Course exams and would meet the requirement of Algebra II or its equivalent. If a course is used as a first year of a two year course, then the End-of-Course exam would follow the completion of the two years. A fourth course in high school mathematics is required to meet the Ohio Graduation Requirements. | | | |
| 110480 | **Applied Algebra or Applied Mathematics 1**<br>The first course in a high school sequence addressing content through concrete models and real-world situations and with less emphasis on symbol-manipulation and formal mathematical structure. This course may require the respective Algebra 1 or Mathematics 1 End-of-Course exam. | ~~MTH~~ | Mathematics |
| 110490 | **Applied Geometry or Applied Mathematics 2**<br>The second course in a high school sequence addressing content through concrete models and real-world situations and with less emphasis on symbol-manipulation and formal mathematical structure. This course may require the respective Geometry or Mathematics 2 End-of-Course exam. | ~~MTH~~ | Mathematics |
| 110500 | **Applied Algebra II or Applied Mathematics 3**<br>The third course in a high school sequence addressing content through concrete models and real-world situations and with less emphasis on symbol-manipulation and formal mathematical structure. | ~~MTH~~ | Mathematics |

**Table 13. Additional High School Level Mathematics Codes (11xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| **Mathematics Response to Intervention Course Sequence:** The following three courses are nonremedial and should coincide with instruction in specific mathematics courses along their respective Traditional or Integrated series to provide additional immediate support and intervention for students. Courses in this sequence address the content in the high school portion of Ohio's Learning Standards for Mathematics through concrete models and real-world situations and with less emphasis on symbol-manipulation and formal mathematical structure. | | | |
| 111960 | **Mathematics Response to Intervention Support 1**<br>This course is designed to provide additional support and to coincide with an Algebra 1 or Mathematics 1 course. This class is not remedial and is to provide immediate support and intervention for students. | ~~MTH~~ | Mathematics |
| 111970 | **Mathematics Response to Intervention Support 2**<br>This course is designed to provide additional support and to coincide with a Geometry or Mathematics 2 course. This class is not remedial and is to provide immediate support and intervention for students. | ~~MTH~~ | Mathematics |
| 111980 | **Mathematics Response to Intervention Support 3**<br>This course is designed to provide additional support and to coincide with an Algebra 2 or Mathematics 3 course. This class is not remedial and is to provide immediate support and intervention for students. | ~~MTH~~ | Mathematics |
| 110190 | **Transition to High School Mathematics**<br>~~(Elective high school credit optional in grades 9-12, not for high school credit below grade 9. This course does not meet the mathematics credit requirements of the Ohio Graduation Requirements.)~~<br>Course designed specifically as intervention for students who enter grade 9 not ready for high school level mathematics courses. Use this code for courses that contain little of the high school level content found in Ohio's Learning Standards for Mathematics. | ~~N/A~~ | Mathematics |
| 111350 | **Quantitative Reasoning**<br>This course prepares students to investigate contemporary issues mathematically and to apply the mathematics learned in earlier courses to answer questions that are relevant to their civic and personal lives. The applications should provide an opportunity for deeper understanding and extension of the material from earlier courses. This course should also show the connections between different mathematics topics and between the mathematics and the areas in which applied. | ~~MTH~~ | Mathematics |
| 111300 | **Discrete Mathematics**<br>The study of mathematical properties of sets and systems that have a countable number of elements including applications of systematic counting techniques and algorithmic thinking to represent, analyze, and solve problems. | ~~MTH~~ | Mathematics |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 111600 | **Trigonometry**<br>In-depth study of trigonometric and circular functions including modeling, graphing, and connecting to polar coordinates, complex numbers, and series. | ~~MTH~~ | Mathematics |
| 111850 | **Transition to College Mathematics**<br>A course designed for students in grades 11-12 making a transition to a college preparatory program. The content is from the high school portion of the New Learning Standards for Mathematics, both new and previously addressed topics with increasing emphasis on symbol manipulation and mathematical structure. | ~~MTH~~ | Mathematics |
| 111500 | **Probability and Statistics**<br>In-depth study of probability, data analysis, and statistics including applying the concept of random variables to generate and interpret probability distributions, transforming data to aid in interpretation and prediction, and testing hypotheses using appropriate statistics. | ~~MTH~~ | Mathematics |
| 119550 | **Statistics**<br>The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: Exploring Data, Sampling and Experimentation, Anticipating Patterns, and Statistical Inference. | ~~MTH~~ | Mathematics |
| 110600 | **Calculus**<br>A formal study of topics from calculus that is not associated with the Advanced Placement Program. Includes the study of limit, series, and differentiation and integration. | ~~MTH~~ | Mathematics |
| 119930 | **Calculus AB**<br>Calculus AB is designed to be taught over a full high school academic year. It is possible to spend some time on elementary functions and still teach the Calculus AB curriculum within a year. However, most of the year must be devoted to the topics in differential and integral calculus. The courses described here represent college-level mathematics for which most colleges grant advanced placement and/or credit. | ~~MTH~~ | Mathematics |
| 119960 | **Calculus BC**<br>Calculus BC is a full-year course in the calculus of functions of a single variable. It includes all topics taught in Calculus AB plus additional topics, but both courses are intended to be challenging and demanding; they require a similar depth of understanding of common topics. The courses described here represent college-level mathematics for which most colleges grant advanced placement and/or credit. | ~~MTH~~ | Mathematics |
| 119980 | **Data Science Foundations**<br>This course uses methods from statistics, mathematics, and computer science in order to find patterns and communicate meaning in | ~~MTH~~ | Mathematics |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | data. Data science focuses on using data to make predictions and decisions using large data sets. Description of the content appropriate for this course is identified in the Data Science Foundations course document. | | |
| 119999 | **Other Mathematics Course**<br>A course that is different in scope from any of the other SUBJECT CODES described above and addresses the high school portion of Ohio's Learning Standards for Mathematics or advanced content in Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability. High school credit can be earned and applied toward the Ohio Graduation Mathematics requirements. (A course that addresses concepts and skills below the 9-12 portion of Ohio's Learning Standards for Mathematics should be coded as 110190 Transition to High School Mathematics.) | ~~MTH~~ | Mathematics |

## *Science Section*

**Table 14. Science Codes (13xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 132110 | **Science (K-3)**<br>Early elementary science course for grades K-3. Course includes content found in Ohio's Learning Standards and Model Curriculum for Science, Grades K-3. Earth and Space Sciences, Life Sciences, and Physical Sciences are integrated with scientific practices, inquiry, and applications. | ~~N/A~~ | Science |
| 132120 | **Science (4-6)**<br>Elementary or early middle school science course for grades 4-6. Course includes content found in Ohio's Learning Standards and Model Curriculum for Science, Grades 4-6. Earth and Space Sciences, Life Sciences, and Physical Sciences are integrated with scientific practices, inquiry, and applications. | ~~N/A~~ | Science |
| 132130 | **Science (7-8)**<br>Middle school science course for grades 7-8. Course includes content found in Ohio's New Learning Standards and Model Curriculum for Science, Grades 7-8. Earth and Space Sciences, Life Sciences, and Physical Sciences are integrated with scientific practices, inquiry, and applications. | ~~N/A~~ | Science |
| 132900 | **Intervention Science**<br>High school science course for students who have previously completed Physical Science and Biology ~~and have taken but not yet passed~~ | ~~SCI~~ | Science |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | ~~the Ohio Graduation Test~~. ~~The variety of standards-based instruction and assessment strategies used in this course is appropriate to assist student preparation for the Ohio Graduation Test.~~ This course may not satisfy Ohio's graduation requirements. | | |
| 132220 | **Physical Science**<br>High school level course based on content found in Ohio's Learning Standards and Model Curriculum for Science, High School Physical Science. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 132230 | **Biology**<br>High school level course that includes content found in Ohio's Learning Standards and Model Curriculum for Science, High School Biology. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 132350 | **Environmental Science**<br>An advanced high school level course that includes content found in Ohio's Learning Standards and Model Curriculum for Science, High School Environmental Science. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 134250 | **Physical Geology**<br>An advanced high school level course that includes content found in Ohio's Learning Standards and Model Curriculum for Science, High School Physical Geology. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 130301 | **Chemistry**<br>An advanced high school level course that includes content found in Ohio's Learning Standards and Model Curriculum for Science, High School Chemistry. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information.~~ It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 130302 | **Physics**<br>An advanced high school level course that includes content found in Ohio's Learning Standards and Model Curriculum for Science, High School Physics. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information.~~ It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 131050 | **Human Anatomy and Physiology**<br>An advanced high school level course that includes content found in Ohio's Learning Standards and Model Curriculum for Science, Human Anatomy, and Physiology. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information.~~ It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 132330 | **Advanced Biology**<br>An advanced high school level course that may include concepts in anatomy, physiology, ecology, behavior, evolution, genetics, cell biology, microbiology, diversity, growth, or human biology. This course develops specialized content to extend connections, depth, and detail of biology that emphasizes content beyond what is outlined in Ohio's Learning Standards and Model Curriculum for Science, High School Biology. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information.~~ It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 132326 | **Advanced Chemistry**<br>An advanced high school level course that may include concepts in inorganic, organic, analytical, physical, or biological chemistry. This course develops specialized content to extend connections, depth, and detail of chemistry that emphasizes content beyond what is outlined in Ohio's Learning Standards and Model Curriculum for Science, High School Chemistry. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information.~~ It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 132340 | **Advanced Earth and Space Sciences**<br>An advanced high school level course that may include concepts in astronomy, oceanography, meteorology, geology, or natural resources. This course develops specialized content beyond what is outlined in Ohio's Learning Standards for Science to extend connections, depth, and detail of the major concepts and principles of earth and space sciences. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 132325 | **Advanced Physics**<br>An advanced high school level course that may include concepts in mechanics, electricity, magnetism, thermodynamics, waves, optics, atomic and nuclear physics, radioactivity, relativity, or quantum mechanics. This course develops specialized content beyond what is outlined in Ohio's Learning Standards for Science, High School Physics to extend connections, depth, and detail of physics. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 139960 | **Physics 1: Algebra-Based**<br>An algebra-based advanced high school level course that explores these topics: kinematics; dynamics; circular motion and gravitation; energy; momentum; simple harmonic motion; torque and rotational motion; electric charge and electric force; DC circuits; and mechanical waves and sound. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 139970 | **Physics 2: Algebra-Based**<br>An algebra-based advanced high school level course which explores fluids; thermodynamics; electrical force, field, and potential; electric circuits; magnetism and electromagnetic induction; geometric and physical optics; and quantum, atomic, and nuclear physics. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 139940 | **Physics C: Electricity & Magnetism**<br>An electricity and magnetism advanced high school level course that explores electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. This course includes inquiry-based laboratory experiences that engage students in | ~~SCI~~ | Science |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | | |
| 139950 | **Physics C: Mechanics**<br>A mechanics advanced high school level course that explores kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. This course includes inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. ~~It may satisfy Ohio's science graduation requirements.~~ | ~~SCI~~ | Science |
| 139997 | **Other Science**<br>Any introductory level high school science course that includes content typically taught at the 9th or 10th grade level and is not listed in previous ~~course~~ subject code descriptions. These courses would typically be science elective courses that are offered to grade 9 or 10 students, but may not satisfy Ohio's graduation requirements. | ~~SCI~~ | Science |
| 139998 | **Other Advanced Science**<br>Any advanced level science course that satisfies Ohio's Graduation Requirements for Science by including inquiry-based laboratory experiences that engage students in asking valid scientific questions and gathering and analyzing information. Course content must be at the 11th or 12th grade level or above, must not repeat content in K – 8, High School Physical Science, or Biology, and must be designed to prepare students for college or career level coursework or training. | ~~SCI~~ | Science |

## *Social Studies Section*

**Table 15. Social Studies Codes (15xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 151209 | **Social Studies (K-3)**<br>Elementary social studies course includes content and skills found in Ohio's Learning Standards and Model Curriculum for Social Studies, Grades K-3. Topics covered may include history, geography, government, and economics. | ~~N/A~~ | Social Studies |
| 151210 | **Social Studies (4-6)**<br>Elementary or early middle school social studies course that includes content and skills found in Ohio's Learning Standards and Model Curriculum for Social Studies, Grades 4-6. Topics covered may include history, geography, government, and economics. | ~~N/A~~ | Social Studies |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 151201 | **Social Studies (7-8)**<br>Elementary social studies course that includes content and skills found in Ohio's Learning Standards and Model Curriculum for Social Studies, Grades 7-8. Topics covered may include history, geography, government, and economics. | ~~N/A~~ | Social Studies |
| ~~The following courses may be offered for high school credit if taught by a properly credentialed 7-12 or 4-9 social studies teacher.~~ | | | |
| 150100 | **Anthropology**<br>The study of the physical, social and cultural development of humans. | ~~SOC~~ | Social Studies |
| 150600 | **Economics**<br>The study of how a society makes decisions about the production and consumption of goods and the transfer of wealth. | ~~SOC~~ | Social Studies |
| 153001 | **Financial Literacy**<br>The content of this course is based on the Financial Literacy Standards and Model Curriculum and includes topics such as financial responsibility and decision making, planning and money management, informed consumers, investing, credit and debt, risk management, and insurance. | ~~FIN~~ | — |
| 150700 | **Geography**<br>The study of the physical features of the earth and of human activity as it affects and is affected by these, including the distribution of populations and resources, land use, and industries. | ~~SOC~~ | Social Studies |
| 150300 | **Government (American)**<br>The study of institutions and processes through which decisions are made for the United States. Course may follow Ohio's Learning Standards and Model Curriculum for American government. Upon completion, students may take the American government end of course exam. | ~~SOC~~ | Social Studies |
| 150308 | **Government and Economics**<br>The study of institutions and processes through which decisions are made for the United States, and the study of how a society makes decisions about the production and consumption of goods and the transfer of wealth. Upon completion, students may take the American government end of course exam. ~~For this course to fulfill the financial literacy graduation requirement, financial literacy content must be taught along with economics.~~ | ~~SOC~~ | Social Studies |
| 150810 | **American History**<br>The study of American history from Reconstruction to the present. Course content may follow the Ohio's Learning Standards and Model Curriculum for American history. Upon completion of this course, students may take the American history end of course exam. | ~~SOC~~ | Social Studies |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 150815 | **African American History**<br>A course that examines American history from the perspective of African Americans. This course may include topics such as literature, music, art, geography and other topics to explore African American influences in American history and contemporary society. | ~~SOC~~ | Social Studies |
| 152300 | **Integrated History**<br>Course integrates content for both American and world history. Upon completion of the American history content of the course, students may take the American history end of course exam. | ~~SOC~~ | Social Studies |
| 150890 | **World History and Civilizations**<br>The study of multiple civilizations outside of the United States. This course is intended to provide a foundation for students to understand the major issues facing the world today. Must cover more than one region of the world to fulfill the Ohio Graduation requirement for World History and Civilizations. | ~~SOC~~ | Social Studies |
| 150400 | **Intervention Social Studies**<br>Remedial study in preparation for the end of course exams with little or no significant new content. | ~~SOC~~ | — |
| 151121 | **Psychology**<br>The study of the human mind and its influence on behavior. | ~~SOC~~ | Social Studies |
| 151300 | **Sociology**<br>The study of social relationships, institutions, and group behavior in societies. | ~~SOC~~ | Social Studies |
| 152810 | **European History**<br>The study of Europe's past. Topics of study may include the Medieval, Renaissance, and Reformation periods. | ~~SOC~~ | Social Studies |
| 159960 | **Government & Politics (Comparative)**<br>A course that focuses on fundamental concepts used by political scientists to study the processes and outcomes of politics in a variety of countries and settings. The course aims to illustrate the rich diversity of political life, to show available institutional alternatives, to explain differences in processes and policy outcomes, and to communicate the importance of global political and economic changes. | ~~SOC~~ | Social Studies |
| 159950 | **Government & Politics (United States)**<br>A course that studies general concepts used to interpret U.S. government and politics such as: constitutional underpinnings of U.S. government, political beliefs and behaviors, political parties, interest groups, mass media, institutions of national government, and civil rights and civil liberties. | ~~SOC~~ | Social Studies |
| 159930 | **Macroeconomics**<br>The study of the functioning of entire economies. | ~~SOC~~ | Social Studies |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 159940 | **Microeconomics**<br>The study of the behavior of individual households, firms and markets. | ~~SOC~~ | Social Studies |
| 152150 | **Issues in Social Studies**<br>A course that examines issues or topics in social studies. | ~~SOC~~ | — |
| 159999 | **Other Social Studies**<br>The study of specialized social studies topics (including community service courses per ORC 3313.605). | ~~SOC~~ | — |

## *Technology Section*

**Table 16. Computer Science Codes (29xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| The following are computer science courses in accordance with Ohio Revised Code §3319.236. | | | |
| 290245 | **Computer Science K-8**<br>Includes content in the appropriate grade range portion of Ohio's Learning Standards for Computer Science. | ~~N/A~~ | — |
| 290250 | **Computer Science**<br>In this course, students develop an understanding of how computing is used to solve problems and enable innovation across fields and how these solutions can impact society. Students explore using computational thinking skills and tools to solve problems and create artifacts. Effective communication and collaboration skills are developed as students work individually and in group explorations. | ~~TEC~~ | — |
| 290310 | **Computer Science with In-Depth Study**<br>This course addresses computer science topics that include problem solving strategies, organization of data, algorithmic thinking and programming, analysis of potential solutions and the impacts of computing. The course provides the opportunity for a more in-depth study of selected computer science content. | ~~TEC~~ | — |
| 290325 | **Specific Topics in Computer Science**<br>This course provides a focused examination of specific computer science topics. | ~~TEC~~ | — |
| 290170 | **Networking**<br>In this course, students understand the concepts and use of network servers and devices (e.g., host, firewall, router, switch). Students understand the advantages and disadvantages of network models (e.g., peer-peer, client-server). Content addresses network design fundamentals including network type (e.g., LAN, WAN, MAN). Students also learn the application of network topologies (e.g., Star, bus, hybrid). At | ~~TEC~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | an *advanced* level, students design and build simple networks, understand server virtualization and network security. | | |
| 290180 | **Computer Service**<br>This course includes configuration, troubleshooting and repair of network hardware, clients and peripherals. In addition, content should include installation of operating systems including updates, computer security and customer service. | ~~TEC~~ | — |
| 299999 | **Other Computer Science**<br>A high school level course that addresses content from the 9-12 section of Ohio's Learning Standards for Computer Science and is different in scope from any of the other Subject Codes described above. | ~~TEC~~ | — |

**Table 17. Information Literacy Codes (20xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 200910 | **Information Literacy K-3**<br>Instruction that includes content in the K-3 portion of Ohio's Learning Standards for Technology and library guidelines. | ~~N/A~~ | — |
| 200915 | **Information Literacy 4-6**<br>Instruction that includes content in the 4-6 portion of Ohio's Learning Standards for Technology and library guidelines. | ~~N/A~~ | — |
| 200920 | **Information Literacy 7-8**<br>Instruction that includes content in the 7-8 portion of Ohio's Learning Standards for Technology and library guidelines including internet searching, evaluation of websites and other electronic resources. | ~~N/A~~ | — |
| 200700 | **Library Science**<br>Course focuses on how information is organized, accessed, and evaluated, including use of information management systems in school, public, academic, and government libraries. | ~~TEC~~ | — |
| 200905 | **Information Literacy**<br>Instruction focuses on recognizing the need for information and developing the skills to locate, evaluate and utilize the information. Learning experiences include information retrieval and critical thinking skills that enable students to acquire, interpret, evaluate, create, and communicate information. Information sources include print, nonprint, electronic, Internet-based resources accessed via the school library, school district, Internet, statewide/national networks, and other providers. | ~~TEC~~ | — |

**Table 18. Technology Education Codes (10xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| The following courses address computer science (29xxxx) as well as Information and Communication Technology (29xxxx) or Technology Education (10xxxx). | | | |
| 101355 | **Robotics K-8**<br>Students engage in a design process to manage and control devices through investigative and exploration activities. Products of student work in robotics may be descriptive and/or functional models of technology applications. Students will apply the knowledge and skills necessary to program and operate robots. The students will learn robotic operations and system configurations. Students will code and debug programs using the robotic programming language. This course can also serve as a computer science course. | ~~N/A~~ | — |
| 290200 | **Computer Programming**<br>This course includes the study and use of programming languages (e.g., C++, C#, Java, Python). | ~~TEC~~ | — |
| 290160 | **Website Development**<br>This course includes planning, designing and coding webpages to create dynamic, usable websites. Content includes web programming using common design tools, e.g., HTML, XML, CSS, web-based editors. Students study and use web-based protocols, e.g., SFTP, TCP/IP, HTTP, HTTPS. In addition, content includes using tag elements, working with graphics, hypertext links, graphical tables and accessibility methods including Universal Design. | ~~TEC~~ | — |
| 101350 | **Robotics**<br>Application of processes and knowledge in the design, development, and use of systems to manage and control devices. Products of student work in robotics may be descriptive and/or functional models of technology applications across all systems areas. | ~~TEC~~ | — |
| 102500 | **Industrial Computer Applications**<br>Experiences with computer applications across the technological systems areas. Selected activities covering computer hardware, software, and interface device applications to develop understanding of industrial uses of computers. | ~~TEC~~ | — |
| 290210 | **Artificial Intelligence**<br>In this course, students will learn the concepts, tools, and building blocks of artificial intelligence (AI). Specifically, the course should address AI components including perception, representation and reasoning, machine learning, natural interaction, and societal impacts. Students will learn about the use and inherent risks associated with AI. | ~~TEC~~ | — |
| 290220 | **Cybersecurity Education**<br>Students will be introduced to the components of cybersecurity and | ~~TEC~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | the role each plays in computing. The course will address security protocols and tactics for infrastructure, network, and system security, which lead to the prevention, detection, and mitigation of common vulnerabilities and attacks. Throughout this course, students will examine, test, and implement security safeguards. | | |
| The following courses address Information and Communication Technology (29xxxx) or Technology Education (10xxxx). | | | |
| 102285 | **Technological Literacy K-3**<br>Instruction that includes content in the K-3 portion of Ohio's Learning Standards for Technology. Instruction focuses on skills and knowledge that set the foundation for using a design process to solve problems to meet human/societal needs. Students examine how technology and their world are connected and their own role in technology's impact on self and others. | ~~N/A~~ | — |
| 102290 | **Technological Literacy 4-6**<br>Instruction that includes content in the 4-6 portion of Ohio's Learning Standards for Technology. Instruction focuses on skills and knowledge involved in using a design process to solve problems to meet human/societal needs. Students examine the relationship between technology and society and their own role in technology's impact on self and others. | ~~N/A~~ | — |
| 102295 | **Technological Literacy 7-8**<br>Instruction that includes content in the 7-8 portion of Ohio's Learning Standards for Technology. Instruction focuses on skills and knowledge involved in using a design process to solve problems to meet human/societal needs. Students examine the relationship between technology and society and their own role in technology's impact on self and others. | ~~N/A~~ | — |
| 290035 | **Computer/Multimedia Literacy K-3**<br>Instruction that includes content in the K-3 portion of Ohio's Learning Standards for Technology focusing on the use of educational technology for learning. Students develop basic, foundational skills and knowledge for using digital learning tools to access, create, evaluate, apply and communicate ideas and information. | ~~N/A~~ | — |
| 290040 | **Computer/Multimedia Literacy 4-6**<br>Instruction that includes content in the 4-6 portion of Ohio's Learning Standards for Technology, focusing on the use of educational technology for learning. Students develop skills and knowledge for using digital learning tools to access, create, evaluate, apply and communicate ideas and information. | ~~N/A~~ | — |
| 290045 | **Computer/Multimedia Literacy 7-8**<br>Instruction that includes content in the 7-8 portion of Ohio's Learning | ~~N/A~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | Standards for Technology, focusing on the use of educational technology for learning. Students develop skills and knowledge for using digital learning tools to access, create, evaluate, apply and communicate ideas and information. | | |
| 290050 | **Computer/Multimedia Literacy**<br>This course focuses on concepts in the 9-12 portion of Ohio's Learning Standards for Technology. Instruction is most effective when integrated or linked to other content areas. | ~~TEC~~ | — |
| 290100 | **Technology-Productivity Tools**<br>This course focuses on concepts in 9-12 portion of Ohio's Learning Standards for Technology that increase personal productivity and manage information. Instruction is most effective when integrated or linked to other academic areas. | ~~TEC~~ | — |
| 290110 | **Technology-Communication Tools**<br>This course focuses on concepts in the 9-12 portion of Ohio's Learning Standards for Technology including identifying purpose, audience and communication strategy. Instruction is most effective when integrated or linked to other academic content areas. | ~~TEC~~ | — |
| 290120 | **Technology-Problem-Solving Tools**<br>This course focuses on concepts in the 9-12 portion of Ohio's Learning Standards for Technology including inquiry/problem-solving skills and technology tools. Instruction is most effective when integrated or linked to other academic content areas. | ~~TEC~~ | — |
| 290130 | **Internet Searching**<br>This course focuses on concepts in the 9-12 portion of Ohio's Learning Standards for Technology including internet search strategies, search engine ranking methods and website evaluation. | ~~TEC~~ | — |
| 290075 | **Technology: Electronic Resources**<br>This course focuses on concepts in the 9-12 portion of Ohio's Learning Standards for Technology including information literacy concepts and use of technology tools to conduct research. Topics include use of internet and other electronic information resources. | ~~TEC~~ | — |
| 290140 | **Technology and Ethics**<br>This course focuses on concepts in the 9-12 portion of Ohio's Learning Standards for Technology and library guidelines including copyright, intellectual property, biotech and other current ethical concerns. | ~~TEC~~ | — |
| 290150 | **Computer Graphics**<br>This course includes design techniques used to generate computer graphics. Topics may include use of tools to draw, import, edit, create, animate images, photos, original artwork, etc. | ~~TEC~~ | — |
| 102300 | **Technology Education**<br>Comprehensive action-based courses concerned with the evolution, utilization, and significance of technology and its impact on industry, | ~~TEC~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | including its organization, personnel, systems, techniques, resources, products, and socio cultural aspects. | | |
| 107450 | **Foundations of Technology**<br>Prepares students to understand and apply technological concepts and processes that are the cornerstone for the high school technology program. Group and individual activities engage students in creating ideas, developing innovations and engineering practical solutions. Students apply content knowledge from science, mathematics and other areas as they engage with technology content, resources and laboratory/classroom activities. This course will focus on the three dimensions of technological literacy: knowledge, ways of thinking and acting, and capabilities, with the goal of students developing the characteristics of technologically literate citizens. | ~~TEC~~ | — |
| 101700 | **Research and Development**<br>The study of industrial-technical problems, including provisions for individual or group investigations of problems and opportunities to evaluate their solutions by designing, constructing, and testing products. | ~~TEC~~ | — |
| 101720 | **Design**<br>This course includes design topics from the 9-12 portion of Ohio's Learning Standards for Technology; including identifying and producing a product or system using a design process, evaluating the final solution, and communicating findings; recognizing the role of teamwork in engineering design and of prototyping in a design process; and understanding and applying research, development, and experimentation to problem-solving. | ~~TEC~~ | — |
| 101730 | **Issues and Problems in Technology**<br>The study of themes concerning technology, society, and the environment. | ~~TEC~~ | — |
| 100099 | **Other Technology**<br>A high school level course that addresses content from the 9-12 section of Ohio's Learning Standards for Technology and is different in scope from any of the other Subject Codes described above. | ~~TEC~~ | — |
| The following includes technology education courses (10xxxx) that focus on technology systems for the construction, manufacturing, communication, energy/power/transportation, and bio-related/chemical fields. | | | |
| 100100 | **Construction**<br>The study of the technology and the socioeconomic contributions of those industries concerned with residential, civic industrial, civil, and transportation structures. | ~~TEC~~ | — |
| 100800 | **Home Mechanics**<br>The study of the tools, materials, and processes involved in the upkeep and repair of the home, its equipment and devices. | ~~TEC~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 101300 | **Manufacturing**<br>The study of the technology and the socioeconomic contributions of industries concerned with the creation of durable consumer products. | ~~TEC~~ | — |
| 101800 | **Service Industries**<br>The study of the technology of industries concerned with the maintenance and repair of consumer and/or industrial products. | ~~TEC~~ | — |
| 101900 | **Woods Processes**<br>Information and skills concerned with woods, including various manufactured wood products, focusing on the technology employed in the manufacture and construction of products using woods and related factors such as occupations, economics, and consumer information. | ~~TEC~~ | — |
| 101410 | **Metals Processes**<br>Information and skills concerned with metals including the products manufactured from metals and the technology employed in the production, processing, and use of metals, as well as related factors such as occupations, economics, and consumer information. | ~~TEC~~ | — |
| 101500 | **Plastics**<br>Information and skills concerned with the production, processing, and use of plastics, composites and related factors such as occupations, economics, and consumer information. | ~~TEC~~ | — |
| 100200 | **Industrial Crafts**<br>Information and skills concerned with handcrafts and the craft industry, including its tools, materials, processes, products, and occupations. | ~~TEC~~ | — |
| 100300 | **Drafting**<br>Information and skills concerned with conveying ideas or illustrations graphically through drawings, charts, sketches, maps, and graphs, and the related factors such as the role of drafting in history and industry. | ~~TEC~~ | — |
| 100401 | **Electricity/Electronics**<br>Information and skills concerned with electrical energy including theory, applications, and control as it relates to electrically powered equipment, to various kinds of communications equipment, and to related factors such as occupations, economics, and consumer information. | ~~TEC~~ | — |
| 100700 | **Graphic Arts**<br>The study of information and skills concerned with graphic reproduction, as well as related factors such as occupations, economics, and consumer information. | ~~TEC~~ | — |
| 102000 | **Communications**<br>Provides an introduction to technical communication systems and processes. Students use a variety of technologies and media to create, implement, and evaluate a network to solve a communication problem. | ~~TEC~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 101610 | **Power Mechanics**<br>Information and skills concerned with the various forms of power, including its generation, transmission, and utilization. | ~~TEC~~ | — |
| 102100 | **Energy/Power/Transmission**<br>Beginning-level course designed to provide a conceptualized study of basic machines. Students obtain a basic understanding and develop skills needed to identify, build, maintain, test, and develop machines. | ~~TEC~~ | — |
| 103050 | **Bio-Related and Chemical Technology Systems**<br>Comprehensive study of the knowledge and process in designing, making, developing, producing, using, managing, and assessing of technological systems to produce products with bio-related and chemical applications. | ~~TEC~~ | — |

# CAREER-TECHNICAL EDUCATION SECTION

## *Workforce Development Section*

**Table 19. Career Field 01: Agricultural & Environmental Systems Codes (01xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 010105 | **Agriculture, Food and Natural Resources**<br>This first course in the career field is an introduction to Agricultural and Environmental Systems. Students will be introduced to the scope of the Agricultural and Environmental Systems career field. They will examine principles of food science, natural resource management, animal science & management, plant & horticultural science, power technology and bioscience. Students will examine the FFA organization and Supervised Agricultural Experience programs. Throughout the course, students will develop communication, leadership and business skills essential to the agriculture industry. | ~~CTA~~ | — |
| 010115 | **Business Management for Agricultural and Environmental Systems**<br>Students will examine elements of business, identify organizational structures and apply management skills while developing business plans, financial reports and strategic goals for new ventures or existing businesses. Learners will use marketing concepts to evaluate the marketing environment and develop a marketing plan with marketing channels, product approaches, promotion and pricing strategies. Throughout the course, students will apply concepts of ethics and professionalism while implications of business regulations will be identified. | ~~CTA~~ | — |
| 010120 | **Mechanical Principles**<br>Students will engage in the mechanical principles utilized in animal and plant production systems. They will learn electrical theory, design, wiring, hydraulic and pneumatic theory, along with metallurgy in relation to hot and cold metals. Students will apply knowledge of sheet metal fabrication applicable to the agricultural industry along with identify, diagnose, and maintain small air-cooled engines. Throughout the course, students will learn critical components of site and personal safety as well as communication and leadership skills. | ~~CTA~~ | — |
| 010155 | **Plant and Horticultural Science**<br>This first course in the pathway focuses on the broad knowledge and skills required to research, develop, produce and market agricultural, horticultural, and native plants and plant products. Students will apply principles and practices of plant physiology and anatomy, plant protection and health, reproductive biology in plants, influences in bioengineering, plant nutrition and disorders. Environmental aspects of irrigation, chemical application, soils, and pest management will be | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | studied and applied. Projects and activities will enable students to develop communication, leadership, and business management skills. | | |
| 010190 | **Agricultural and Environmental Systems Capstone**<br>Students apply Agricultural and Environmental Systems program knowledge and skills in a more comprehensive and authentic way. Capstones are project/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through partnerships, students combine classroom learning with work experience to benefit themselves and others. These can take the form of mentorship employment, cooperative education, and internships. | ~~CTA~~ | — |
| 010210 | **Agricultural and Industrial Power**<br>The Agricultural and Industrial Power course will introduce students to the breadth of the Agricultural and Industrial Power Technology pathway. Students will learn the principles of agricultural and industrial power technology equipment systems including electronic, electrical, engines, fuel, hydraulics, and power trains. Additionally, students will learn to operate and maintain agricultural and industrial equipment. | ~~CTA~~ | — |
| 010215 | **Electronic and Electrical Systems**<br>In the Electronic and Electrical Systems course, students will diagnose problems, test and repair electronic and electrical components. Students will learn physical principles of electricity and apply such to the proper maintenance, diagnosis and repair of electrical circuits. Students will learn the physical and mathematical principles of electronics, controllers and sensors and will learn the operation of onboard computers and programmable controllers. | ~~CTA~~ | — |
| 010220 | **Engines and Fuel Systems**<br>In the Engines and Fuel Systems course, students will learn basic engine information and operations; different kinds of corollary systems; how to use test equipment and service tools; plus techniques for diagnosis and testing. Students will learn the different kinds of fuel systems, fuels and their characteristics, designations, and additives. Students will diagnose fuel system problems including the identification of parts failure and will be able to make necessary repairs. | ~~CTA~~ | — |
| 010225 | **Hydraulics and Pneumatics**<br>In the Hydraulics and Pneumatics course, students will learn physical principles of hydraulics. They will diagnose problems, test system components, learn how to properly maintain hydraulic circuits and diagnose and test problem areas in hydraulics systems of agricultural and industrial power equipment. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 010230 | **Power Trains**<br>In the Power Trains course, students will learn the physical principles of power trains, the different components that transfer and control power, and how power trains are designed to function. Students will also learn how to adjust and maintain a power train system as well as how to diagnose and test problem areas. | ~~CTA~~ | — |
| 010235 | **Outdoor Power Technology**<br>The Outdoor Power Technology course trains students in technical knowledge and skills necessary to maintain, troubleshoot and repair small power equipment used in agriculture, horticulture and natural resource management. Students will learn the theory of power and progress through aspects of 2- and 4-stroke engines, electrical systems, fuel systems, and drive train systems that make up modern small engine powered equipment. | ~~CTA~~ | — |
| 010240 | **Power Sports**<br>In the Power Sports course, students will learn the theories of operating systems and the maintenance practices for power sport vehicles used off road or on the water. Students will learn principles of power sports vehicles including diagnosis, service, and repair. This course covers core information on power sport internal combustion engines, primary drive operation, transmission power flow, fuel system operation, and electrical and suspension systems. | ~~CTA~~ | — |
| 010610 | **Greenhouse and Nursery Management**<br>The course will apply principles of science, engineering, and business to support the sustainable propagation and production of plants in a commercial nursery or greenhouse facility. Management of soil/media, water and nutrient distribution, lighting, ventilation and temperature, and pests will be learned and applied. Students will demonstrate knowledge of propagation methods, plant health, nutrition, and growth stimulation. Students will develop successful business, communication, marketing, and sales strategies for use in the greenhouse and nursery industries. | ~~CTA~~ | — |
| 010615 | **Landscape Systems Management**<br>Students will learn methods for establishing and managing landscapes to promote growth and balance. The classification and care of woody and herbaceous landscape plants will be covered in-depth. Students will learn to optimize growing conditions, balance nutrients, and manage pests and disease. Horticultural skills including proper planting, fertilizing, and pruning techniques will be practiced while safely operating well maintained specialized equipment. The implications of landscape installation on the environment will be analyzed and eco-friendly practices applied. Students will employ communication, business, and management strategies appropriate for the industry. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 010620 | **Agronomic Systems**<br>Students will apply knowledge and skills required to research, develop, produce and market major agricultural and horticultural crops. Cultural and sustainable production practices will be examined while students apply scientific knowledge of plant development, nutrition and growth regulation. The knowledge and skills needed to manage water, soils, and pests related to agronomic crops will be assessed. Students will employ technological advances, communication, business, and management strategies appropriate for the industry. | ~~CTA~~ | — |
| 010625 | **Floral Design and Marketing**<br>Students will use principles and elements of design to create various types and styles of floral arrangements with natural and artificial plants and plant products. Topics will include identification of ornamental plants and cut flowers, use of design materials, and storage and handling applications. Students will develop successful business, communication, marketing, and sales strategies for use in the floral industry. | ~~CTA~~ | — |
| 010630 | **Landscape Design**<br>Students will learn skills in creating blueprints, estimates and landscaping designs. Topics include basic principles of design, engineering, drawing and drafting techniques including the use of technology such as computer-aided design. Students will incorporate principles of hardscapes and examine the use of artificial lighting, water systems, and creative features in their designs. Throughout the course, business management practices, employability skills, and safety procedures will also be emphasized. | ~~CTA~~ | — |
| 010635 | **Turf Science and Management**<br>Students will apply principles of science, engineering, and business to support the establishment and maintenance of residential, athletic and recreational turf. Students will learn techniques for the establishment, care, production, and marketing of turf grass along with safe operation and maintenance of specialized equipment. Throughout the course, environmental awareness and conservation practices will be emphasized along with communication, business, and management strategies appropriate for the industry. | ~~CTA~~ | — |
| 010710 | **Natural Resources**<br>Students will apply science principles and management practices to the protection of renewable and non-renewable natural resources. Students will learn fundamentals of land use as well as watershed, wildlife, fishery and forest management. Furthermore, students will learn management practices related to managing air and water quality along with requirements for managing solid and liquid waste. Throughout the course, students will apply communications, business | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | principles and leadership skills. | | |
| 010715 | **Energy Systems Management**<br>Students will apply basic principles of energy accounting, thermodynamics and heat transfer, energy conversion and efficiency to heating, power generation and transportation. Students will apply the principles and practices needed for managing both renewable and non-renewable energy sources including, solar thermal, hydrogen generation, photovoltaic, hydroelectric, biomass use, geothermal heat transfer, and fossil fuel. Future energy systems and energy use scenarios are investigated, with a focus on promoting the use of renewable energy resources and technologies. | ~~CTA~~ | — |
| 010716 | **Bio Energy**<br>Students are introduced to the scientific and technical processes of biofuel/bioenergy production. Learners will evaluate the energy conversion process and methods for optimizing the fermentation process. Students will identify the systems and components employed by fermentation systems and communicate safe handling techniques of equipment, biomass, effluent and biogas. A focus will be given to environmental impacts, life-cycle analysis, and economic analysis of bioenergy production. | ~~CTA~~ | — |
| 010717 | **Solar and Wind Energy**<br>Students will specify system options by conducting Energy Site Assessments by using and interpreting resource maps, performance data, zoning requirements and interferences, installation timelines and price. Students will read plans, lay out components and assemble electrical systems. Students will perform system checkouts and interpret results from mechanical and electrical diagnostic reports and compile and maintain system records. Students will apply safety regulations and requirements and identify and mitigate public safety issues during system installations. | ~~CTA~~ | — |
| 010718 | **Oil and Gas Operations**<br>Students will develop the skills applicable to careers in petroleum, natural gas and coal industries. They will learn practices related to exploration, leasing, surveying, drilling, geophysical logging and completion process. Students will be familiar with wellhead and surface production equipment and interpret production histories and graphs. Students will learn sampling, analysis, monitoring and control techniques for effective environmental management in the extractive industries and the principals of metering, sales and marketing. | ~~CTA~~ | — |
| 010720 | **Environmental Science for Agriculture and Natural Resources**<br>Learners will study relationships between organisms and their environment. Principles of biogeochemical cycles, air-water-land relationships, non-point pollution, and wetlands will be applied. Learners will | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | examine economic fundamentals of resource development, agriculture sustainability, energy needs and pollution control. Learners will analyze and interpret data gathered from ecosystems, population studies, forest management practices, pesticide use, land use and waste management. Learners will develop responses to environmental problems and develop management strategies for responsible conservation and resource development. | | |
| 010725 | **Environmental Systems Management**<br>Learners will analyze and interpret biological, chemical and physical properties of soil, water and air. They will determine the source and type of environmental contamination, evaluate pollution control measures and be prepared to respond accordingly. Learners will be able to monitor treatment processes for potable water, waste water and solid waste. Learners will develop and implement environmental plans using principles governing ecosystems in relation to resource development and industrial processes. | ~~CTA~~ | — |
| 010730 | **Forestry and Woodland Ecosystems**<br>Learners will apply principles of botany, dendrology and silviculture to the management of forests and forest ecosystems. Learners will apply principles of timber cruising with surveying and mapping techniques to take forest measurements. Learners will develop the knowledge and skills necessary for forest reforestation, timber stand improvement, timber harvesting and forest product utilization. Learners will operate and maintain forestry equipment, apply fire management practices, and understand related regulations, laws, and policy issues. | ~~CTA~~ | — |
| 010735 | **Park and Recreational Management**<br>Students will design facilities, develop educational programs and manage resources for use in public recreation. Students will maintain and operate equipment for maintaining wildlife habitat and supporting a variety of public recreational activities. Students will develop marketing and programming skills for park development, apply management practices to park operations and learn the systems required to maintain public safety. | ~~CTA~~ | — |
| 010740 | **Urban Forestry**<br>The learner will promote the care and management of trees for residential and commercial purposes. Learners will apply principles of soil management, dendrology and pest management to the care and management of trees. Learners will analyze budgets; and develop short and long-range management plans that balance environmental and economic goals and that support sustainable land use patterns. Principles of rigging, advanced rope techniques, and chainsaw applications for tree pruning and removal will be learned. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 010745 | **Wildlife and Fisheries**<br>Learners will apply the principles and practices of resource conservation and management to fish and wildlife populations. Students learn to properly handle wild animals, principles of wildlife nutrition, inventory practices, water quality parameters and testing, and natural and artificial propagation. Learners will apply principles of facility design and layout for managing fish populations. Learners will research and evaluate the impacts of various land practices, legislation, and human activities on habitats and populations. | ~~CTA~~ | — |
| 010910 | **Animal Science and Technology**<br>Learners will develop business leadership, problem-solving and communication skills in relation to the science and technology of animals. Students will learn responsible animal management principles and routine husbandry practices in relation to animal welfare and behavior. Learners will identify and describe the anatomy and physiology of monogastric and ruminant organisms as it applies to nutrition, reproduction, and animal health. Learners will investigate animal genetics and how it impacts principles of animal improvement, selection and marketing. | ~~CTA~~ | — |
| 010915 | **Animal Health**<br>Learners will apply principles of nutritional management for various classes of animals. Learners will analyze nutritional content/quality of feeds; formulate rations; develop feeding recommendations; identify deficiency symptoms and implement corrective methods as needed. Care/management plans are developed that reflect the classification of animals and follows best practices and legal compliance. Learners will monitor/evaluate the quality of animal habitats and estimate carrying capacity as it relates to the impact of the environment and animal health. | ~~CTA~~ | — |
| 010920 | **Livestock Selection, Nutrition, and Management**<br>Learners will apply principles of nutrition, health and reproduction to the management of animals, poultry and fish in production agriculture. Learners will demonstrate understanding of anatomy and physiology and apply genetic principles for improvement. Learners will apply knowledge of animal behavior, welfare, and husbandry principles. Learners will evaluate body/carcass composition and apply marketing principles to the sale and distribution of livestock products. Learners will employ communication, business, and management strategies appropriate for the industry. | ~~CTA~~ | — |
| 010925 | **Companion Animal Selection, Nutrition, and Management**<br>Learners apply principles of nutrition, health and reproduction to the management of animals intended for companionship or research. Through interpretation, problem-solving and diagnostic methods, the | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | learners develop and implement management programs that reflect responsible animal behavior, welfare and husbandry practices. Learners implement principles and practices of nutritional management, responsible breeding and disease management. Safe handling, grooming and training skills are developed and applied. Learners identify business management procedures and understand the importance of business regulations. | | |
| 010930 | **Veterinary Science**<br>Learners will develop knowledge of veterinary pharmacology, radiology and imaging techniques, principles of surgery, safe laboratory skills, and the concepts of ethics and professionalism in the work place. Learners will develop skills in inquiry and statistical methods. Learners will describe causes, symptoms, and treatment of common diseases with special emphasis on developing preventative health management plans and breeding programs. Learners will utilize principles of technology to manage information systems, and research issues affecting the industry. | ~~CTA~~ | — |
| 010935 | **Equine Selection, Nutrition, and Management**<br>Learners are introduced to responsible equine management principals and routine husbandry practices in relation to equine behavior methodology and legal compliance. Learners will apply knowledge of health and nutrition when designing preventative health care plans, breeding plans, and feed management programs. Safe handling, grooming, training, equipment selection/maintenance/use and emergency care techniques are developed and applied. Learners will evaluate responsible stewardship practices and develop production management strategies that emphasize the industries goals through good reproductive decision-making. | ~~CTA~~ | — |
| 010940 | **Zoo and Aquarium**<br>In this course, learners will identify and apply responsible animal science principals and routine husbandry practices to captive animal populations. Learners will apply knowledge of animal behavior, welfare, and husbandry principals to enhance exhibit design, animal enrichment and training plans, and educational and visitor engagement programs. Emphasis will be given to data collection and research techniques. Principles of responsible population control, disease risk and management, and problem-solving/action planning techniques will be examined. | ~~CTA~~ | — |
| 011010 | **Science and Technology of Food**<br>This first course in the pathway examines the research, marketing, processing and packaging techniques applied to the development of food products. Learners will examine principles of food preservation techniques and determine correlations to food sensory, shelf life and | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | food stability. Learners will examine and develop food safety, sanitation, and quality assurance protocol. Government regulations and food legislation will be examined and the implications to food science and technology will be identified. | | |
| 011015 | **Food Marketing and Research**<br>Learners will focus on the stages of research process from research planning to gathering, analysis, and interpretation of data as it relates to food marketing management. Learners will apply knowledge of food additives, nutrition, mixes and solutions to enhance existing food products and to create new processed foods. Learners will identify and describe the impact that technological advances have on food production and availability. Cultural trends and preferences affecting product development will be examined. | ~~CTA~~ | — |
| 011020 | **Meat Science and Technology**<br>Learners will apply food chemistry and microbiology to processing, preservation, packaging, storage and marketing of meat products. Learners will design and implement a quality assurance program that meets legal compliance. Learners will evaluate carcass composition, assign quality grades, and examine valued-added products. Learners will demonstrate knowledge of safety regulations and operate and maintain equipment and facilities. Learners will practice customer service and sales techniques while understanding the scope and importance of business regulations. | ~~CTA~~ | — |
| 011030 | **Applications of Food Science and Safety**<br>Learners will use principles and practices of food processing and packaging to develop solutions for problems in food production, handling and storage. Learners will examine heat preservation, cold processing, food irradiation, fermentation, milling, and hydrogenation processing techniques. Learners will examine the process of food product development and techniques used to measure food sensory aspects, shelf life and food stability. Learners will examine government regulation impact on labeling, new packaging technologies, harvesting, transportation, and the environment. | ~~CTA~~ | — |
| 012010 | **Animal and Plant Biotechnology**<br>Learners will apply principles of chemistry, microbiology and genetics to plant and animal research and product development. They will describe the importance of biotechnology in society and analyze the issues that have affected agricultural biotechnology. Students will apply genetic principals to determine genotypes and phenotypes. Students will describe the parts and functions of animal and plant cells and their importance in biochemistry. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 012015 | **Principles and Practices of Bioscience**<br>Learners will demonstrate proper techniques and procedures that apply in a laboratory environment. They will examine the theory of application and will operate various analytical instruments. Students will apply current Good Laboratory Practice and Good Manufacturing Practices. Learners will demonstrate proper safety procedures used in the laboratory and abide by the compliance standards of regulatory agencies. | ~~CTA~~ | — |
| 012020 | **Genetics of Plants and Animals**<br>Learners will explore the mechanisms of heredity and genetics through food, plant, and animal science. Students will examine DNA and chromosome structure, transcription and gene regulation; replication and cell division; patterns of inheritance; and genetic recombination mutations and their repair. Learners will apply molecular technologies to food, plant and animal research. | ~~CTA~~ | — |
| 012025 | **Bioresearch**<br>Learners will be introduced to the basics of bioinformatics where they will employ mathematical, statistical and computational methods to process large amounts of biologically-derived information. The main techniques that will be examined related to sequence analysis are gene identification, genome sequencing, sequence comparison, and database searching. Students will apply biological principles to understand the application of bioinformatics algorithms and software. | ~~CTA~~ | — |
| 012030 | **Foundations of Sustainable and Innovative Agriculture**<br>This course will focus on the purpose, resources, indoor and outdoor growing operations, production strategies, business development, and financing as it applies to innovative agricultural production in urban, suburban, and rural communities. | ~~CTA~~ | — |
| 012035 | **Precision Applications in Agriculture, Food, and Natural Resources**<br>This course will provide an overview of precision agriculture, emphasizing the integration of technology, data analysis, and sustainable practices to optimize production and resource utilization. Students will gain knowledge in the areas of electrical theory, electronic systems and controls applied to mapping, GIS, and equipment operation. | ~~CTA~~ | — |
| 010125 | **Animal and Plant Science**<br>Students will apply knowledge of animal and plant science to the agriculture industry. They will be introduced to the value of production animals relative to the agricultural marketplace. Students will engage in animal classification and selection, body systems, along with animal welfare and behavior in relation to the production of animals. Students will learn principles of plant anatomy and physiology, and the role of nutrition, deficiencies and growing environment on plant production. Throughout the course, business principles and professional | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | skills will be examined. | | |
| 010130 | **Global Economics and Food Markets**<br>Students will examine economic principles related to agriculture, food, and natural resources along with the operation and use of commodity futures and option markets. Students will learn economic principles with emphasis on their application to the solution of agricultural industry problems. They will examine future exchanges and commodity futures contracts, hedging strategies, as well as put and call options. Throughout the course, students will become familiar with the causes and consequences of economic growth, globalization and development. | ~~CTA~~ | — |
| 010945 | **Animal Anatomy and Physiology**<br>Students will examine the structure and function of the major organ systems as well as the function and principle of blood flow in animals. Students will study internal and external anatomical parts, their functions, and will investigate the relationship among these parts and systems within the body of animal. Throughout the course, students will apply the internal functions of anatomical structures to the business and industry principles of the animal industry. | ~~CTA~~ | — |
| 010640 | **Landscape Hardscapes**<br>Students will learn skills in constructing and installing hardscape features in a landscape. Topics include basic principles of building and implementing designs drawn and drafted from computer-aided designs and blueprints. Students will install artificial lighting, water systems, deck and creative concrete features on job sites. Throughout the course, business management practices, employability skills, and safety procedures will also be emphasized. | ~~CTA~~ | — |
| 010990 | **Energy and Power**<br>Students will be introduced to the many career and educational opportunities that exist in the energy and power industry. Students will research, design, and build a series of authentic, hands-on projects that will enable them to understand the interplay of the generation, distribution and use of energy. Systems thinking will be used to teach how things work by understanding how the parts influence the entire system and how the system impacts the parts. | ~~CTA~~ | — |
| 010995 | **Oil and Gas**<br>Students will be introduced to the many career opportunities that exist in the oil and gas industry. Students will apply skills applicable to exploration, extraction and production of oil and gas. Additionally, students will apply monitoring and control techniques for effective environmental management. Lastly, students will become familiar with wellhead and surface production equipment related to the oil and gas industries. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 010999 | **Clean Energy**<br>Students will apply fundamental science and operating principles of clean energy systems to authentic problems. Such problems involve motors and generators, photovoltaic systems, water and energy conservation, wind turbines, biofuel generation, bioreactors, water power, energy harvesting, fuel cells and nuclear power. Students will use engineering design processes to develop solutions to these authentic problems. | ~~CTA~~ | — |

**Table 20. Career Field 02: Arts & Communications Codes (04xxxx, 34xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 340001 | **Arts and Communication Primer**<br>The worlds of art designers, performers, and media artists intersect historically, culturally and aesthetically. In this introductory course for the Arts and Communication Career Field, students learn the basics of performance, design, audio, and video. They review brochures, photographs, news stories, videos, and other products common to the visual, media and performing arts industries. | ~~CTA~~ | — |
| 340006 | **Business of Arts and Communications**<br>A growing number of professionals make a living in industries related to arts and communications. From event management to tracking expenses, students learn the business side of visual, media, and performing arts. Topics include marketing, branding, producing, promoting, booking, budgeting and merchandising, etc. Students learn and apply intellectual property rights, licensing, copyright, royalties, liabilities, and contractual agreements. They learn how both profit and non-profit organizations businesses operate. | ~~CTA~~ | — |
| 340009 | **Arts and Communication Capstone**<br>Students apply Arts and Communication program knowledge and skills in a more comprehensive and authentic way. Capstones are project/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through partnerships, students combine classroom learning with work experience to benefit themselves and others. These can take the form of mentorship employment, cooperative education, and internships. | ~~CTA~~ | — |
| 340110 | **Media Arts Primer**<br>In this first course of the Media Arts pathway students will learn the basics of how to convey messages through journalism, commercial advertising, and marketing. They review the accuracy and impact of words and visuals used in news, advertisements, and commercials. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | They learn essential terminology and basic tools for delivering messages. They understand the content length, deadlines, and responsibilities of various delivery channels. | | |
| 340115 | **Media Arts Writing**<br>Copy for news stories, technical journals, advertisements and social media has similarities and differences. This course focuses on creating and adapting content for multiple purposes with print, radio, TV and the Web. Students conduct and synthesize research and interviews to write persuasive and unbiased copy. They evaluate and edit text for purpose, style, space limitations, and accuracy. They accentuate messaging with design elements. Strategies to determine audience impact are engaged. | ~~CTA~~ | — |
| 340120 | **Digital Image Editing**<br>This course focuses on manipulating images for final output through print and Web-based production. Students obtain a brief perspective on analog image editing and delve into the world of editing digital photos, illustrations and other artwork. They learn to adjust resolution and exposure, modify color, compress data, and format and manage files. Students will use problem-solving strategies and work collaboratively to complete the creative process with artists, printers and Web developers. | ~~CTA~~ | — |
| 340125 | **Motion Graphics**<br>From script to storyboard and special effects, students develop products focused on a central theme and purpose. Using commercial and open-source digital animation software, they create an illusion of motion that extends beyond traditional frame-by-frame footage. They learn skills and techniques involving music, animation, text, voice, photos and videos. Products are adjusted for access through computers, mobile devices, game consoles, projectors, radio, and TV. | ~~CTA~~ | — |
| 340130 | **Audio Broadcast**<br>Sound is essential to broadcast journalism and advertising. Students compare and contrast how sound alone and sound combined with visuals can entertain, inform, and initiate action. They generate content, record, edit, mix, and produce voice and music for airwaves, podcasts, and/or the internet. They adapt for analog and digital audio while adhering to Federal Communications Commission rules and regulations related to bandwidth and advertising. | ~~CTA~~ | — |
| 340135 | **Musical Engineering**<br>Students put music theory and basic music skill into practice as they engineer sound for live and recorded production. They create, capture, edit, mix, and synchronize music into audio and video tracks of various formats. Topics include acoustics, reflection, absorption of sound and reverberation. Students create products based on research of audience | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | sensitivity and need and do so in compliance with laws related to intellectual property and competition. | | |
| 340140 | **Video Broadcast**<br>This course focuses on video broadcast for the journalism industry. Skills attained include interviewing, image capture, color manipulation, audio and video blend, lighting and editing. Students critique news broadcasts and research content. They plan and shoot video for live and recorded use in a specific time slot while adhering to laws related to defamation, libel, copyright, and privacy. | ~~CTA~~ | — |
| 340145 | **Video Production**<br>This course focuses on video production for commercial use. Students plan and coordinate work with clients to produce projects on a tight timeline. They learn how to read and interpret a script, select and maintain equipment and combine graphics, text and special effects. Skills attained include pre-production documentation and planning; in-production audio and video recording; and post-production editing and distribution. | ~~CTA~~ | — |
| 340150 | **Photographic Composition**<br>Aesthetics and techniques are essential to producing a good photograph. This course focuses on capturing and manipulating images in digital photography with some skill development in darkroom film processing, printing, and enlarging. Topics include camera functions, mechanics of image capture, image manipulation, and print production. Students shoot photographs in various studio and indoor and outdoor settings. | ~~CTA~~ | — |
| 340155 | **Photography Production**<br>Students advance their digital photographic knowledge and skill using camera raw files with a focus on commercial use and knowledge of production software. Emphasis is on creative expression and client communications to increase marketability of product. Topics include white balance, saturation, contrast and color correcting. Students apply copyright and fair use guidelines. | ~~CTA~~ | — |
| 340160 | **Multi-Media Web Production**<br>The focus of this course is on merging different types of media on the Internet. Students combine text, still photography, audio, videography, and graphic arts to create interactive Web pages. They demonstrate creative, digital storytelling accessible from multiple platforms. Students learn project management and marketing. They learn how to create Web content that is accessible by individuals with visual disabilities. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 340165 | **Digital Cinema**<br>Inspiration, technique, and trends are the focus of this single-camera, cinema-style course. Students engage in creative storytelling through concept development, scriptwriting, and storyboarding. They learn to achieve the look of film through lighting and camera technique as well as double-system audio capture. Legal and ethical aspects such as copyright and fair use guidelines are learned. | ~~CTA~~ | — |
| 340210 | **Performing Arts Primer**<br>In this first course for the Performing Arts pathway, students examine how music, dance and theatre disciplines connect to create a production. They compare and contrast different genre, social contexts, and cultural aspects of dance, music and theatre from early Greek to present day. They learn the role of stagecraft, including new and emerging technology. | ~~CTA~~ | — |
| 340215 | **Dance**<br>Performing arts directors and choreographers look for dancer technical strength, preciseness, and ability to engage audiences. In this course, students develop physical stamina and fitness, musicality, expression and sequence retention while learning terminology for dance movement and for the industry. Through solo, ensemble, and improvisational movement, they interpret and communicate stories and feelings. Self-discipline, including emotional and nutritional health, is reinforced. | ~~CTA~~ | — |
| 340220 | **Choreography**<br>The choreographer designs steps and routines. In this course, students critique choreographed works from multiple dance genres. Using this knowledge and research as well as understanding specific characteristics and movements of dance, they compose sequences into their own designs. They alter choreography in solo and/or ensemble work. They work with dancers to maximize aesthetic appeal for the audience while helping them manage physical and psychological demands of a performance. | ~~CTA~~ | — |
| 340225 | **Acting and Script Analysis**<br>This course combines understanding of the relationship between actor and script. Students research major theatre genres and influences, breaking down a script to discover objectives, obstacles, tactics, and character development. They create a script with scenes, plot points, and characters. They learn acting techniques, including imagery, personal associations, and inner monologue. They perform a role within an original or established piece of work. | ~~CTA~~ | — |
| 340230 | **Acting Performance**<br>Meeting expectations of the casting director and audience is critical to any successful performer. This course focuses on maximizing an actor's | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | physical and emotional expression, vocal intonation, memorization, and imagination to convey stories and feelings. Whether spoken or sung, stylistic identity is reinforced. Other topics include material selection, developing a score of action for a role, sustaining a character and self and peer critique. | | |
| 340235 | **Musical Concept**<br>From warm up skills to complex rhythmic and technical passages, students combine theory and technique to sing or play at least one musical instrument. They recognize different harmonic, rhythmic and melodic structures based on culture, era and style. They write, read and understand musical symbols. Other topics include scales and mode studies, dictation, transcriptions and. Students provide and receive performance critiques. | ~~CTA~~ | — |
| 340240 | **Music Ensemble and Composition**<br>In this course, students compose music and perform in groups. They sight read music, blend and balance ensemble instrumental and/or vocal performance and respond to cues with an understanding of stage presence and choreography. They score an original musical piece using notation and sequencing software. Talent and self-confidence is strengthened through practice, social interaction, self/peer critique, and performance. | ~~CTA~~ | — |
| 340245 | **Musical Theatre**<br>The troupe member with abilities in music, dance, and acting has "triple threat" value in musical theatre. In this course, students assume the roles of singer, instrumentalist, actor and dancer as well as director, stage manager, set designer and/or costume technician. Students learn to take, and give orders to accomplish tasks. They analyze historical and current-day exemplary models of musical theatre for story line, musical arrangement, and audience appeal. | ~~CTA~~ | — |
| 340250 | **Stagecraft**<br>Creating the set, balancing the lights, projecting video and engineering the sound all help to accentuate the script and characters in a show. Students learn the skills of stagecraft through research, critique, and hands-on experience. They use technology, background design, makeup, and costuming to enhance overall production with a focus on the script and director vision. | ~~CTA~~ | — |
| 340255 | **Stage Design and Construction**<br>This course focuses on design and construction of what the audience sees around actors. Students analyze scripts and budgets to determine appropriate sets. They create renderings and drawings by hand and through computer drafting programs to present the designer's vision. They develop models, mock-ups, and final construction of scenery. In addition to construction techniques, they acquire workplace skills such | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | as leadership, collaboration, and safety. | | |
| 340260 | **Costuming and Makeup**<br>This course focuses on character design specific to makeup and costumes. Students research, render, and produce masks, hats, dresses, and other attire. They apply actor makeup and choose wigs or hairstyles aligned with a production script and/or purpose. Factors influencing character design are story line, director concept, relationships among characters, character movement, color, and stage lighting. | ~~CTA~~ | — |
| 340310 | **Visual Design Primer**<br>Visual design takes the form of charts, drawings, boxes and more. In this first course for the Visual Design and Imaging pathway, students gain a perspective of symbols, typography and product output. They acquire basic knowledge of today's role of graphics in communication industries. Focusing on the consumer, students analyze products and create their own designs for critique. They learn how safety, deadlines, teamwork, and ethics relate to the work. | ~~CTA~~ | — |
| 340315 | **Visual Creation**<br>A keen eye for detail, art elements, design principles, and styles of art are essential to the world of visual communications. Students learn proper composition with such principles as color theory, typography, and drawing. They create designs targeted for the Internet and for two- or three-dimensional products while adhering to copyright laws and deadlines. | ~~CTA~~ | — |
| 340320 | **Digital Print Design**<br>Starting with understanding target audiences, demographics, product shelf life and sustainability students create designs for two- or three-dimensional products. Using workflow processes, they lay out newsletters, posters, business cards and other products. They create logo and package designs for corporate branding, marketing, and advertising. Critical thinking is engaged in multiple-level critiques. | ~~CTA~~ | — |
| 340325 | **Digital Media Art**<br>This course focuses on digital technology for products accessed through computers, mobile devices, game consoles, projectors, radio, and TV. Students apply techniques to digitize drawing, painting, and typography. They analyze the effects of single-color and multi-color output. They identify advantages and disadvantages of digital communications from philosophical, ethical, creative, and commercial output perspectives. Products are critiqued for design, production quality and customer impact. | ~~CTA~~ | — |
| 340330 | **Visual Distribution**<br>Students analyze customer preferences to determine product creation, production, and delivery. From a four-color vehicle wrap to a spot var- | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | nish that adds spark to an annual report cover, students learn techniques to enhance product uniqueness in the graphic arts industry. They compare the differences of customer impact between using traditional mass distribution to individual consumer targeting. Among strategies engaged are Variable Data Imaging (VDI), Quick Response (QR) codes and e-mail blasts. | | |
| 340340 | **Advertising and Communication**<br>Creators and producers of graphic images must understand how to integrate and adapt creations for multiple marketing purposes. Students research and analyze the power of visuals in advertising campaigns and public relations events. Using the principles of advertising and visual communications, they develop strategies and products for specific purposes and audiences. They use logos, images, and type integrated strategically to create both printed and electronic products on a theme. | ~~CTA~~ | — |

**Table 21. Business Administration Courses. This includes courses from three career fields:** 03–Business & Administrative Services (14xxxx); 07–Marketing (04xxxx); and 15–Finance (14xxxx)**.**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| The following courses can be a part of any of the three business administration career fields: 03–Business & Administrative Services (14xxxx); 07–Marketing (04xxxx); and 15–Finance (14xxxx). | | | |
| 141000 | **Business Foundations**<br>This is the first course for the Business and Administrative Services, Finance, and Marketing career fields. It introduces students to specializations within the three career fields. Students will obtain knowledge and skills in fundamental business activities. They will acquire knowledge of business processes, economics, and business relationships. Students will use technology to synthesize and share business information. Employability skills, leadership, communications, and personal financial literacy will be addressed. | ~~CTA, BUS~~ | — |
| 141025 | **Management Principles**<br>Students will apply management and motivation theories to plan, organize, and direct staff toward goal achievement. They will learn to manage a workforce, lead change, and build relationships with employees and customers. Students will use technology to analyze the internal and external business environment, determine trends impacting business, and examine risks threatening organizational success. Ethical challenges, project management, and strategic planning will also be addressed. | ~~CTA, BUS~~ | — |
| 141030 | **Strategic Entrepreneurship**<br>Students will use innovation skills to generate ideas for new products | ~~CTA, BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | and services, evaluate the feasibility of ideas, and develop a strategy for commercialization. They will use technology to select target markets, profile target customers, define the venture's mission, and create business plans. Students will take initial steps to establish a business; Students will calculate and forecast costs, break-even, and sales. Establishing brand, setting prices, promoting products, and managing customer relationships will be emphasized. | | |
| 142000 | **Fundamentals of Business and Administrative Services**<br>This is the first course specific to the Business and Administrative Services career field. It introduces students to the specializations offered in Business and Administrative Services. Students will obtain fundamental knowledge and skills in general management, human resources management, operations management, business informatics and office management. They will acquire knowledge of business operations, business relationships, resource management, process management, and financial principles. Students will use technological tools and applications to develop business insights. | ~~CTA, BUS~~ | — |
| 142005 | **Office Management**<br>Students will apply techniques used to manage people and information in a business environment. Students will learn to build relationships with clients, employees, peers, and stakeholders and to assist new employees. They will manage business records, gather and disseminate information, and preserve critical artifacts. They will also examine contracts, internal controls, and compliance requirements. Business office tools and applications will be emphasized. | ~~CTA, BUS~~ | — |
| 142010 | **Legal Environment of Business**<br>Students will examine all aspects of business law including the judicial system, differences between types of laws and origins of laws, administrative and employment laws and laws impacting individuals as well as businesses. Students will also research real estate and debtor and creditor laws and regulations. Students will learn to support attorneys by conducting legal research and preparing fully-compliant legal documents. Compliance and contract law will be emphasized. | ~~CTA, BUS~~ | — |
| 142015 | **Medical Office Management**<br>Students will carry out procedures used to manage people and information in medical offices. Students will code medical procedures in accordance with applicable guidelines as well as use technology to convert patient information to electronic medical records. They will also manage the insurance billing and collection process, utilize a patient scheduling and registration system, and develop a compliance program. Medical office safety and security will be emphasized. | ~~CTA, BUS~~ | — |
| 142020 | **Operations Management**<br>Students will learn to plan, organize, and monitor day-to-day business | ~~CTA, BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | activities. They will use technology to plan production activities, forecast inventory needs, and negotiate vendor contracts. Students will also calculate break-even, set cost-volume-profit goals, and develop policies and procedures to promote workplace safety and security. They will design sustainability plans and use lean and six sigma principles to plan for quality improvement. Corporate social responsibility, ethics, risk management, and compliance will be emphasized. | | |
| 142025 | **Supply Chain Management**<br>Students will determine how to facilitate the flow of goods from the point of origin to the point of consumption. Students will utilize technology to track supply chains and measure their effectiveness and efficiency. They also will identify opportunities to improve service levels, quality, and costs through supply chains and select strategies for improving customer and supplier relationships. International business, business process analysis, project management, internal controls, and compliance will be emphasized. | ~~CTA, BUS~~ | — |
| 142030 | **Logistics Management**<br>Students will develop plans and networks to move materials, information, products, and services through organizations. Students will analyze transportation cost structures and reverse logistics' costs. They will utilize technology to evaluate warehouse size and space layouts. Students will also design receiving and fulfillment processes and develop preventive maintenance schedules. Requirements for the treatment, storage, and disposal of hazardous materials will be emphasized. Project management techniques and international business will be examined. | ~~CTA, BUS~~ | — |
| 142035 | **Human Resource Management**<br>Students will develop human resources strategies to obtain, retain, and effectively use talent throughout the organization. Students will utilize technology to create job applications, job descriptions, and job profiles to support the talent acquisition process. They will learn to recruit applicants, administer employment assessments, conduct background investigations, and make and communicate hiring decisions. Students will also develop employee handbooks and establish performance improvement processes. Rewards and recognition practices, relationship management and compliance will be addressed. | ~~CTA, BUS~~ | — |
| 142045 | **Business and Administrative Services Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in a Business and Administrative Services program in a more comprehensive and authentic way. Capstones often include project-/problem-based learning opportunities that occur both in and away from school. Under supervision of | ~~CTA, BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
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| | the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | | |
| 143000 | **Finance Foundations**<br>This is the first course specific to Finance. It introduces students to the specializations offered in the career field. Students will obtain fundamental knowledge and skills in accounting, banking services, corporate finance, insurance, and securities and investments. They will acquire knowledge of financial analysis and application, business law and ethics, economics, international business and business relationships. Knowledge management and information technology will be emphasized. Employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 143005 | **Financial Accounting**<br>Students will track, record, summarize, and report a business's financial transactions. They will develop financial documents, project future income and expenses, and evaluate the accuracy of a business's financial information. Students will also apply tools, strategies, and systems to evaluate a company's financial performance and monitor the use of financial resources. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 143010 | **Corporate Finance**<br>Students will manage policy and strategy for corporate budgeting, investment, and financial planning. They will calculate profitability, predict business success and the likelihood of failure, and compare business performance within and across industries. Students will also develop and track the achievement of financial goals. They will determine how to balance risk with return and select strategies for recovering from risky situations and disasters. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 143015 | **Managerial Accounting**<br>Students will use financial information to make strategic business decisions. They will monitor business profitability, measure the cost-effectiveness of expenditures, prepare budget and forecast reports, and set achievable business financial goals. Students will also use critical information on financial documents to determine risks to short-term and long-term business success. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 143020 | **Fundamentals of Financial Services**<br>Students will develop knowledge and skills needed in the banking, insurance, and investment industries. They will analyze banking products | ~~CTA, BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | and services, determine ways in which insurance reduces risk, and calculate insurable losses. Students will also learn to sell financial products and build positive relationships with clients and colleagues. They will use financial ratios to evaluate company performance and select profitable investments for clients. Technology, employability skills, leadership, and communications will be incorporate in classroom activities. | | |
| 143025 | **Financial Services Operations**<br>Students will plan, organize, and carry out day-to-day activities unique to the banking, insurance, and investment industries. They will learn to underwrite loan and insurance applications, handle problem accounts, and investigate and process insurance claims. Students will also evaluate risks faced by financial institutions and develop processes to promote ethically and legally compliant behavior throughout a banking, insurance, or investment company. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 143030 | **Finance Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in a Finance program in a more comprehensive and authentic way. Capstones often include project-/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA, BUS~~ | — |
| 144000 | **Marketing Principles**<br>This is the first course in the Marketing career field. It introduces students to the specializations offered in Marketing. Students will obtain fundamental knowledge and skills in marketing communications, marketing management, marketing research, merchandising, and professional selling. They will acquire knowledge of marketing strategies, market identification techniques, employability skills, business ethics and law, economic principles and international business. Technology, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 144005 | **Marketing Applications**<br>Students will develop and implement marketing strategies and techniques across marketing functions: channel management, marketing research, market planning, pricing, product-/service management, and branding. They will use marketing operations procedures and activities to ensure marketing's efficiency and effectiveness. Students will generate, screen, and develop new product ideas. They will predict economic trends and conditions and determine how cultural intelligence can impact organizations. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 144010 | **Integrated Marketing Communications**<br>Students will create, execute, and evaluate promotional strategies and content for advertising, sales promotion, and publicity/public relations. They will apply project management techniques to guide and control promotional campaign development and execution. Students will incorporate motivation theories, branding techniques and design principles in communications with targeted audiences. They will plan and implement procedures to use marketing communications that mitigate image or brand-damaging issues. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 144015 | **Digital Marketing and Management**<br>Students will apply tools, strategies, and processes to communicate digitally with targeted customers. They will create, implement, and critique online advertising, email marketing, websites, social media, mobile marketing, search-engine optimization, video or images and podcasts/webcasts. Students will apply project management techniques to guide and control digital communications efforts. They will also create and repurpose content for use in digital environments. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 144020 | **Marketing Research**<br>Students will conduct qualitative and quantitative marketing research using primary and secondary data. They will gather, synthesize, evaluate, and disseminate marketing information for use in business decision-making or to address a specific marketing problem or issue. Students will apply project management techniques to guide and control marketing-research activities. They will use statistical techniques to evaluate marketing data. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 144025 | **Merchandising and Buying**<br>Students will determine what to buy, when to buy, how much to buy, and from whom to buy products for resale. They will develop a product | ~~CTA, BUS~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | mix and apply display and visual merchandising techniques. Students will also implement sales support activities, process sales, track products, and plan merchandise flow. Students will establish and grow positive customer relationships. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | | |
| 144030 | **Professional and Technical Sales**<br>In this course, students will demonstrate sales processes and techniques used in a business-to-business environment. They will develop, grow, and maintain positive business relationships. Students will monitor trends and the business environment to determine the impact on their sales, customers, and competitors. They will negotiate and adjust prices and sales terms. Students will manage sales activities and territories. Technology, employability skills, leadership, and communications will be incorporated in classroom activities. | ~~CTA, BUS~~ | — |
| 144035 | **Marketing Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in a Marketing program in a more comprehensive and authentic way. Capstones often include project-/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA, BUS~~ | — |
| 140999 | **Global Logistics and Supply Chain Management**<br>Students will be introduced to basic principles of global logistics and supply chain management internal functions of an organization and how they connect other institutions. Students will research the roles of logistics and supply chain management in a global economy where individuals and organizations have access to markets across the world. Students will apply critical thinking and problem-solving skills to coordinate the movement of goods and services. | ~~CTA~~ | — |

**Table 22. Career Field 04: Construction Technologies Codes (17xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 178000 | **Construction Technology–Core and Sustainable Construction**<br>Students will learn principles in basic safety (10-hr OSHA), construction math, hand and power tool are and operation, blueprint reading, material handling, communication and employability skills. An emphasis will be placed on safe and green construction practices. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 178029 | **Construction Capstone**<br>Students apply Construction Technologies program knowledge and skills in a more comprehensive and authentic way. Capstones are project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through partnerships, students combine classroom learning with work experience to benefit themselves and others. These can take the form of mentorship employment, cooperative education, or internships. | ~~CTA~~ | — |
| 178001 | **Carpentry and Masonry Technical Skills**<br>This first course in the pathway will introduce to students the materials, methods, and equipment used in carpentry and masonry. Students will organize a project work sequence by interpreting plans and diagrams within a construction drawing set. They will lay out and install basic wall, floor and roof applications. Students will perform introductory concrete applications including formwork, reinforcement, mixing, and finishing. Current advancements in technology, safety, applicable code requirements and correct practices are learned. | ~~CTA~~ | — |
| 178003 | **Structural Systems**<br>Students will learn procedures and techniques required for layout and framing of walls and ceilings, including roughing-in door and window openings, constructing corners and partitions; bracing walls and ceilings; and applying sheathing. Students will learn methods of roof, cold formed steel, and wood stair framing. Students will learn site and personal safety, material properties, design procedures, and code requirements for structural systems. | ~~CTA~~ | — |
| 178004 | **Structural Coverings and Finishes**<br>This course will address applications of interior and exterior finish work. Students will identify material properties and select for appropriate application. Students will install thermal and moisture protection including roofing, siding, fascia and soffits, gutters, and louvers. Students will install drywall; trim-joinery and molding and apply wall, floor and ceiling coverings and finishes. Throughout the course, the safe handling of materials, personal safety, prevention of accidents and the mitigation of hazards are emphasized. | ~~CTA~~ | — |
| 178005 | **Masonry-Brick and Block**<br>The focus of this course will be on the technical aspects of masonry with emphasis on developing introductory skills in laying block and brick. They will learn the physical attributes of masonry materials and the tools required in masonry construction. Students will learn the principles necessary to construct structures with a variety of brick and block materials. Throughout the course, the safe handling of materials and personal safety are emphasized. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 178006 | **Concrete and Residential Masonry**<br>In this course, students will learn to read and interpret construction plans and drawings for masonry applications. They will learn to select materials based on physical attributes and job requirements. Students will set grades and construct forms, for concrete foundations, footings, and retaining walls. They will mix, reinforce, pour and finish concrete in various residential and commercial applications. | ~~CTA~~ | — |
| 178002 | **Mechanical, Electrical and Plumbing Systems**<br>Students learn physical principles and fundamental skills across mechanical systems in construction. Students will select materials, assemble, and test basic electrical circuits. Students will select materials and assemble simple copper and plastic plumbing applications for both supply and drains. They will perform simple maintenance of electric motors, electric fixtures and plumbing fixtures. Students will be able to select and install basic ductwork components and learn the operation and maintenance of heating and cooling equipment. | ~~CTA~~ | — |
| 178007 | **Construction Electrical Systems**<br>This introductory electrical course will emphasize electrical theory, materials, equipment. Students will explore the National Electrical Code and learn worksite safety. They will interpret schematics; construct basic circuits, use test equipment and electrical hand and power tools. | ~~CTA~~ | — |
| 178008 | **Residential Electrical Systems**<br>This course will emphasize electrical theory, materials, equipment and general methods used in residential construction. Students will navigate the National Electrical Code, learn worksite safety and understand licensing and permitting requirements. They will interpret plans and job specifications and calculate loads and service requirements. Students will install, test and repair receptacle outlet, lighting and small appliance circuits. They will understand circuit protection concepts and install a subpanel. Specialty circuit installation will be addressed. | ~~CTA~~ | — |
| 178009 | **Commercial and Industrial Construction Electrical Systems**<br>Students will plan and install electrical systems in commercial settings. Students learn worksite safety and understand permitting requirements. Students interpret plans and job specifications and calculate loads and service requirements. Students install, test and repair receptacle outlet, lighting and equipment circuits. They will understand circuit protection concepts and be able to install entrance panels. Specialty commercial circuit installation will be addressed. Students apply operating principles to the installation and troubleshooting of motors and controls. | ~~CTA~~ | — |
| 178010 | **Pipefitting and Plumbing Systems**<br>This course will emphasize the physical principles, general methods, materials and equipment used in the plumbing and pipefitting. Students | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | will learn worksite safety and understand licensing and permitting requirements. They will interpret plans and job specifications and calculate service requirements. Students will rough in water supply and drainage lines following plumbing codes and municipal building standards. Additionally, students will install and maintain plumbing fixtures. | | |
| 178011 | **Residential and Commercial Plumbing Systems**<br>This course focuses on the advanced residential and commercial plumbing systems. Students will plan, install, and maintain water supply, wastewater and fuel supply components following codes and municipal building standards. | ~~CTA~~ | — |
| 178012 | **Heating and Cooling Systems**<br>Students will apply principles of heating and cooling to the installation, troubleshooting and maintenance of residential and commercial Heating, Ventilation, and Air conditioning/Refrigeration (HVAC/R) Systems. | ~~CTA~~ | — |
| 178013 | **HVAC Refrigeration**<br>Students will install, troubleshoot and service residential and commercial refrigeration systems. Students will learn laws of thermodynamics, pressure and temperature relationships, the refrigeration cycle, and refrigerant management. Students will address hydronic systems, chilled water systems, package units, and cooling towers. | ~~CTA~~ | — |
| 178014 | **Sheet Metal**<br>The fundamentals of the sheet metal trade are the emphasis of this course. Students will learn components of a ductwork system and use architect and engineer's scales to read and interpret construction drawings for material calculations and selection. Students will layout sheet-metal patterns using parallel line, radial line, and triangular development procedures. Students will, also fabricate edges, joints, seams, and notches; seal and insulate; and install ductwork systems and accessories. | ~~CTA~~ | — |
| 178016 | **Alternative Power Generation Systems**<br>Students will learn the technology and applications of solar and wind energy with an emphasis on installation and service processes. Content includes identifying the functions of photovoltaic, standby power and electric storage systems. Students will perform battery maintenance and implement principles and guidelines of energy analysis needed to carry out effective energy audits in accordance with standards and codes. | ~~CTA~~ | — |
| 178017 | **Powerline/Hi-Voltage Power Transmission**<br>This course focuses on the principles of hi-voltage power transmission. Students use code to build, maintain and repair both aboveground and belowground electrical transmission systems. Students will apply specific rigging techniques and equipment to field situations. Emphasis is placed on safety around high voltage equipment. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 178018 | **Construction Safety and Crew Leadership**<br>This course covers OSHA standards (30-hr OSHA) and requirements as they apply to the construction industry and crew/project management. Topics include safety and health hazards, safe practices, construction safety management, and crew management. Emphasis is on hazard identification, avoidance, control and prevention. | ~~CTA~~ | — |
| 178019 | **Plan Reading and Estimating**<br>Students learn blueprint reading as it relates to the architecture and construction. Students will use scaling, orthographic projections, dimensioning practices, symbols, notations, and abbreviations to perform area calculations and to interpret floor plan, section, and elevations and develop an estimate of material, time, personnel, and equipment needs, availability, and cost. Using construction plans, students will identify problems or shortcomings related to the layout and installation of materials for the project. | ~~CTA~~ | — |
| 178020 | **Architecture Design – Structural and Mechanical/Electrical/Plumbing**<br>Students will use architecture design principles to organize and arrange structures to create a perspective of a building. Students will use orthographic/pictorial projection, freehand technical sketching and computer-aided drafting (CAD) skills to generate floor and wall plans, elevations, sections, details and schedules. Students will develop sets of structural framing and mechanical working drawings that include plumbing, HVAC and electrical power and lighting plans. | ~~CTA~~ | — |
| 178021 | **Architecture Design – Site and Foundation Plans**<br>Students use advanced architectural design concepts to construct design models including perspective drawings for final presentations. Students use orthographic/pictorial projection, freehand technical sketching and computer-aided drafting (CAD) tools to create site foundation and section plans that include topographical details and schedules. Additionally, students perform zoning analysis, develop preliminary plot plans, and construct grading and utilities plans that include legal descriptions and cut and fill volumes. | ~~CTA~~ | — |
| 178022 | **Construction Management**<br>This course provides an integrated look at balancing the planning, estimating, and directing of construction operations. Students learn the process of creating and monitoring a construction project including standard agreements, bidding, estimates and project schedules. Students will learn to manage change orders, accident prevention and loss control, closeouts, and claims with an emphasis in production and quality control. Additionally, students will apply leadership, communications, and problem solving skills to construction management. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 178023 | **Remodeling/Renovation**<br>Students will apply structural and mechanical skills to remodeling and renovations. Also, students will learn the process of securing the required building permits, the management of subcontractors, and the coordination of formal building inspections. Students will troubleshoot design or logistics issues and provide possible solutions. Throughout the course, the safe handling of materials, personal safety, prevention of accidents and the mitigation of hazards are emphasized. | ~~CTA~~ | — |
| 178024 | **Facility and Building Maintenance**<br>Students are introduced to the maintenance and management processes used in public buildings and industrial facilities. Students will troubleshoot building and systems issues and provide solutions following applicable procedures and standards. Students will operate and maintain machinery and equipment used in grounds and facilities maintenance tasks. Throughout the course, the safe handling of materials, personal safety, prevention of accidents and the mitigation of hazards are emphasized. | ~~CTA~~ | — |
| 178026 | **Heavy Equipment Operations**<br>Students perform heavy equipment operating techniques and perform operator level maintenance. Students will learn to survey using lasers, transits and machine control systems. Additionally, students learn the techniques and processes for clearing, grubbing, stripping, excavating, backfilling, stockpiling, and cutting and spreading of fill material. Throughout the course, safety is emphasized. | ~~CTA~~ | — |
| 178027 | **Construction Surveying and Site Logistics**<br>Students use surveying, topographic, satellite positioning, and geometric instruments to locate and prepare a site for construction. Students establish lot and building lines as well as grade levels, and use site plans and elevation drawings to determine excavation needs. Students locate and mark underground and overhead services, identity soil conditions that may require shoring and position batter boards. Additionally, students identify the parameters for site selection, zoning regulations, and the process for filing building permits. | ~~CTA~~ | — |
| 178028 | **Interior Design**<br>Students learn principles and elements of design as they relate specifically to interior spaces. Students develop functional and aesthetic design concepts with an emphasis in providing design solutions. Students select materials for appropriateness, quality, performance, and cost for interior applications. Students develop an estimate of material, time, personnel, equipment needs, and cost and use presentation techniques, technical drawings, and other visual materials to enhance and present interior designs. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 178040 | **Fundamentals of Architecture and Construction**<br>In this first course in the career field students will be introduced to the basic principles of architecture and construction. During this course students will read and create construction drawings and use hand tools to create basic construction projects and models. Throughout the course, students will use hands-on skills and procedures in a laboratory setting. Additionally, students will investigate career opportunities in construction and architecture related fields. | ~~CTA~~ | — |
| 178030 | **Principles of Wood Construction**<br>Students will engage in the introductory skills utilized in working with various wood construction materials. They will learn to use basic measuring tools, hand tools and machines, common to the wood industry, to construct basic projects. Additionally, students will examine various wood construction materials and their properties. Throughout the course, students will learn components of site and personal safety. | ~~CTA~~ | — |

**Table 23. Career Field 05: Education & Training Codes (35xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 350002 | **Foundations of Education and Training**<br>In this first course to the career field, students will compare the merit of educational and training models to the evolving knowledge base of research and theory that is used to guides practice. They will describe how historical perspectives, economics, politics, and governance that impact the current learning environment. Additionally, students will identify the principles that guide instructional paradigm shifts from the instructor-led to learner-directed instruction, accountability reform, and uses of technology in curriculum design and delivery. | ~~CTA~~ | — |
| 350035 | **Child and Adolescent Development**<br>Students will apply the theoretical foundations of human growth and development that will enhance work with learners. Through observation, the student will determine the learner's stages of social, emotional, and physical development. They will apply linguistic principles and practices in the development of language skills, determine stage of literacy development and implement strategies that support the learner's formal and informal educational readiness. | ~~CTA~~ | — |
| 350030 | **Classroom Management**<br>Students will apply developmentally appropriate techniques to advance learners' social and emotional growth. They will create classroom environments to maximize the learning potential of each learner. Students will develop intervention strategies, utilize conflict | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | resolution principles and involve the stakeholders in the development of individualized behavioral plans. Emphasis will be given to establishing SMART goals for student's self-evaluation to create a student-centered-leaning environment. | | |
| 350235 | **Curriculum and Instruction for Early Childhood Education** Students will apply developmentally and intellectually appropriate pedagogies that promotes physical, cognitive and emotional growth. They will determine curricular goals, create lesson plans, and employ observation and assessment strategies. Application of foundational principles of reading, writing, speaking, and listening skills to enhance the learner's application of literacy will be emphasized. | ~~CTA~~ | — |
| 350020 | **Curriculum and Instruction for Teaching Professions** Students will apply developmentally and intellectually appropriate pedagogies that promotes physical, cognitive and emotional growth. They will determine curricular goals, create lesson plans, and employ observation and assessment strategies. Students will learn to maintain professional identity while applying technology concepts, protocol and practices that impacts the learner's digital footprint will be emphasized. In addition, students will develop online instruction using learning management system platforms. | ~~CTA~~ | — |
| 350015 | **Educational Assessment** Student will utilize assessment data, to develop and improve curriculum and instruction that helps the learner obtain educational readiness and mastery. They will compare assessments for their purpose, value and use and align intervention strategies to assist learners with testing. In addition, students will develop assessments that align performance objectives and delivery model tools using knowledge domains. Emphasis will be given to using assessment as an effective medium for communications between the instructor and the learner. | ~~CTA~~ | — |
| 350400 | **Education and Training Capstone** Students apply Education and Training program knowledge and skills in a more comprehensive and authentic way. Capstones are project/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through partnerships, students combine classroom learning with work experience to benefit themselves and others. These can take the form of mentorship employment, cooperative education, apprenticeships and internships. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 350230 | **Health, Safety and Nutrition**<br>Students will apply principles and practices for creating a productive learning environment that promotes positive interactions for students, staff, and stakeholders. They will identify signs and symptoms of common health issues and diseases and establish policies to promote healthy well-being. Students will identify signs, symptoms and impact of physical and mental abuse and connect to the organizations and agencies committed to providing services and treatment. | ~~CTA~~ | — |
| 350210 | **Infant and Toddler Education**<br>Students will use principles and philosophies to create a framework that supports an effective and responsive learning environment that is age-appropriate to promote the growth and development of infants and toddlers. Regulations and guidelines impacting preschools and daycares will be emphasized. Students will learn to apply effective communication channels that build relationships between the educational environment, families, and communities. | ~~CTA~~ | — |
| 350205 | **Early Childhood Education Principles**<br>In this first course to the pathway, students will research the historical perspectives and theories of early childhood education used in the forming of their own personal educational philosophy. Students will assess legal, ethical and organizational issues. Additionally, students will assess developmental appropriate practices and identify challenging issues associated with the teaching of young children with diverse needs. Career planning, professional guidelines and ethical practices will also be emphasized. | ~~CTA~~ | — |
| 350010 | **Education Principles**<br>In this first course to the pathway, students will research the historical perspectives and theories of education used in the forming of their own personal educational philosophy. Students will assess legal, ethical and organizational issues. Additionally, students will assess developmental appropriate practices and identify challenging issues associated with the teaching children with diverse needs. Career planning, professional guidelines and ethical practices will also be emphasized. | ~~CTA~~ | — |
| 350215 | **Early Childhood Education Language and Literacy**<br>Students will implement instructional strategies to develop young children's reading, writing, listening and speaking skills. They will assess learners' reading ability, establish reading goals and analyze writing samples for comprehension and understanding. The importance of early exposure to reading and writing will be emphasized. | ~~CTA~~ | — |
| 350220 | **Early Childhood Education Observation and Assessment**<br>Students will use formal or informal observations and diagnostics testing to recognize the learner's goal attainment and align strategies and | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | interventions to meet educational readiness. They will use screening techniques to determine social and emotional growth that will promote reading, writing, speaking and listening skills to assess the learner's transition. The role of assessment data in developing suitable teaching responses and strategies will be examined. | | |
| 350225 | **Communities, Schools and Stakeholders**<br>Students will establish activities that promote positive interactions, stakeholder collaboration, and learning opportunities that promotes active engagement. Students will learn techniques that promote the establishment of stakeholder collaboration when identifying community resources that supports learner's informal education, creates a culturally compatible learning environment and supports global perspectives when enhancing opportunities for enrichment. Working with socially, culturally, linguistically diverse families will be emphasized. | ~~CTA~~ | — |

**Table 24. Career Field 06: Engineering & Science Technologies Codes (17xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 175001 | **Engineering Design**<br>The focus of Engineering Design is the application of the engineering design process. Topics include work-processes, optimization methods, design optimization, and risk management tools. Students will use 2D and3D modeling software to help them design solutions to solve proposed problems, document their work, and communicate solutions. Additionally, students will interpret industry prints, and create working drawings from functional models. Emphasis is given to experimental problem solving in real systems. | ~~CTA~~ | — |
| 175002 | **Engineering Principles**<br>This course will introduce students to fundamental engineering concepts and scientific principles associated with engineering design applications. Topics include mechanisms, energy, statics, materials, and kinematics. Additionally students will learn material properties and electrical, control and fluid power systems. Students will learn to apply problem solving, research and design skills to create solutions to engineering challenges. | ~~CTA~~ | — |
| 175003 | **Manufacturing Operations**<br>Students will learn the production processes applied across manufacturing operations. Students will be able to demonstrate a broad array of technical skills with an emphasis given to quality practices, measurement, maintenance and safety. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 175004 | **Robotics**<br>Students will apply the knowledge and skills necessary to program and operate Robots, using the teach pendant as the main interface point. The Students will learn robotic operations and system configurations. Students will code, compile, and debug programs using the robotic programming language. | ~~CTA~~ | — |
| 175006 | **Computer Integrated Manufacturing**<br>In this course students will be introduced to all aspects of computer integrated manufacturing. They will learn about robotics and automation, manufacturing processes, computer modeling, manufacturing equipment, and flexible manufacturing systems. | ~~CTA~~ | — |
| 175007 | **Digital Electronics**<br>Students are introduced to the process of combinational and sequential logic design. The system uses a precise sequence of discrete voltages, representing numbers, non-numeric symbols or commands for input, processing, transmission, storage, or display. Engineering standards and methods for technical documentation will also be learned. | ~~CTA~~ | — |
| 175008 | **Mechanisms and Drives**<br>Students will learn the principles and practices of machine operation and machine applications. They will learn will learn how machine components such as gears, belts, sprockets, bearings, clutches, couplings, springs, etc. contribute to the application for which the machine is designed. They will also examine the basic drives of such mechanisms as electric motors and hydraulic & pneumatic actuators. | ~~CTA~~ | — |
| 175009 | **Engineering Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Engineering program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA~~ | — |
| 175012 | **Analog Based Electronic Devices**<br>Students are introduced to semiconductor diode applications, other two-terminal devices, thyristors, transistors and field effect transistors. Course includes design and analysis of transistor and FET DC bias circuitry. Operational characteristics and applications of FET and diode switching circuitry are studied. Students will examine rectifier circuits, amplifier circuits and zener voltage regulation. Emphasis is on component testing and troubleshooting. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 175015 | **Pre-Engineering Technologies (Middle Level)**<br>Students in the pre-engineering programs acquire knowledge and skills in problem solving, teamwork and innovation. Students explore STEM careers as they participate in a project-based learning process, designed to challenge and engage the natural curiosity and imagination of middle school students. Teams design and test their ideas using modeling, automation, robotics, mechanical and computer control systems, while exploring energy and the environment. | ~~CTA~~ | — |
| 175017 | **Engineering Logic**<br>Students will apply the processes of digital circuit theory, combinational and sequential logic as it relates to circuit design and operation. Students will identify numbering systems, arithmetic and Boolean operations and apply simplification methods. Emphasis will be given to the analysis of wiring schematics and diagrams for accuracy and function. In addition, students will use electronic components to construct and troubleshoot digital circuits. | ~~CTA~~ | — |
| 175100 | **AC Electronic Circuits**<br>Students will learn the fundamental principles of electricity with emphasis on AC (alternating current) circuits. They will use concepts of Ohm's Law, the Power Formula, and Kirchhoff's Laws with series, parallel, and series-parallel circuit applications. Additionally, students will be introduced to the relationship between electricity, magnetism, and motor theory. Lastly, students will learn principles of electrical safety, breadboard wiring, basic circuit troubleshooting, operation of function generator, digital multimeter (DMM) and oscilloscope. | ~~CTA~~ | — |
| 175105 | **DC Electronic Circuits**<br>Students will learn the fundamental principles of electricity with emphasis on DC (direct current) circuits. They will learn terminology associated with DC circuits and apply the concepts of Ohm's and Kickoff's Laws as they apply to series, parallel, and series-parallel circuits. Students will also learn electrical safety, basic circuit troubleshooting, operation of DC power supply and digital multimeter (DMM) use. Lastly, students will also learn to draw circuit schematics and breadboard circuits. | ~~CTA~~ | — |
| 175990 | **Automated Materials Joining Technology**<br>Students will be introduced to innovative materials development and use, structural design and product integrity in relation to automated materials joining. Students will explore materials joining and forming methods, computer-aided design and automated systems that transform design concepts into fully developed products. Lastly, students will be introduced to a variety of career possibilities. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 175995 | **Innovations in Science and Technology**<br>Students will be introduced to technological literacy and stimulate their interest in pursuing a career in science, technology, engineering and mathematics (STEM). Students will engage in hands-on experiences they need to be successful in the new global workforce. Finally, students will apply critical thinking skills to solving complex real-world problems. | ~~CTA~~ | — |
| 175999 | **Aerospace Engineering**<br>Students will explore the designing, building, testing and analyzing science behind the forces and physical properties of planes, rockets and unmanned vehicles. They will utilize tools such as spreadsheets and sensing systems to collect and analyze data. Further, students will use technology to effectively solve real-world, challenging problems with business and industry partners. Lastly, students will explore the future of the aerospace industry. | ~~CTA~~ | — |

**Table 25. Career Field 08: Government and Public Administration Codes (360230)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 360230 | **Government and Public Administration**<br>Students will focus on those careers that are inherent to government, as well as other career fields that are utilized in a government and public administration context. | ~~CTA~~ | — |

**Table 26. Career Field 09: Health Science Codes (07xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 072001 | **Health Science and Technology**<br>This first course in the career field provides students an overview of the opportunities available in the healthcare industry. Students will learn fundamental skills in effective and safe patient care that can be applied across a person's lifespan. They will also be introduced to exercise science and sports medicine, the field of biomedical research and the importance of managing health information. | ~~CTA~~ | — |
| 072000 | **Exercise and Athletic Training**<br>In this, first course students will apply procedures and techniques used in athletic training and in the care and rehabilitation of athletic injuries and therapeutic exercise. Topics include injury prevention, | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | conditioning, and wound care techniques of the musculoskeletal system. Students will learn techniques in the analysis of mechanical factors related to human movement. In addition, current trends, technology, legal considerations, and the role of exercise science in relationship to other health fields will be emphasized. | | |
| 072005 | **Bio-Statistics in Exercise Science and Sports Medicine**<br>Students will use fundamental qualitative analysis to study the human body's responses to exercise. Topics include respiratory response to exercise, metabolism and energy production, body composition, healing rate of tissues, and cardiovascular conditioning. Students will use therapeutic exercise and the application of modalities to restore or facilitate normal function or development. Developing and implementing exercise test protocols, and emergency procedures will be emphasized. | ~~CTA~~ | — |
| 072010 | **Exercise Physiology and Biochemistry**<br>Students will learn to critically evaluate acute and chronic conditions associated to the human body's responses to exercise. Students will pre-screen individuals to identify the benefits and risks associated with physical activity. Students will coordinate exercise tests in order to measure body compositions, cardiorespiratory fitness, muscular strength/endurance, and flexibility. Emphasis is placed on developing conditioning programs that address pre-assessment needs, enhance mobility and build muscle strength. | ~~CTA~~ | — |
| 072015 | **Nutrition and Wellness**<br>Students will increase their knowledge of comprehensive health and wellness. Students will be able to identify the components of fitness and communicate the relationship between physical fitness, physical performance, injury prevention, and nutritional intake. Students will evaluate an individual's state of nutrition based upon the impact of personal choices and social, scientific, psychological and environmental influences. Further, students will calculate an individual's kilocalorie burn rate and recommend an ideal diet and physical fitness plan. | ~~CTA~~ | — |
| 072020 | **Fitness Evaluation and Assessment**<br>Students will complete comprehensive fitness evaluations and develop individualized training programs. Students will administer lab and field tests of cardiovascular endurance, body composition, joint flexibility and muscular strength, power, and endurance. Emphasis is placed on assessing body composition, neuromuscular flexibility, agility, balance, coordination, and proprioception. Additionally, students will identify components of physical fitness and communicate how physical activity impact health and wellness. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 072025 | **Athletic Injuries and Prevention**<br>Students will identify signs and symptoms of injury and apply emergency procedures and techniques used in the immediate care of athletic-related trauma. Students will learn clinical and field evaluative processes, injury prevention techniques, conditioning techniques, treatment, taping, bracing, and rehabilitation of musculoskeletal injuries and conditions. Students will design and implement conditioning programs, including nutritional considerations and ergogenic aids. Emphasis is placed on the synthesis of information gathered through injury history, observation, and manual muscle testing. | ~~CTA~~ | — |
| 072030 | **Sports Exercise Psychology**<br>Students apply practical and theoretical information as it relates to psychology of sport. Students analyze the reciprocal relations among physical activity, exercise behavior, and biochemical and physiological adaptation. Topics include theories of behavior change, exercise psychology interventions, and the relationship between exercise and mental health. Further, students will identify psychosocial determinants and effects associated with adopting and maintaining an exercise program and develop strategies for promoting optimal performance in athletes. | ~~CTA~~ | — |
| 072035 | **Principles of Allied Health**<br>In this, first course students will apply knowledge and clinical skills necessary to assess, plan, provide, and evaluate care to patients in varied healthcare settings. Students will apply first aid principles and techniques needed for response to choking, cardiopulmonary resuscitation, and other life-threatening emergencies. Emphasis will be placed on regulatory compliance, patient safety, pathophysiology, and medical interventions. Additionally, this course introduces psychomotor skills needed to assist individuals in meeting basic human needs. | ~~CTA~~ | — |
| 072040 | **Human Anatomy and Physiology**<br>In this course, students will demonstrate knowledge of body systems with emphasis on the interrelationships between structure and physical function. Students will analyze and evaluate how the body systems respond to physical activity, disease, and aging. Students will use data acquisition software to monitor abnormal physiology and body functions (e.g., muscle movement, reflex, respiratory, and voluntary actions). Further, students will analyze descriptive results of abnormal physiology and evaluate clinical consequences. | ~~CTA~~ | — |
| 072045 | **Human Pathophysiology**<br>In this course, students will identify the causes, processes, and changes in body organs and tissues that occur with human illness. Topics include identification of clinical characteristics and effects of | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | diseases, mechanisms causing alterations in cellular activity, maintenance of cellular tissue oxygenation, fluid and electrolyte balance, neuroendocrine control of the body, and diagnostic methodology. Students will interpret and use clinical data and patient health history to assemble a comprehensive health assessment. | | |
| 072050 | **Patient Centered Care**<br>Students will apply psychomotor nursing skills needed to assist individuals in meeting basic human needs. Students will implement interventions following a nursing assistant plan of care. Students will collect patient's vital signs including temperature, pulse rate, respiration rate, and blood pressure. Students will perform phlebotomy procedures with emphasis on infection prevention, universal precautions, proper patient identification, specimen acquisition, handling, and processing. Additionally, students will observe patients' physical, mental, and emotional conditions and document any change. | ~~CTA~~ | — |
| 072055 | **Patient Centered Care and Diagnostics**<br>In this course, students establish and implement treatment plans while providing primary nursing care. Topics include pharmacology, phlebotomy, mental health nursing and acute care nursing. Students use diagnostic techniques to develop patient health assessments. Emphasis is placed on the synthesis of information gathered through health history, observation, and the detection of deviations and variations from normal physical characteristics. In addition, students learn the legal and ethical principles needed to function within the scope of practice. | ~~CTA~~ | — |
| 072060 | **Lifespan Development and Medical Intervention**<br>Students gain necessary skills and knowledge to meet the needs of individuals from infancy through the human life cycle in a safe, legal, and ethical manner using the nursing process. Topics include physical, psychological, and cultural variations associated with maturing and aging. Emphasis will be placed on regulatory compliance, patient assessment, patient safety, and medical interventions. Additionally, students use psychomotor nursing skills to assist in day-to-day patient care activities. | ~~CTA~~ | — |
| 072065 | **Mental Health**<br>Students learn contemporary mental health theories related to psychiatric disorders and mental diseases. Students will differentiate between stress, anxiety, and crisis, and identify methods to maintain mental health, including problem-solving techniques, treatment and intervention strategies. Students will assess, plan, implement and evaluate the mental health needs of the client. Additionally, students will use therapeutic communication techniques and be able to discuss documentation guidelines and the plan of care with the patient. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 072066 | **Integrated Behavioral Health**<br>Students will identify contemporary behavioral health theories related to psychiatric disorders and mental diseases. Students will differentiate between stress, anxiety, and crisis to identify methods to maintain mental health, including problem-solving techniques, treatment, and intervention strategies. Students will assess, plan, implement, and evaluate needs of the client as it pertains to trauma-informed care, crisis intervention, or substance abuse. Additionally, students will use therapeutic communication techniques, discuss documentation guidelines and plan of care with the patient. | ~~CTA~~ | — |
| 072070 | **Surgical Support**<br>Student demonstrates knowledge and skill necessary to carry out delegated tasks associated with the safe and efficient operating room support functions and related procedures. Topics include surgical technology theory, patient care concepts, and sterilization techniques. Student will assist with the passing of instruments and the positioning of patients. Additionally, students will prepare patients for transport to and from surgery, maintain equipment and supplies, and prepare the operating room for surgery. | ~~CTA~~ | — |
| 072075 | **Dental Technology**<br>Students will demonstrate knowledge and skills associated with the practice of dentistry. Topics include principles of dental procedures and comprehensive dental care; infection control in dentistry; and dental specialties including radiology and laboratory procedures. Students will perform chair-side assisting techniques including instrument sterilization, fluoride applications, dietary analysis, and assisting physician. Emphasis is given to terminology, instruments and equipment, and patient communication. Additionally, students maintain accounts and inventory, records and appointments. | ~~CTA~~ | — |
| 072076 | **Dental Radiography**<br>Students will perform procedures to expose, process, and interpret dental radiographs. Students will apply knowledge of radiation physics, infection prevention and quality control standards that are appropriate to the clinical setting. Students will apply effective communication skills for interacting with diverse patient populations and proper procedure documentation according to business and industry standards. | ~~CTA~~ | — |
| 072080 | **Oral Diagnosis and Treatment Planning**<br>Students gain knowledge of head and neck anatomy with a focus on the oral cavity and teeth. They will study bone structure, cosmetic dentistry, and tooth identification and numbering systems. Students gain knowledge of chemical and physical properties of dental materi- | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | als, their indications for use, and proper manipulation of the materials. Students perform radiographs, impressions, pouring, trimming, and wax bites methods and techniques. Additionally, students educate the patient on dental procedures and comprehensive dental care. | | |
| 072085 | **Pharmacology**<br>Students will apply the principles of pharmacology in order to read, interpret and dispense prescriptions. They will learn how medications are classified and administered. Students will study the impact of drugs on different systems of the body, interaction of drugs, side effects and effectiveness in relation to dosages. | ~~CTA~~ | — |
| 072090 | **Respiratory Technology**<br>Students will be able to collaborate with the respiratory therapist to administer care to patients with heart and lung disorders requiring humidity, medial gas and aerosol therapies. Students will perform diagnostic tests, clean and maintain equipment. Students observe patient responses and progress. Students apply concepts of infection control, basic therapeutic and diagnostic modalities. | ~~CTA~~ | — |
| 072095 | **Opticianry and Vision Care**<br>In this course, students apply optometric examination techniques and applications. Topics include visual acuity, stereopsis, color vision, and Amsler grid. Additionally, students perform patient assessments; demonstrate medical interviewing techniques, collect health history content and prepare medical record documentations. Students will assist patients in frame selection and fittings and educate patient in comprehensive vision care. | ~~CTA~~ | — |
| 072100 | **Clinical Laboratory Techniques**<br>Students will apply practical application of a wide range of clinical duties. Topics covered will include hematology, urinalysis, hematostatic processes, body chemistry, microbiology, and blood typing. Students will perform laboratory exercises illustrating principles of the cell and human physiology. Emphasis is given to safe handling, collection procedures, and preparation of specimens. Additionally, students will correlate and document clinical findings and maintain quality management in a clinical laboratory. | ~~CTA~~ | — |
| 072105 | **Health Science Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Health Sciences program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | a variety of delivery methods including cooperative education or internship. | | |
| 072110 | **Principles and Practices of Biomedical Technologies**<br>In this first course, students will use concepts, procedures, and equipment common to a professional medical laboratory. Students conduct problem-based studies, apply scientific methodology and use descriptive statistics to communicate and support predictions and conclusions. Students will follow procedures and protocols for handling, transporting, storing, and preparing specimens. Further, students will sample, monitor, and record environmental conditions of the facilities. Emphasis is given to demonstrating professional and ethical behavior associated with the medical field. | ~~CTA~~ | — |
| 072115 | **Biomedical Engineering**<br>Students learn the use of cell culture techniques for bioscience research and commercial applications. Topics include cultivation of cell lines, bench-top fermenter management, detection of contamination, and an introduction to bioassays. Students will use microbiological techniques to manipulate, evaluate, and study cell growth. Focus will be on media formulation, preparation, autoclaving, and clean up procedures for the vessel and accessories. Further, students will implement quality control methods, maintain records and ensure compliance with regulatory requirements. | ~~CTA~~ | — |
| 072120 | **Biochemistry of Health**<br>This course introduces biochemical methods, analysis, and techniques used in the bioscience research and development industry. Students will learn the chemistry of organic macromolecules, intermediary metabolism and the relationships to the human body. Topics also include structures, properties, functions, reactivity, and synthesis of simple organic molecules. Students will monitor, record, and maintain integrity of equipment and instrumentations; environmental conditions of the facility; and inventory. | ~~CTA~~ | — |
| 072125 | **Biotechnology for Health and Disease**<br>This course explores techniques for extracting, separating, and assaying carbohydrates, lipids, and proteins from biological samples. Topics include mechanisms for regulating metabolism and gene expression. Students will describe the morphology and process of reproduction of microorganisms important in clinical disease and biotechnology applications. Students will perform assays as a diagnostic tool to detect the presence of a pathogen. Further, students will perform separation techniques including chemical separations, centrifugation, distillation, and filtration and interpret results. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 072130 | **Genetics of Disease**<br>Students gain knowledge and skill in genetic principles and molecular methods of analysis. Topics include enzymology, protein purification, and gene expression and organization. Students perform bio-molecular applications using knowledge of nucleic acid structure and function, DNA replication, transcription, translation, chromosome structure and remodeling and regulation of gene expression in prokaryotes and eukaryotes. Additionally, students will use electrophoresis to separate nucleic acids and proteins to determine molecular weight. | ~~CTA~~ | — |
| 072135 | **Health Information Technology**<br>Students will design, develop, and assess information systems and processes used in the management and maintenance of health record systems. Topics include information technology, health care systems, health data collection and project management. Students will design and maintain medical databases, computer networks, and internet or multimedia applications. Emphasis is placed on data management, quality and security. Additionally, students evaluate the impact of information technology on the clinical process, clinical outcome, organizations, and resources. | ~~CTA~~ | — |
| 072140 | **Health Information Management**<br>This course introduces Health Information Management (HIM) and its role in healthcare delivery systems. Topics include standards, regulations and initiatives; payment and reimbursement systems, healthcare providers and disciplines; and electronic health records (EHRs). Emphasis will be placed on procedures for completion, maintenance, and preservation of health information. Students will gain knowledge and skills in Current Procedural Terminology (CPT) coding system used to assign valid procedure and service codes, including general content, and coding guidelines. | ~~CTA~~ | — |
| 072145 | **Billing and Coding**<br>Students develop, evaluate, and implement billing and record systems for health information data using various classification systems to code and categorize patient information. Topics include health record content and structure, diagnostic coding, legal and compliance requirements. Students will record transactions, process payments, and manage patient accounts. Further, students gain knowledge using coded data to produce and submit claims to insurance companies; reviewing and appealing unpaid and denied claims; and for handling collections on unpaid accounts. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 072150 | **Medical Terminology**<br>This course focuses on the applications of the rules for constructing and defining medical terms with an emphasis on building a working medical vocabulary. Topics include using the appropriate abbreviations and symbols for anatomical, physiological and pathological classifications and the associated medical specialties and procedures. Students will decipher medical terms by identifying and using word elements with an emphasis on derivation, meaning, and pronunciation. Further, students will interpret and translate medical records and documents. | ~~CTA~~ | — |
| 072155 | **Medical and Dental Office Technology**<br>Students will apply fundamental principles of communication, leadership, technology and management as it applies to the medical office setting. Students will demonstrate documentation and record keeping procedures set forth by national accrediting organizations. | ~~CTA~~ | — |
| 075999 | **Health Informatics**<br>Students will be introduced to the United States health care system and the burden being placed on U.S. businesses and the economy. Students will research techniques to improve the quality of health care and increase efficiency and reduce costs. Additionally, students will design, manage and use technology to analyze data and information that can inform better health-care decisions and, in turn, improve the delivery of health-care services. | ~~CTA~~ | — |

**Table 27. Career Field 10: Hospitality & Tourism Codes (33xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 330130 | **Hospitality and Tourism Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in the program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or apprenticeship. | ~~CTA~~ | — |
| 330000 | **Hospitality Fundamentals**<br>This first course in the career field will introduce students to culinary arts, foodservice operations, lodging, travel and tourism. Students will obtain knowledge of customer service principles and examine the impact of cultural, historical, social and technological developments on | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | key segments of the industry. They will also apply safety and sanitation techniques to prevent and control injuries, illnesses and diseases in the workplace. Business law, employability skills, leadership and communications will be addressed. | | |
| 330100 | **Fundamentals of Food Production**<br>Students will prepare food products and beverages according to standardized recipes. They will apply plating and presentation principles to deliver attractive menu items, establish food specifications and prep lists, and develop ingredient and portion control guides. Safety and sanitation, standard knife skills, and culinary math will be emphasized. Employability skills, leadership and communications will also be incorporated. | ~~CTA~~ | — |
| 330125 | **Baking and Pastry Arts**<br>Students will apply food-science principles to prepare and bake breads, desserts and pastries. They will also use specialized decorating and presentation techniques to decorate cakes, cookies, pastries, and other baked goods. Students will select quality ingredients, determine food costs, and research and develop marketable new recipes and food concepts. Personal safety, food safety, and equipment safety will be emphasized. | ~~CTA~~ | — |
| 330105 | **Contemporary Cuisine**<br>Students will prepare regional and international food products and beverages according to standardized recipes. They will research and develop marketable new recipes, plan and design menus, and calculate food requirements and costs. Selection, use, maintenance and storage of commercial equipment, machines, tools and tableware will be emphasized. Food science, inventory management, food presentation, and safety and sanitation will also be addressed. | ~~CTA~~ | — |
| 330110 | **Dining Room Service and Operations**<br>Students will apply strategies and techniques to identify and meet dining guest needs. They will provide table and beverage service; maintain eating areas, meeting spaces and serving stations; manage online reservations and orders; and monitor table turns, wait lines and table assignments. Nutritional analysis, types of table service, safety and sanitation, cultural intelligence, employability skills and communications will also be addressed. | ~~CTA~~ | — |
| 330120 | **Restaurant Management**<br>Students will apply management principles to plan, organize and direct restaurant staff toward goal achievement. They will hire, train, and supervise employees; establish processes to facilitate restaurant operations; and plan and design menus. Students will also forecast and schedule food production, establish food specifications, select vendors, calculate costs, and purchase food and nonfood products. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | Other topics include food science, nutritional analysis, business law and ethics, economics and marketing. | | |
| 330025 | **Catering and Banquet Service Operations**<br>Students will design and manage catering and banquet operations. They will recommend types of food functions and food-and-beverage services to clients, create menus for special occasions and events, and determine financial requirements. Students will hire, train, and supervise staff; manage event logistics, operations and service providers; and oversee dining room operations. Customer service; food, equipment and site safety; and high-volume food production will also be addressed. | ~~CTA~~ | — |
| 330021 | **Event and Food Planning**<br>Students will design and organize meetings and events. They will analyze risks, identify needs and develop strategies for achieving event goals. Students will also set up event facilities, manage event activities and evaluate event success. Other topics addressed in the course include menu development, customer service, people management, simple food production, sales and marketing. | ~~CTA~~ | — |
| 330040 | **Travel and Adventure Planning**<br>Students will apply knowledge of travel destinations, tourist attractions and events of interest to plan and coordinate travel and tourism activities for customers. They will analyze cultural, historical and environmental factors impacting travel and tourism; examine challenges, opportunities and trends associated with the industry; and develop strategies for promoting travel and tourism. Social media marketing, brand positioning, marketing research and employability skills will also be addressed. | ~~CTA~~ | — |
| 330030 | **Front Office Management and Operations**<br>Students will develop knowledge and skills needed in the lodging industry. Students will perform front-office procedures such as reserving rooms, checking guests in and out, and orienting guests to the lodging property. They will also maintain guest rooms and public areas, develop a housekeeping plan, and establish a schedule for facilities maintenance. In addition, site safety and sanitation, customer service, people management, employability skills, leadership and communications will be emphasized. | ~~CTA~~ | — |
| 330035 | **Hospitality Management**<br>Students will plan, organize, and monitor day-to-day lodging operations. They will use technology to maintain guest room status and accounts, manage lodging property finances, conduct marketing research, and communicate with current and prospective guests. Property sales, property management, people management and strategic planning will also be addressed. | ~~CTA~~ | — |

**Table 28. Career Field 11: Human Services Codes (17xxxx, 99xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 172600 | **Human Services**<br>Utilizing business and industry technical standards, math, science, ELA, social studies and technology with a business process framework, introduces concepts in Human Services leading to pathways in Family & Community Services or Personal Care Services. | ~~CTA~~ | — |
| 172601 | **Barbering**<br>Utilizing business and industry technical standards, math, science, ELA, social studies and technology with a business process framework, instruction and clinical experiences includes haircutting and styling, shaving and massaging with emphasis on hygiene, skin and scalp diseases, and sterilization of instruments and utensils. | ~~CTA~~ | — |
| 174115 | **Microbiology and Infection Control**<br>Students will learn basic bacteriology, infection control, and salon safety practices. Students will be able to recognize infectious disorders and contagious diseases learn the dispensary requirements, product storage, and requirements of the laws and rules, which regulate the cosmetology industry in Ohio. | ~~CTA~~ | — |
| 174120 | **Trichology**<br>Students will learn the anatomy of the head and scalp, structure of the hair and various techniques and procedures for analyzing hair, scalp disorders and diseases. Students will be able to determine hair porosity, elasticity, density, texture and growth patterns as well as conduct chemical tests for treated hair and ability to recommend corrective scalp treatment. | ~~CTA~~ | — |
| 174125 | **Fundamentals of Hair Cutting and Styling**<br>Students will learn basic shampooing, conditioning and haircutting including trimming, wet styling and thermal styling techniques when working with natural and synthetic hair. Students will also learn infection control and safety along with the science of ergonomics. | ~~CTA~~ | — |
| 174130 | **Advanced of Hair Cutting and Styling**<br>Students will learn advanced cutting and formal styling using specialized equipment and techniques. This course offers enhanced training in current trends and razor techniques. | ~~CTA~~ | — |
| 174135 | **Fundamentals of Chemical Services**<br>Students will apply basic skills, knowledge, and safety practices when giving permanent/chemical waves, curl re-forming, chemical relaxers and hair color techniques to include tinting, highlighting, bleaching, and foiling. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 174140 | **Advanced Chemical Services**<br>Students will learn advanced chemical services using specialized products and techniques. Students will do advanced coloring, dimensional coloring, corrective techniques, texturizing, and advanced chemical wave wrapping techniques. | ~~CTA~~ | — |
| 174145 | **Hand & Foot Treatment Fundamentals and Enhancements**<br>Students will learn the knowledge and skills to perform both manicures and pedicures. They will learn how to maintain personal hygiene and infection control. Students will give plain/oil manicures, pedicures, and hand/arm & foot/leg massages. Enhanced hand and foot treatments using specialized products and techniques will be performed. | ~~CTA~~ | — |
| 174150 | **Skin Care Fundamentals and Enhancements**<br>Students will apply the principles of anatomy, skin analysis, infection control and safety to safe hair removal, skincare treatments, and facial massage. Students will use electrical and manipulative facial treatments including masks, packs, and make-up techniques. Students will also learn advanced skin care treatments, targeted massage, and enhancement applications using specialized products and techniques. | ~~CTA~~ | — |
| 174155 | **Salon Operations and Communications**<br>Students will learn the fundamentals of managing a cosmetology salon. Students will learn about employment and customer liability, insurance, leases, record keeping, communication, and sales. | ~~CTA~~ | — |
| 174010 | **Human Services Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Human Resources program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA~~ | — |

**Table 29. Career Field 12: Information Technology Codes (14xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 145120 | **3-D Techniques**<br>Students will use current industry standard commercial and open source programming software to create 3-D visual elements in a web or standalone environment. Students will learn aspects of computer | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | visual production, thought, and application; to map out, design, and test three dimensional elements. | | |
| 145115 | **Animation**<br>Students will use animation and storyboarding techniques to plan the production of an animation project. Students will design from script and storyboard actions in the pre-production planning process. Students will use commercial and open source digital animation software to create finished animations, cartoons, and other short movies. They will accomplish this using animated text, character movements, voice, background sound, sound effects, camera movements, and multiple scenes. | ~~CTA~~ | — |
| 145015 | **Information Technology Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Information Technology program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA~~ | — |
| 145020 | **Computer and Mobile Applications**<br>Students will learn to create applications for mobile devices using a variety of commercial and open source software. They will install these applications, modify them, and develop customer service skills to handle user issues. Knowledge and skills related to customer service in professional offices, small businesses, departments, work groups, and corporate information services will be addressed. | ~~CTA~~ | — |
| 145025 | **Computer Hardware**<br>Students will learn to install, repair, and troubleshoot computer hardware systems. They will perform preventative maintenance practices and learn techniques for maintaining computer hardware security. Communication skills and professionalism in troubleshooting situations will be emphasized. | ~~CTA~~ | — |
| 145030 | **Computer Software**<br>Students will apply knowledge and skills of commercial and open source operating systems in portable, stand alone, and networked devices. Students will install a variety of operating systems manually and using remote assistance. They will learn to configure, modify, and troubleshoot operating systems. Desktop virtualization, system security, and operating system history will be addressed. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 145100 | **Creating and Editing Digital Graphics**<br>Students will learn to design, develop, and produce interactive media projects, web sites, and social media contexts. Students will demonstrate methods of creating professional quality media using commercial and open source software. | ~~CTA~~ | — |
| 145080 | **Database Administration**<br>Students will learn about user rights and responsibilities, concurrency security, reliability, backup and recovery to perform tasks involved in the administration and management of a database system. Students will design, extract and transform data ensuring data quality. Knowledge and skills relating to reporting systems, data warehouses, and data mining will be developed. | ~~CTA~~ | — |
| 145085 | **Database Applications Development**<br>Students will use developer strategies to manipulate data, present database systems theory, and develop database applications. Students will learn to import and export data, manipulate table properties, make advanced queries, and run basic SQL forms and reports. Students will develop macros for automating database tasks and building menu-driven applications. Knowledge and skills of data modeling, diagraming, query writing, and design theory will be developed | ~~CTA~~ | — |
| 145095 | **Design Techniques**<br>Students will learn techniques for transforming photographic images, through use of digital cameras, computers, and mobile devices. To accomplish this, they will learn software photo editing techniques including layering, color correction, masking, and special effects using current commercial and open source programs and applications. | ~~CTA~~ | — |
| 145090 | **Game Design**<br>This course will prepare students to design and program games using commercial and open source programs and applications. Students will learn industry standard programming language constructs to write programs that integrate classes, class methods, and class instances. Students will learn input method handling, animation, collision detection, game physics and basic artificial intelligence. | ~~CTA~~ | — |
| 145005 | **Information Technology**<br>This first course in the IT career field is designed to provide students with a working knowledge of computer concepts and essential skills necessary for work and communication in today's society. Students will learn safety, security, and ethical issues in computing and social networking. Students will also learn about input/output systems, computer hardware and operating systems, and office applications. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 145125 | **Interactive Application Development**<br>Students will learn skills to support and create interactive and engaging components for web and standalone interactive applications. Using commercial and open source programs and applications, students will master web interactivity with advanced techniques. | ~~CTA~~ | — |
| 145105 | **Multimedia and Image Management Techniques**<br>Students will apply principles of image creation, management procedures, and multimedia techniques as they create, revise, optimize, and export graphics for video, print, and web publishing. The course will address issues related to web based publishing, social media, and security. Students will utilize current commercial and open source languages, programs, and applications. | ~~CTA~~ | — |
| 145035 | **Networking**<br>Students will install, configure, and troubleshoot network hardware and peripherals. Students will learn networking by exploring the OSI model, network topologies, and cabling. Students will design simple networks, know how to select physical devices, and be able to configure the equipment. Knowledge and skills relating to the operation and usage of network protocols will be developed. | ~~CTA~~ | — |
| 145045 | **Network Management**<br>Students will perform network administrator duties by installing and configuring network hardware, software, and peripherals. Abiding by IEEE standards and the Open Source Interconnection (OSI) model, students will create advanced networks, assign user rights, and develop knowledge and skills of network hierarchy. Students will demonstrate mastery of topologies, remote connectivity, wireless networking, TCP/IP, network security, and network troubleshooting. | ~~CTA~~ | — |
| 145040 | **Network Operating Systems**<br>Students will perform desktop client administrator duties by providing support for users in various work environments including professional offices, small businesses, work groups, departments, and/or corporate information services (IS). Students will learn to install, configure, and update commercial and open source network operating systems. | ~~CTA~~ | — |
| 145050 | **Network Security**<br>This course will address securing networks and operating systems. Students will learn to secure network communications, computer hardware, and network software. Topics include: network security theory, cryptography, security architecture, firewalls, VPNs, IP Security, and methods of protection. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 145065 | **Object Oriented Programming**<br>Students will learn to represent programming concepts as "objects" that have data fields and associated procedures known as methods. Students will implement classes such as support static, instance method, inheritance, polymorphism, exception handling, and object serialization. A variety of commercial and open source programs and applications will be used. | ~~CTA~~ | — |
| 145060 | **Programming**<br>In this course students will learn the basics of building simple interactive applications. Students will learn the basic units of logic: sequence, selection, and loop. Students will apply algorithmic solutions to problem-domain scenarios. Students will gain experience in using commercial and open source languages, programs, and applications. | ~~CTA~~ | — |
| 145055 | **Routing and Switching**<br>Student will learn the functions, characteristics, and operations of routers and switches. Students will learn about wireless network standards and components and the role that routers play in enabling communications across multiple networks. Students will troubleshoot the routing process. Students will examine the use of Virtual Local Area Networks (VLANs) to create logically separate networks. | ~~CTA~~ | — |
| 145075 | **Systems Analysis and Design**<br>Students will learn the theory and practice of software testing and develop an understanding of the analysis and design phases of software development. Students will effectively use appropriate programming languages and software patterns to improve software development. A variety of commercial and open source programs, applications, and tools will be used. | ~~CTA~~ | — |
| 145110 | **Video and Sound**<br>Students will create professional video and audio productions for distribution in traditional and new media channels. Students will plan, produce, edit, and launch media products. Students will develop scripts and storyboards, compose shots and operate cameras, capture sounds using microphone hardware, apply special effect techniques, and edit to achieve the final product. Students will be able to use animation and graphic design for video. | ~~CTA~~ | — |
| 145070 | **Visual Programming**<br>Students will create event-driven programs using object oriented programming techniques for use in web based and standalone applications. Students will map out, design, and test computer applications, web applications, and mobile applications. Both commercial and open source programs and applications will be used. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 145010 | **Web Design**<br>Students will learn the dynamics of the Web environment while pursuing an in-depth study of both Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS). Web based protocols such as FTP, TCP/IP, and HTTP will be addressed. Students will create a website with tag text elements, special characters, lines, graphics, hypertext links, and graphical tables. | ~~CTA~~ | — |
| 145999 | **Integrated Production Technologies**<br>Students will engage in using innovative industry driven technologies to imagine and design new and improved products. Additionally, students will be introduced to entry-level jobs leading to challenging, high-paying careers. Students will build and maintain cyber-mechanical systems; invent unmanned exploration vehicles; apply electrical and mechanical engineering principles to the construction of production systems; and use logistics to develop solutions to the modern world's most pressing needs and wants. | ~~CTA~~ | — |
| 146005 | **Cybersecurity**<br>Students will learn the components of cybersecurity and the role each plays in preventing, detecting and mitigating vulnerabilities and attacks. Components include the security of the network infrastructure, security of the systems, and the prevention, detection, and mitigation of common vulnerabilities and attacks. Throughout this course, students will examine and implement security safeguards for desktop, network, and application security. | ~~CTA~~ | — |
| 146010 | **Cybersecurity Defense and Reinforcement**<br>Students will learn the process of systematic defense for information technology systems. They will apply knowledge and skills required to secure network resources including infrastructure, operating systems, data, and applications. Students will apply the knowledge of disaster recovery and business continuity. | ~~CTA~~ | — |
| 146015 | **Cybersecurity Testing and Response**<br>Students will apply the skills of systematic testing and planned response to mitigate security concerns in information technology systems. They will describe the need for security, identify and explain security risks, and implement security safeguards. Students will manage threats, deploy countermeasures, and establish strategies to protect business information using risk and incident management. | ~~CTA~~ | — |

**Table 30. Career Field 13: Law & Public Safety Codes (17xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 170346 | **Law and Public Safety Capstone**<br>The course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Law and Public Safety in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA~~ | — |
| 170911 | **The American Criminal Justice System**<br>This first course in the Criminal Justice pathway traces the history, organization, and functions of local, state, and federal law enforcement. Students will study criminal behavior and apply constitutional and criminal law to crime and punishment. Students will learn law enforcement terminology, classifications and elements of crime, and how various court systems are used to judge and punish offenders. | ~~CTA~~ | — |
| 170912 | **Security and Protective Services**<br>Private Security is an ever expanding industry that requires trained professionals that can detect, deter, and investigate crime. The course focuses on private security measures used to protect lives, property, and proprietary information. Students completing the Ohio Peace Officer Training Academy Private Security curriculum provided by an approved instructor will be eligible to sit for the OPOTA certification exam as a private security guard. | ~~CTA~~ | — |
| 170913 | **Police Work and Practice in Public Safety**<br>In this course, students will learn the skills necessary to prevent, detect and react to crime. Students will learn self-defense and subject control techniques, methods to conduct patrols, surveillance, and traffic procedures. Students will understand the ethical and legal responsibilities of police officers on patrol. Additionally, students will learn the operations of police and emergency telecommunication systems. | ~~CTA~~ | — |
| 170914 | **Investigations and Forensics in Criminal Investigations**<br>Forensic Science uses a structured and scientific approach to the investigation of crimes including assault, abuse and neglect, domestic violence, accidental death and homicide. Students will learn the psychology of criminal behavior and apply it to investigative procedures. Students will collect and analyze evidence through case studies and simulated crime scenes such as fingerprint analysis, ballistics, and blood spatter analysis. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 170915 | **The Correctional System and Services**<br>The correctional officer plays a critical role in the criminal justice system. In this course students will learn institutional rehabilitation and community corrections strategies that prepare them for work in a correctional setting. The student will learn the role and responsibilities of a correctional officer including processing inmates, maintaining security in a correctional setting, and understanding inmate mental health needs. | ~~CTA~~ | — |
| 170916 | **Homeland Security: Protecting America's Critical Infrastructure**<br>In this course students will learn techniques to secure and protect America's people and infrastructure from natural and man-made disasters. Students will analyze a range of national security issues. Students will learn to develop and manage local emergency plans. Students will also learn to manage critical incidents through training in the National Incident Management System and the Incident Command System. | ~~CTA~~ | — |
| 170342 | **Foundations of Firefighting and Emergency Medical Services**<br>In this first course in the pathway, Fire Fighting and Emergency Medical Services introduces students to the foundational concepts of firefighting safety and emergency medical services. Students will learn and practice skills outlined in the Ohio Department of Public Safety Fire Protection and Ohio Emergency Medical Services rules and regulations in preparation for Firefighter I&II curriculum and EMT licensure. | ~~CTA~~ | — |
| 170343 | **Firefighter I**<br>The Firefighter I course prepares students for a career in the fire service. Students learn the history of firefighting, fire science and techniques to fight fires and conduct rescues. Students will train with tools, appliances and fire equipment in the classroom and in live fire exercises. Students that successfully complete this course at a chartered institution will be eligible to take the Ohio Firefighter I certification test. | ~~CTA~~ | — |
| 170344 | **Firefighter II**<br>The Firefighter II course builds on the knowledge and skills learned in Firefighter I. In this course students will apply knowledge and skills to advanced training in fire suppression, rescue and hazardous materials operations. Students who have completed Firefighter I and successfully complete this course at a chartered institution will be eligible to take the Ohio Firefighter II certification test. | ~~CTA~~ | — |
| 170345 | **Emergency Medical Technician**<br>Emergency Medical Technicians are first responders who provide basic care to individuals needing medical attention. Students will learn | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | to assess an emergency situation and provide pre-hospital care to stabilize a patient. They will learn the procedures and protocols for patient transport and the transition to advanced medical care. Students who successfully complete this course at chartered institution will be eligible to take the National Registry Exam for Ohio EMT certification. | | |

**Table 31. Career Field 14: Manufacturing Technologies Codes (17xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 176000 | **Gas Metal Arc Welding**<br>Students will safely use the Gas Metal Arc Welding process (GMAW) to join various types of metal. They will cut metals using oxy-fuel processes and perform multiple types of welds in all positions up to overhead. They will select the appropriate type of electrode and shielding gas and adjust welding equipment based on the physical characteristics and properties of the metal. Students will apply their understanding of quality control factors to evaluate weld quality. | ~~CTA~~ | — |
| 176001 | **Shielded Metal Arc Welding**<br>Students will be able to safely use the Shielded Metal Arc Welding process (SMAW) to join various types of metal. They will perform multiple types of welds in all positions up to overhead. They will select the appropriate type of electrode and adjust welding equipment based on the physical characteristics and properties of the metal. Students will apply their understanding of quality control factors to evaluate the quality of welds. | ~~CTA~~ | — |
| 176002 | **Flux Cored Arc Welding**<br>Students will be able to safely use the Flux Core Arc Welding process (SMAW) to join various types of metal. They will perform multiple types of welds in all positions up to overhead. They will select the appropriate type of cored electrode and adjust welding equipment based on the physical characteristics and properties of the metal. Students will apply their understanding of quality control factors to evaluate the quality of welds. | ~~CTA~~ | — |
| 176003 | **Gas Tungsten Arc Welding**<br>Students will safely use the Gas Tungsten Arc Welding process (GMAW) to join various types of metal. They will perform multiple types of welds in all positions up to overhead. They will select the appropriate type of electrode, filler metal and shielding gas and be able to adjust welding equipment based on the physical characteristics and properties of the metal. Students will apply their understanding of quality control factors to evaluate weld quality. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 176004 | **Machine Tools**<br>This course introduces students to all aspects of machining applications in manufacturing. They will be able to perform routine calculations, interpret basic drawings, begin the process of performing accurate measurements and be able to plan simple machining processes. Students will learn the fundamental principles and practices of cutting, drilling and grinding using modern machine tools, hand tools and precision measuring instruments. | ~~CTA~~ | — |
| 176005 | **Machining with Industrial Lathes**<br>This course directs the student in the safe use of different types of manual industrial lathes. Students will use these machine tools to shape, pattern, bore, thread and polish metal and other materials. Students will apply their knowledge of product characteristics, perform necessary calculations, use precision measuring instruments and make all adjustments needed to fabricate products to print dimensions. Students will be able to identify operational problems and provide routine care and maintenance to the lathe. | ~~CTA~~ | — |
| 176006 | **Machining with Industrial Milling Machines**<br>In this course students are directed in the safe use of manual milling machines. Students apply their knowledge of product characteristics, perform necessary calculations, use precision measuring instruments and layout equipment to mill products to print dimensions. Students will use these machine tools to shape, cut, drill and bore and metal and other materials. Students will be able to identify operational problems and provide routine care and maintenance to the manual mill. | ~~CTA~~ | — |
| 176007 | **Computer Numerical Control Technology with Industrial Mills and Lathes**<br>In this course students will use computer numerical control (CNC) programming to mill products comprised of various materials. Students will prepare numerical control programs in positioning systems using standard industrial G and M codes. They will program computerized numerical control mills and lathes. | ~~CTA~~ | — |
| 176008 | **Manufacturing Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Manufacturing program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 176009 | **Welding Technologies**<br>Students will use fundamental welding principles involving shielded metal arc, oxyacetylene, gas tungsten, and gas metal arc welding in the flat, horizontal, and vertical positions. An emphasis is given to electrode selection, equipment setup, operating procedures, welding inspection, and testing. Students will learn joint designs and layout and will be introduced to welding codes and standards. Additional topics include employability skills and an emphasis will be given to personal safety. | ~~CTA~~ | — |
| 176010 | **Principles of Manufacturing**<br>Students will apply knowledge and skills required in the application of standard manufacturing practices including planning, design, and visualization. Students will learn and apply skills related to interpreting drawings, creating documentation and performing measurements. Additionally, students will use principles and techniques of Computer Numerical Control (CNC), employ scheduling, and project evaluation. | ~~CTA~~ | — |
| 176015 | **Welding Fabrication**<br>Students will apply the knowledge and skills to safely fabricate parts by cutting, drilling, bending, shaping, forming, edging and assembling stock to drawing dimensions. They will identify weld types, fasteners, adhesives to join materials. In addition, students will learn and apply standard practices of additive manufacturing. | ~~CTA~~ | — |
| 176020 | **Industrial Maintenance**<br>Students will apply the knowledge and skills for installing, maintaining and safely troubleshooting industrial machinery. Students will learn principles of pneumatic, hydraulic, mechanical, and electrical systems. They will solve practical maintenance problems, read and interpret drawings/maintenance manuals and learn manufacturing process quality practices. Lastly, students will troubleshoot electrical controls, sensors and actuators for automated machinery and manufacturing processes. | ~~CTA~~ | — |
| 176025 | **Industrial Robotics**<br>Students will apply the knowledge and skills to program, safely operate, and troubleshoot industrial Robots. The students will learn industrial robotic operations and system configurations. Throughout the course, students will code, compile, and debug programs using industrial robotic programming language. | ~~CTA~~ | — |
| 176030 | **Introduction to Semiconductors**<br>This course is a broad introduction to semiconductor and integrated circuit manufacturing from a technician and maintenance perspective. In lecture, students will learn about what a cleanroom is, why it's important to gown up, and have a broad non-quantitative introduction to semiconductor processing. In lab, students will use hand-tools | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | to perform inspection, maintenance, and repair of mechanical fasteners and fixtures associated with semiconductor equipment, and gown up to simulate working in a bunny suit. | | |
| 176035 | **Principles of Advanced Manufacturing**<br>This course introduces students to modern manufacturing organizations, technology, business systems, and problem solving. Provides the fundamentals of Lean Manufacturing, Quality Systems and Statistical Process Control, documentation and standard operating procedures, concepts in measurement, geometric dimensioning and tolerancing, visualization, and graphics. | ~~CTA~~ | — |
| 176040 | **Vacuum Systems**<br>This class focuses on the mechanical maintenance, processing, and data collection of vacuum systems typically used in semiconductor processes such as thin film deposition, ion implantation, and reactive ion etching. The lectures consist of a broad introduction to the use of vacuum pumps in semiconductor manufacturing and how to measure vacuum pressure within a multi-pump system. In lab, students will gown up in a bunny suit and simulate working in a cleanroom environment. | ~~CTA~~ | — |

**Table 32. Career Field 16: Transportation Systems Codes (17xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 170350 | **Transportation Systems**<br>Combined with specialization competencies utilizing business and industry technical standards and math, science, ELA, technology, and business process framework, develops technical literacy in transportation systems, leading to pathways in ground and air trans-portation and post-secondary articulation. | ~~CTA~~ | — |
| 170801 | **Maritime Occupations**<br>Utilizing rigorous academics and Maritime industry standards introduce concepts of deck, engineering and other careers in the maritime industry. | ~~CTA~~ | — |
| 177000 | **Ground Transportation Maintenance**<br>In this first course, students will apply skills needed to inspect and perform general service on vehicles. Students will research applicable service information and technical service bulletins, and perform maintenance on vehicles. Students will inspect and service engine, drive train, suspension, steering, electrical and braking systems. Students will perform ignition maintenance including spark plug/glow | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | plug and ignition wire and coil pack replacement. Additionally, students change fluids, filters and inspect vehicles for leaks and fluid condition. | | |
| 177001 | **Ground Transportation Engine and Power Train**<br>Students will inspect, adjust and repair internal combustion engines and drivetrain. Topics include physical and mechanical principles of engines, transmissions and transaxles, differentials and cooling systems. Students will learn precision measurement, inspection, and reconditioning techniques. Students will also identify customer's needs, determine labor rates, and create estimates. | ~~CTA~~ | — |
| 177002 | **Ground Transportation Electrical/Electronics**<br>Student will diagnose and repair vehicle electrical systems, including chassis electrical, charging, starting and lighting systems. Students will learn the fundamentals of direct current (DC) electronics including series, parallel, and series-parallel circuits. Students will use electronic diagnostic tools, read schematics, and utilize printed and electronic repair manuals to troubleshoot electrical circuits, test components and replace defective modules. | ~~CTA~~ | — |
| 177004 | **Ground Transportation HVAC**<br>Students will learn principles of heating, ventilation and air conditioning systems (HVAC) for use in motor vehicles. They will also inspect, diagnose, repair and maintain vehicle air conditioning and heating systems. Students will use service equipment to evacuate, store and charge the air conditioning system. An emphasis will be given to the safe handling of refrigerants following EPA regulations. | ~~CTA~~ | — |
| 177006 | **Automotive Engine Performance**<br>Students will research vehicle service histories using model specific service bulletins. Students will test and diagnose for engine performance in fuel, air induction and exhaust systems using advanced testing procedures. Topics include computerized engine controls including retrieving and recording diagnostic trouble codes using On Board Diagnostics (OBD). Additionally, students will diagnose drivability and emissions problems resulting from malfunctions of interrelated systems. | ~~CTA~~ | — |
| 177007 | **Truck Diesel Engines**<br>Students will inspect, diagnose, and repair diesel truck engines. Students will learn the principles of valve train assemblies, lubrication, intake, exhaust and fuel systems. Additionally, skill development in engine testing, inspection and repair of electronic fuel management systems are emphasized. Students will break down and assemble heavy truck engines and supporting systems. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 177008 | **Sports/Recreational Power Systems**<br>Students learn principles and skills to maintain and repair sports/recreational vehicles. Students will inspect, diagnose, and repair engine, drive train, and suspension systems. Students remove, disassemble, and repair components in engine cylinder head and block assemblies. Students inspect, adjust and repair drivetrain systems including shaft and chain drive components. Additionally, students will inspect, adjust and replace suspension components including shocks, seals and springs. Students will maintain and adjust systems specific to specialized vehicles. | ~~CTA~~ | — |
| 177009 | **Collision Electrical & Mechanical Systems**<br>Students will perform inspections and repair electrical and mechanical damage due to collision. Topics include electrical and wiring harness, suspension, braking and cooling system repairs. Students will service supplemental restraint systems (SRS) and ensure the integrity of the systems. | ~~CTA~~ | — |
| 177010 | **Collision Structural Inspection & Repair**<br>Students will perform automotive collision repair of full and unibody frames and attach non-structural components. Students will apply the skills and knowledge needed to measure and diagnose structural damage, create a parts list, and determine labor costs. Students will remove and replace damaged structural components. Emphasis will be given to joining and cutting aluminum, steel and other metals. Students will maintain tools and facilities while complying with personal and environmental safety practices. | ~~CTA~~ | — |
| 177011 | **Collision Nonstructural Inspection & Repair**<br>Students will learn the skills and knowledge of automotive body panel repairs, replacements, and adjustments. Students will analyze, document and repair nonstructural collision damage. Students will remove corrosion protection, undercoating, sealer, and other protective coatings as necessary to perform repairs. Emphasis will be given to joining and cutting aluminum, steel and other metals. Students will maintain tools and facilities while complying with personal and environmental safety practices. | ~~CTA~~ | — |
| 177012 | **Collision Painting & Refinishing**<br>Students will restore and refinish vehicle exterior body and paint finish. Students will inspect and identify substrate, type of finish, surface condition, and film thickness; develop and execute a plan for refinishing using a total product system. Students will inspect, clean, and determine condition of spray guns and related equipment. Additionally, students will observe safety precautions when using hazardous materials. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 177013 | **Aviation**<br>In this first course, students apply knowledge of aviation theory and navigation to flight performance and planning. Students will apply principles of simple machines and fluid mechanics to aircraft operations. Identification of aircraft engines and airframe related systems will be emphasized. Weather theories and concepts are used to interpret weather-briefing documents. Additionally, students will distinguish among airport environments, and understand rules, regulations and orders relevant to the airport industry. | ~~CTA~~ | — |
| 177014 | **Aviation Maintenance General**<br>Students will apply knowledge of aircraft ground handling safety procedures to aviation maintenance. Students will start, ground operate, service, and secure aircraft. Students will perform aircraft maintenance including detecting, identifying, removal, and treating of various types of corrosion found on ferrous and non-ferrous metals. In addition, students will identify methods of cleaning aircraft and aircraft components. The course content also focuses on developing communication, leadership, human relations and employability skills; and safe, efficient work practices. | ~~CTA~~ | — |
| 177015 | **Aviation Structure and Design**<br>Students will inspect, repair, and refinish aircraft airframes and external components. Students will rig rotary and fixed-wing aircraft, evaluate and repair sheet metal and nonmetallic structures. Students will form, layout, bend and join metal airframe components using welding processes, rivets and fasteners. Students will inspect, repair and assemble wooden, metal, aluminum, fiberglass and composite components. Students will inspect and repair external finishes including surface preparation and refinishing. | ~~CTA~~ | — |
| 177016 | **Aviation Airframe Systems and Components**<br>Students will learn the principles avionics and practical application of AC/DC electrical circuits with an emphasis on airborne installations. Students will learn power calculations, and the relationship of voltage, current, and resistance. Students will inspect, repair, and install instrument, communication and navigation systems. Additionally, students will evaluate and service airframe electrical systems including position, warning, hazard control, ignition systems. | ~~CTA~~ | — |
| 177017 | **Aviation Powerplant Theory and Maintenance**<br>Students will learn the principles of theory, operation, and maintenance of powerplant electrical systems including ignition, starting, and fire protection. Students will inspect, repair, and install aircraft powerplants including reciprocating, radial, and turbine engines. Students examine and service systems that support each engine type including fuel, lubrication and cooling. Additionally, will perform | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | powerplant conformity and airworthiness inspections, troubleshoot malfunctions and service aircraft to assure continued operation and reliability. | | |
| 177018 | **Aviation Powerplant Systems and Components**<br>Students will inspect, repair and replace fuel systems for fixed and rotary wing aircraft. Topics will include troubleshooting and servicing fuel management transfer, pressure fueling, fluid quantity, fuel indicator and temperature warning systems. Additionally, students will evaluate and service unducted fan, fuel dump, and induction and exhaust systems including heat exchangers and superchargers. Students will perform planned preventative maintenance on tools and equipment, and maintain a clean and safe work environment. | ~~CTA~~ | — |
| 177019 | **Aviation Meteorology**<br>Learners apply principles of meteorology forecasting to aviation. Students will take, record, encode, and disseminate surface weather observations using forecasting equipment. Topics include concepts of aviation meteorology in the study of temperature, pressure, moisture, stability, clouds, air masses, fronts, thunderstorms, icing, and fog. Additionally, students will interpret and use of weather information for pre-flight and in-flight support to aviation. | ~~CTA~~ | — |
| 177020 | **Aviation Airport Management**<br>Learners will distinguish between controlled and nontowered fields and apply management principles to airport environments. Students will interpret and use weather, Automatic Terminal Information Systems (ATIS), and Traffic Collision Avoidance Systems (TCAS) to control aircraft operations. Students will sequence aircraft approaches and departures with approach control radar. Students will interpret and use airport lighting, navigation principles and avionic communication systems including Very High Frequency (VHF), Ultra-High Frequency (UHF), radio and phraseology. | ~~CTA~~ | — |
| 177021 | **Aviation Pilot Training**<br>Students will learn the essentials of piloting an aircraft. Students will learn principles of aircraft operations, air traffic control, meteorology, and navigation. Students learn aircraft performance functions including spins, recovery, stalls, landings and takeoffs. Additionally, students learn to use aircraft instruments and flight controls. Students will apply skills to tie-off, transfer and defuel aircraft. An emphasis is given to Federal Aviation Administration regulations, and mitigation of personal and aviation hazards. | ~~CTA~~ | — |
| 177022 | **Aviation Air Traffic Control**<br>Students will learn and simulate fundamentals of air traffic control. Subjects taught include principles of aircraft tracking using radar and | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | transponders, controlling aircraft departures, takeoffs, ground operation and in air flight control. Students will learn and simulate techniques of sequencing aircraft approaches and departures using approach control radar. Students will study concepts of meteorology, the flight environment, identification of emergency codes, fundamental aspects of flight, and air navigation. | | |
| 177023 | **Transportation Capstone**<br>The capstone course provides opportunities for students to apply knowledge, attitudes and skills that were learned in Transportation program in a more comprehensive and authentic way. Capstones often include project/problem based learning opportunities that occur both in and away from school. Under supervision of the school and through community partnerships, students may combine classroom learning with work experience. This course can be delivered through a variety of delivery methods including cooperative education or internship. | ~~CTA~~ | — |
| 177024 | **Unmanned Aircraft Systems**<br>Students will learn the essentials of operating an unmanned aircraft in a variety of environments. Students will learn principles of regulations, operations, air space, and navigation. Additionally, students will acquire and use geospatial information for various applications. | ~~CTA~~ | — |
| 177030 | **Automotive Braking Systems**<br>Students will perform inspections, troubleshoot malfunctions, and service automotive brake systems. Students will identify poor performing hydraulic brake systems and replace malfunctioning components. Additionally, students will disable and enable supplemental restraint systems (SRS) and replace antilock brake systems components. | ~~CTA~~ | — |
| 177031 | **Automotive Steering and Suspension Systems**<br>Students will perform inspections, troubleshoot malfunctions, and service automotive undercarriage systems. Students will install coil and leaf springs, install shock absorbers and struts, and replace wheel bearings. Students will inspect and replace automotive steering components and perform wheel alignments. | ~~CTA~~ | — |
| 177032 | **Truck Braking Systems**<br>Students will perform inspections, troubleshoot malfunctions, and service truck brake systems. Students will identify poor performing air brake systems and replace malfunctioning components. Identifying workplace risk factors associated with repetitive motion and lifting, operating, and moving of heavy objects are emphasized. | ~~CTA~~ | — |
| 177033 | **Truck Steering and Suspension Systems**<br>Students will perform inspections, troubleshoot malfunctions, and service truck undercarriage systems. Students will install leaf springs, | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | shock absorbers, and air suspension components. Students will inspect and replace truck steering components and replace wheel bearings. Additionally, students will perform wheel alignment and tire inspections, diagnostics, and repair. Identifying workplace risk factors associated with repetitive motion and lifting, operating, and moving of heavy objects are emphasized. | | |

**Table 33. Career Field 17: Job Training Coordinating (JTC) Codes (99xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 990405 | **Introduction to Job Training**<br>The initial course in the Job Training Coordination pathway, a specialized community-based work experience program for students with significant disabilities that present challenges to participation in a traditional career-technical education programs regardless of accommodations. This course must be taken in the first year of the program. The program utilizes a job training coordinator to match specific jobs in the community to the individual student's preferences, interests, needs and strengths. Students must be at least sixteen years old, and this program must be identified on the student's individualized education program (IEP). | ~~CTA~~ | — |
| 990410 | **Fundamentals in Job Training**<br>The second course in the Job Training Coordination pathway, a specialized community-based work experience program for students with significant disabilities that present challenges to participation in a traditional career-technical education programs regardless of accommodations. This course is taken in the second and subsequent years of the program, as applicable. The program utilizes a job training coordinator to match specific jobs in the community to the individual student's preferences, interests, needs and strengths. Students must be at least sixteen years old, and this program must be identified on the student's individualized education program (IEP). | ~~CTA~~ | — |

## *Career Based Intervention Section*

**Table 34. Career Based Intervention (CBI) Codes (25xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 250510 | **CBI Language Arts**<br>Content based on academic content standards; for CBI students facing academic barriers. (These courses are always reported in EMIS with Curriculum Element "V3".) | ~~ENG~~ | Language Arts |
| 250519 | **CBI Reading**<br>Content based on academic content standards; for CBI students facing academic barriers. (These courses are always reported in EMIS with Curriculum Element "V3".) | ~~ENG~~ | Reading |
| 251110 | **CBI Mathematics**<br>Content based on academic content standards; for CBI students facing academic barriers. (These courses are always reported in EMIS with Curriculum Element "V3".) | ~~MTH~~ | Mathematics |
| 251310 | **CBI Science**<br>Content based on academic content standards; for CBI students facing academic barriers. (These courses are always reported in EMIS with Curriculum Element "V3".) | ~~SCI~~ | Science |
| 251510 | **CBI Social Studies**<br>Content based on academic content standards; for CBI students facing academic barriers. (These courses are always reported in EMIS with Curriculum Element "V3".) | ~~SOC~~ | — |
| 252010 | **Career Based Intervention Work-Based Learning**<br>Content based on paid cooperative work experiences or non-paid, work-based learning experiences such as job shadowing, short-term field experience, internships, volunteering at non-profit community agencies, career exploration, and/or service learning activities. (These courses are always reported in EMIS with the Curriculum Element "V3".) | ~~CTA~~ | — |
| 252525 | **Career Based Intervention**<br>CBI programs are designed for students ages 12 through 21 in grades 7 through 12 who are identified as disadvantaged (either academically or economically or both) and who have barriers to achieving academic and career success. The goals of the program are to help students improve academic competence, graduate from high school, develop employability skills, implement a career plan and participate in a career pathway in preparation for postsecondary education and/or careers. | ~~CTA~~ | — |

## *Career Development Section*

**Table 35. Career Development Codes (99xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 990361 | **Entrepreneurship Skills (Career Technical)**<br>Exploring owning your own business. | ~~CTA~~ | — |
| 990363 | **Essential Skills for Business**<br>The central theme of this course is the development of students' skills that support business employment and entrepreneurial endeavors. Emphasis is placed on using personal, interpersonal and organizational skills that contribute to the success of a business. Students identify their leadership styles, collaborate with people, develop professional networks, use communication skills, and reflect on their own personal growth. They apply principles needed to contribute to business operations in general and management of projects in particular. | ~~CTA~~ | — |
| 990364 | **Career Connections**<br>In this course, students investigate how classroom learning translates into marketable skills. Through hands-on learning and local business involvement, students will engage in career-related experiences to acquire basic skills in various career fields. This provides students with tangible experiences to begin career decision making. Teachers have the flexibility to select career fields related to Ohio's in-demand jobs represented in the community. | ~~CTA~~ | — |
| 990365 | **Pre-Apprenticeship**<br>In this course, students participate in a recognized pre-apprenticeship that follows an approved operating plan to provide work-based learning experiences in designated occupations or industry sectors in preparation for formal registered apprenticeship training programs. Pre-apprenticeships follow recognition procedures as outlined by ApprenticeOhio, Ohio's State Apprenticeship Council. This course can be used as the fourth course in an approved career-technical education program of study. | ~~CTA~~ | — |

## *Family and Consumer Sciences (Career Technical) Section*

**Table 36. Family and Consumer Sciences Codes (09xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 090191 | **Graduation, Reality and Dual Role Skills (GRADS)**<br>This course will allow pregnant and parenting students to remain in school while developing parenting skills. Topics will include career | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | readiness, financial management, relationship techniques, human growth and development and parenting styles and responsibilities. This is a dropout prevention program. | | |
| 091025 | **Child Development**<br>In this course, students will study the principles of child growth, development, and behavior. An emphasis will be placed on the cognitive development of a child and sensory and motor skills. Additional topics will include childhood diseases, immunizations, theories of development, learning styles and evaluating childcare services. | ~~CTA~~ | — |
| 091410 | **Transitions and Careers**<br>In this course, students will analyze interests, aptitudes and skills to prepare for careers and transition through life. An emphasis will be placed on work ethics, team building, communication and leadership skills. Additional topics will include technology etiquette and career planning. | ~~—~~ | — |
| 091201 | **Introduction to Family and Consumer Sciences**<br>This first course, will provide students with an overview of the four major content areas of Family and Consumer Sciences. Students will be introduced to child development, family relationship concepts and how they relate to family dynamics. Additionally, students will identify financial literacy and consumer economic principles. Students will understand the concepts of design through textiles for personal and home use. Throughout the course, students will develop communication, leadership and career investigation skills. | ~~CTA~~ | — |
| 091205 | **Principles of Food**<br>In this course, students will gain knowledge in food selection criteria and apply preparation methods to promote a healthy lifestyle. Students will apply cooking methods, ingredient selection and nutritional information in the context of selected food dishes. Throughout the course, basic food safety and sanitation techniques will be emphasized. | ~~CTA~~ | — |
| 091210 | **Global Foods**<br>In this course, students will compare cuisines, ingredients and preferred cooking methods of various cultures. The influence of traditions and regional and cultural perspectives on food choices and culinary practices will be emphasized. Students will examine the issues and conditions that affect the availability and quality of food in the global market, and apply advanced cooking techniques, including the use of specialty and advanced equipment in the preparation of food dishes. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 091215 | **Food Science**<br>In this course, students will apply basic culinary practices and understand how flavor, texture and appearance are affected during food preparation. Students will evaluate chemical reactions as they occur in cooking methods and assess how to control high-risk food safety situation. Food safety and sanitation techniques will align to industry-recognized certifications. | ~~CTA~~ | — |
| 091220 | **Culinary Fundamentals**<br>In this course, students will apply fundamental culinary techniques, such as knife handling skills and the recognition, selection and proper use of tools and equipment. An emphasis will be placed on mise en place, the management of time, ingredients and equipment. Students will apply standard recipe conversions using proper scaling and measurement techniques. | ~~CTA~~ | — |
| 091225 | **Principles of Nutrition and Wellness**<br>In this course, students will use principles of nutrition to ensure a healthy body throughout the lifecycle. An emphasis will be placed on planning and preparing meals with an understanding of nutrients and their benefits, portion control and dietary needs. Additional information will include steroid and supplemental use, body weight and management and the implementation of physical activity to maintain a healthy lifestyle. | ~~CTA~~ | — |
| 093010 | **Personal Wellness**<br>In this course, students will analyze personal physical, emotional, social and intellectual growth for a healthy lifestyle. An emphasis will be placed on lifespan wellness by managing stress through relaxation, physical activity and sleep. Additional topics will include human growth development, mental health management, personal hygiene and preparing for emergency medical situations. | ~~CTA~~ | — |
| 093015 | **Human Growth and Development**<br>In this course, students will analyze human growth and development throughout the lifespan. An emphasis will be placed on physical, cognitive, social and emotional growth and development. Additional topics will include human characteristics and traits, genetic defects, parenting styles and responsibilities and cultural differences within a family unit and community. | ~~CTA~~ | — |
| 091403 | **Leadership and Community Engagement**<br>In this course, students will learn how to become an active community member and citizen. An emphasis will be placed on in-service learning, leadership training and teambuilding opportunities. Additional topics will include public policy issues, community and global engagement. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 091053 | **Consumer Economics**<br>In this course, students will study public policy and consumer behavior related to consumer economics. Throughout the course, students will examine laws and regulations that affect the consumer. Additional topics will include consumer expenditures, consumer fraud, global economy, large purchases, and contracts. | ~~CTA~~ | — |
| 091052 | **Personal Financial Management**<br>In this course, students will develop personal financial plans for individual personal well-being. Throughout the course, students will develop financial literacy skills to provide a basis for responsible citizenship and career success. Additional topics will include analyzing services from financial institutions, consumer protection, investing and risk management. | ~~CTA~~ | — |
| 091402 | **Career and College Readiness**<br>In this course, students will develop effective learning strategies and skills to provide a strong foundation for successful lifelong learning. Throughout the course, students will research careers and occupations, review postsecondary admissions qualifications, develop interviewing skills and participate in internships. Additional topics will include principles and techniques of professionalism, networking, conflict-resolution, negotiation, leadership and entrepreneurship. | ~~CTA~~ | — |
| 091500 | **Interior Design, Furnishings and Management**<br>In this Family and Consumer Sciences career field, students will examine design principles used in residential interiors. An emphasis will be placed on incorporating anthropometrics, ergonomics and psychological responses. Additional topics will include the selection and organization of furnishings, floors and wall coverings in living spaces, kitchens and baths. | ~~CTA~~ | — |
| 091505 | **Textile Design, Construction and Maintenance**<br>In this course, students will study the visual appearance of fabric and fashion design. Students will identify, analyze and apply production processes and techniques to textiles. Additional topics will include the maintenance and alterations of textiles products, including home interior accessories and garments. | ~~CTA~~ | — |
| 091501 | **Textiles and Interior Design**<br>In this course students will explore a broad range of topics relating to the various aspects and career opportunities available in the field of textiles and design. The emphasis will be given to textiles project development and developing strategies to maintain the home. Additional topics will include project collaboration, design techniques and environmental sustainability. | ~~CTA~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 093005 | **Personal Wellness and Development**<br>In this course students will develop a personalized approach to healthy living. An emphasis will be placed on developing personal health for an adolescent that can be used as they transitions through life. Additional topics will focus on problem-solving, work ethics, nutritional and food selections, family dynamics and personal health. | ~~CTA~~ | — |

# INTERNATIONAL BACCALAUREATE COURSES SECTION

**Table 37. International Baccalaureate Courses for Diploma Program (32xxxx)**

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 320050 | **IB Mathematics**<br>Based upon the most current International Baccalaureate Program curriculum. | MTH | Mathematics |
| 320150 | **IB Mathematical Studies**<br>Based upon the most current International Baccalaureate Program curriculum. | MTH | Mathematics |
| 320200 | **IB First Language**<br>Based upon the most current International Baccalaureate Program curriculum. | ENG | English |
| 320250 | **IB Second Language – Arabic**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320300 | **IB Second Language – Chinese**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320350 | **IB Second Language – Czech**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320400 | **IB Second Language – French**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320450 | **IB Second Language – German**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320500 | **IB Second Language – Hebrew**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320525 | **IB Second Language – Hindi**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320550 | **IB Second Language – Italian**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320600 | **IB Second Language – Japanese**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320650 | **IB Second Language – Polish**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 320700 | **IB Second Language – Russian**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320750 | **IB Second Language – Swahili**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320800 | **IB Second Language – Spanish**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320850 | **IB Classical Languages (Latin or Classical Greek)**<br>Based upon the most current International Baccalaureate Program curriculum. | FLR | Foreign Language |
| 320900 | **IB Business and Management**<br>Based upon the most current International Baccalaureate Program curriculum. | BUS | — |
| 320950 | **IB Economics**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | Economics |
| 321000 | **IB Geography**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | Geography |
| 321050 | **IB History**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | History |
| 321100 | **IB Islamic History**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | History |
| 321150 | **IB Information Technology in a Global Society (ITGS)**<br>Based upon the most current International Baccalaureate Program curriculum. | TEC | — |
| 321200 | **IB Philosophy**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | — |
| 321250 | **IB Psychology**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | — |
| 321300 | **IB Social and Cultural Anthropology**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | — |
| 321350 | **IB Biology**<br>Based upon the most current International Baccalaureate Program curriculum. | SCI | Science |

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 321400 | **IB Chemistry**<br>Based upon the most current International Baccalaureate Program curriculum. | SCI | Science |
| 321450 | **IB Physics**<br>Based upon the most current International Baccalaureate Program curriculum. | SCI | Science |
| 321500 | **IB Design Technology**<br>Based upon the most current International Baccalaureate Program curriculum. | TEC | — |
| 321550 | **IB Environmental Systems**<br>Based upon the most current International Baccalaureate Program curriculum. | SCI | Science |
| 321600 | **IB Computer Science**<br>Based upon the most current International Baccalaureate Program curriculum. | TEC | — |
| 321650 | **IB Visual Arts**<br>Based upon the most current International Baccalaureate Program curriculum. | FAR | Arts |
| 321700 | **IB Music**<br>Based upon the most current International Baccalaureate Program curriculum. | FAR | Arts |
| 321750 | **IB Theatre Arts**<br>Based upon the most current International Baccalaureate Program curriculum. | FAR | Arts |
| 321775 | **IB Theory of Knowledge**<br>Based upon the most current International Baccalaureate Program curriculum. | SOC | — |
| 322900 | **IB Global Politics**<br>The global politics course explores fundamental political concepts such as power, liberty and equality, in a range of contexts and at a variety of levels. It allows students to develop an understanding of the local, national, international and global dimensions of political activity, as well as allowing them the opportunity to explore political issues affecting their own lives. | SOC | — |

**Table 38. International Baccalaureate Courses for Middle Years Program (32xxxx)**

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 321800 | **IB Mathematics (Middle Years - Grades 7-8)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | Mathematics |

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 321850 | **IB Mathematics (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | Mathematics |
| 321900 | **IB Language Arts A (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | English |
| 321950 | **IB Language Arts A (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | English |
| 322000 | **IB Language Arts B (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | English |
| 322050 | **IB Language Arts B (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | English |
| 322100 | **IB Humanities (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | — |
| 322150 | **IB Humanities (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | — |
| 322200 | **IB Technology (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | — |
| 322250 | **IB Technology (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | — |
| 322300 | **IB Arts (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | Arts |
| 322350 | **IB Arts (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | Arts |
| 322400 | **IB Sciences (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | Science |
| 322450 | **IB Sciences (Middle Years - Grades 4-6)** Based upon the most current International Baccalaureate Program curriculum. | N/A | Science |
| 322500 | **IB Physical Education (Middle Years - Grades 7-8)** Based upon the most current International Baccalaureate Program curriculum. | N/A | — |

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 322550 | **IB Physical Education (Middle Years - Grades 4-6)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | — |

**Table 39. International Baccalaureate Courses for Primary Years Program (32xxxx)**

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 322600 | **IB Mathematics (Primary Years - Grades 1-3)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | Mathematics |
| 322650 | **IB Language (Primary Years - Grades 1-3)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | English |
| 322700 | **IB Social Studies (Primary Years - Grades 1-3)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | — |
| 322750 | **IB Arts (Primary Years - Grades 1-3)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | Arts |
| 322800 | **IB Science & Technology (Primary Years - Grades 1-3)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | Science |
| 322850 | **IB Personal, Social & Physical Education (Primary Years - Grades 1-3)**<br>Based upon the most current International Baccalaureate Program curriculum. | N/A | — |

# SELF-CONTAINED COURSES SECTION

**Table 37. General Education Codes (18xxxx)**

| Subject Code | Description | Suggested Subject Area for Credit | Core Subject Area (for proper cert) |
|---|---|---|---|
| 180108 | **Preschool**<br>Preschool program in a self-contained classroom, this includes course related to ECE, Federal Head Start, and other local programs. | NA | — |

**Table 38. Exceptional Children (for Students with Disability Conditions) Codes (19xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 199000 | **Transition to Post School Readiness**<br>Specialized curriculum designed for students with disabilities 14 years of age and older that provides training for the development of skills that supports the students transition to post school environments, including employment, postsecondary education, independent living, or community participation. | ~~N/A~~ | — |
| Educators should use extended standards to provide content that is directly aligned to Ohio's Learning Standards. Teachers should consider incorporating instruction with individual accommodations or supports students need to access the curriculum as well as non-academic skills needed for student success such as communication, self-determination, fine/gross motor, and social/emotional skills. Daily living and life skills are often represented within the standards as reading, speaking, listening, writing, and economics skills and should be taught and integrated with the extensions. Educational plans should also include any other additional skills necessary for each child's individual education needs and transition planning goals. | | | |
| 196340 | **Learning Progressions (K-2)**<br>Course uses learning progressions to inform instruction with individual accommodations or supports students need to access the curriculum as well as non-academic skills needed for student success such as communication, self-determination, fine/gross motor, and social/emotional skills. Daily living and life skills are often represented within the standards as reading, speaking, listening, writing, and economics skills and should be taught and integrated with the extensions. | ~~N/A~~ | — |
| 196350 | **Extended Standards (grade 3)**<br>Course uses extended standards to inform instruction with individual accommodations or supports students need to access the curriculum as well as non-academic skills needed for student success such as communication, self-determination, fine/gross motor, and social/emotional skills. Daily living and life skills are often represented within the standards as reading, speaking, listening, writing, and economics skills and should be taught and integrated with the extensions. | ~~N/A~~ | — |
| 196360 | **Extended Standards (grades 4-6)**<br>Course uses extended standards to inform instruction with individual accommodations or supports students need to access the curriculum as well as non-academic skills needed for student success such as communication, self-determination, fine/gross motor, and social/emotional skills. Daily living and life skills are often represented within the standards as reading, speaking, listening, writing, and economics skills and should be taught and integrated with the extensions. | ~~N/A~~ | — |
| 196370 | **Extended Standards (grades 7-8)**<br>Course uses extended standards to inform instruction with individual accommodations or supports students need to access the curriculum as well as non-academic skills needed for student success such as | ~~N/A~~ | — |

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| | communication, self-determination, fine/gross motor, and social/emotional skills. Daily living and life skills are often represented within the standards as reading, speaking, listening, writing, and economics skills and should be taught and integrated with the extensions. Educational plans should also include any other additional skills necessary for each child's individual education needs and transition planning goals. | | |
| 196380 | **Extended Standards (grades 9-12)**<br>Course uses extended standards to inform instruction with individual accommodations or supports students need to access the curriculum as well as non-academic skills needed for student success such as communication, self-determination, fine/gross motor, and social/emotional skills. Daily living and life skills are often represented within the standards as reading, speaking, listening, writing, and economics skills and should be taught and integrated with the extensions. Educational plans should also include any other additional skills necessary for each child's individual education needs and transition planning goals. | ~~N/A~~ | — |

# OTHER COURSES SECTION

**Table 39. Other Course Codes (30xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| These courses may be included in district programs and/or graduation requirements. However, these courses are not aligned with the academic content standards and do not represent courses for which credit toward meeting legislated graduation requirements is awarded. | | | |
| 300010 | **Career Exploration**<br>Scheduled time for researching career options. | ~~ELE~~ | — |
| 300020 | **Community Service (Volunteer Program)**<br>Scheduled time for volunteer service projects during or outside the school day. Note: This course cannot earn credit per ORC §3313.60.5. | ~~ELE~~ | — |
| 300030 | **Study Skills**<br>Instruction in strategies to improve learning and develop study skills; e.g., tips to improve study habits and test performance, with limited coverage of new content or the academic content standards for a single or multiple academic areas. | ~~ELE~~ | — |
| 300040 | **School Publications**<br>Scheduled time for production work and related activities of school publications; e.g., advertising and finances, for newspaper and/or yearbook. Activities not aligned with the academic content standards and do not earn English Language Arts credit. | ~~ELE~~ | — |
| 300050 | **Wellness**<br>A course that addresses general wellness strategies. Credit earned is not applied towards meeting graduation requirements for health and physical education due to limited focus on content related to those areas. | ~~ELE~~ | — |

**Table 40. Humanities Codes (31xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| Humanities courses may be included in district programs and may be taught by a teacher holding a valid certificate or instruction may be provided by a team of teachers that collectively hold the appropriate certificates/licenses for the content areas included in the course. | | | |
| 310010 | **Humanities (7-8)**<br>The study of cultural achievements through the integration of literature, the arts, religion, history, and philosophy. ~~(for grades 7-8)~~ | ~~N/A~~ | — |
| 310020 | **Humanities**<br>The study of cultural achievements through the integration of literature, the arts, religion, history, and philosophy. | ~~N/A~~ | — |

**Table 41. Driver Education Code (210100)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 210100 | **Driver Education**<br>Learning experiences provided by the school for the purposes of helping pupils to become good traffic citizens and to operate motor vehicles safely and efficiently. | ~~ELE~~ | — |

**Table 42. ROTC Military Science Code (220001)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| 220001 | **ROTC Military Science**<br>Organized subject matter and learning activities which are concerned with the development in each student attributes of (1) good citizenship and patriotism, (2) self-reliance, leadership, responsiveness to constituted authority, (3) a knowledge of the basic military skills, and (4) an appreciation of the role of the U.S. military in national defense. | ~~ELE~~ | — |

**Table 43. Capstone Codes (37xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| Capstone courses may address any content area. The subject area for awarding credit and the HQT status of the teacher are dependent on the locally chosen focus of the course. | | | |
| 370010 | **Research**<br>A research course provides the opportunity to engage in an in-depth study of an academic topic, problem or idea of personal interest. Research methodology and ethical research skills learned in a seminar course are applied and extended as students delve into planning and implementing an investigation around a research question. A process and reflection portfolio is used to document the study. The course culminates in a paper and presentation with an oral defense. | ~~Varies~~ | Varies |
| 370015 | **Seminar**<br>A seminar course is an opportunity to explore academic and real-world topics through cross-curricular discussions. Divergent perspectives are explored by reading and analyzing articles, research studies and foundational, literary and philosophical texts; listening to and viewing speeches, broadcasts and personal accounts; and experiencing artistic works and performances. The ultimate goal for this experience is to develop the ability to analyze information with accuracy and precision then to create and communicate evidence-based arguments. | ~~Varies~~ | Varies |

**Table 44. Senior Only Industry Credential Codes (38xxxx)**

| Subject Code | Description | ~~Suggested Subject Area for Credit~~ | Core Subject Area (for proper cert) |
|---|---|---|---|
| These subject codes start with "38" and end with the four character Assessment Area Code (FA205; see EMIS Manual Section 2.8 Student Assessment Record) of the Industry Credential Code that is associated with the course. Only assessment codes that are valid for the current fiscal year may be used as the basis for a senior only credential course in the current year. | | | |