

Chapter 130. Texas Essential Knowledge and Skills for Career and Technical Education

Subchapter I. Hospitality and Tourism

§130.251. Implementation of Texas Essential Knowledge and Skills for Hospitality and Tourism, Adopted 2015.

- (a) The provisions of this subchapter shall be implemented by school districts beginning with the 2017-2018 school year.
- (b) No later than August 31, 2016, the commissioner of education shall determine whether instructional materials funding has been made available to Texas public schools for materials that cover the essential knowledge and skills for career and technical education as adopted in §§130.252-130.261 of this subchapter.
- (c) If the commissioner makes the determination that instructional materials funding has been made available under subsection (b) of this section, §§130.252-130.261 of this subchapter shall be implemented beginning with the 2017-2018 school year and apply to the 2017-2018 and subsequent school years.
- (d) If the commissioner does not make the determination that instructional materials funding has been made available under subsection (b) of this section, the commissioner shall determine no later than August 31 of each subsequent school year whether instructional materials funding has been made available. If the commissioner determines that instructional materials funding has been made available, the commissioner shall notify the State Board of Education and school districts that §§130.252-130.261 of this subchapter shall be implemented for the following school year.

§130.252. Principles of Hospitality and Tourism (One Credit), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 9-12. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
 - (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.
 - (3) Principles of Hospitality and Tourism introduces students to an industry that encompasses lodging, travel and tourism, recreation, amusements, attractions, and food/beverage operations. Students learn knowledge and skills focusing on communication, time management, and customer service that meet industry standards. Students will explore the history of the hospitality and tourism industry and examine characteristics needed for success in that industry.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
 - (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) write effectively using standard English and correct grammar;
 - (B) use a variety of credible resources;

- (C) recognize appropriate professional documents used in the hospitality and tourism industry;
 - (D) calculate accurate measurements, numerical concepts such as percentages, and estimations; and
 - (E) understand how scientific principles are used in the hospitality and tourism industry.
- (2) The student uses verbal and nonverbal communication to provide a positive experience for guests and employees. The student is expected to:
 - (A) develop and execute formal and informal presentations; and
 - (B) practice customer service skills.
- (3) The student understands that personal success depends on personal effort. The student is expected to:
 - (A) demonstrate self-responsibility and self-management;
 - (B) explain the characteristics of personal values, ethics, and fundamental principles;
 - (C) display positive attitudes and good work habits;
 - (D) develop strategies for achieving accuracy; and
 - (E) develop organizational skills.
- (4) The student develops an understanding of time management, decision making, and prioritization. The student is expected to:
 - (A) identify and apply effective practices for managing time;
 - (B) analyze the benefits of balancing career and home life;
 - (C) learn and apply steps in the decision-making process; and
 - (D) work independently.
- (5) The student researches, analyzes, and explores lifestyle and career goals. The student is expected to:
 - (A) prioritize career goals and ways to achieve those goals in the hospitality and tourism industry;
 - (B) compare and contrast education or training and certifications needed for careers in the hospitality and tourism industry;
 - (C) examine related community service opportunities; and
 - (D) describe the components and importance of a career portfolio.
- (6) The student uses technology to gather information. The student is expected to:
 - (A) understand the need for computer applications to perform workplace tasks;
 - (B) recognize that types of computerized systems are used to manage operations and guest services in the hospitality and tourism industry; and
 - (C) discuss why computerized systems are used in operations and guest services in the hospitality and tourism industry.
- (7) The student demonstrates leadership, citizenship, and teamwork skills required for success. The student is expected to:
 - (A) develop team-building skills;
 - (B) develop decision-making and problem-solving skills;
 - (C) conduct and participate in effective meetings;

- (D) identify leadership and teamwork qualities that create a pleasant working atmosphere; and
- (E) identify community service activities related to the hospitality and tourism industry.
- (8) The student explains how resources (employees, guests, and property) are managed to minimize losses or liabilities in the hospitality and tourism industry. The student is expected to:
 - (A) identify and explain job safety and security practices;
 - (B) recognize and implement the basics of sanitation;
 - (C) understand and demonstrate procedures for cleaning, sanitizing, and storing equipment and tools; and
 - (D) determine how environmental issues and trends affect the hospitality and tourism industry.
- (9) The student explores the history of the hospitality and tourism industry. The student is expected to:
 - (A) examine the varied operations required within the hospitality and tourism industry;
 - (B) understand the job qualifications for various careers in the hospitality and tourism industry; and
 - (C) differentiate amongst lodging, travel and tourism, recreation amusements, attractions and resorts, and food and beverage service.
- (10) The student demonstrates research skills applicable to the hospitality and tourism industry. The student is expected to:
 - (A) develop technical vocabulary of the hospitality and tourism industry;
 - (B) design a customized product for the hospitality and tourism industry; and
 - (C) identify local and regional trends and issues in the hospitality and tourism industry.
- (11) The student understands the importance of customer service. The student is expected to:
 - (A) determine ways to provide quality customer service;
 - (B) analyze how guests are affected by employee attitude, appearance, and actions; and
 - (C) examine different types of service across the industry.

§130.253. Introduction to Culinary Arts (One Credit), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 9 and 10. Recommended prerequisite: Principles of Hospitality and Tourism. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
 - (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.
 - (3) Introduction to Culinary Arts will emphasize the principles of planning, organizing, staffing, directing, and controlling the management of a variety of food service operations. The course will provide insight into the operation of a well-run restaurant. Introduction to Culinary Arts will provide insight into food production skills, various levels of industry management, and hospitality

skills. This is an entry level course for students interested in pursuing a career in the food service industry. This course is offered as a classroom and laboratory-based course.

- (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
- (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) model effective oral and written communication;
 - (B) practice professional grooming and hygiene standards;
 - (C) exercise punctuality and time-management skills;
 - (D) demonstrate self-respect and respect for others;
 - (E) demonstrate effective team work and leadership; and
 - (F) employ initiative, adaptability, and problem-solving techniques in practical applications.
- (2) The student gains academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within the restaurant food service industry. The student is expected to:
 - (A) organize oral and written information;
 - (B) compose a variety of written documents such as menus, presentations, and advertisements;
 - (C) calculate numerical concepts such as weights, measurements, and percentages;
 - (D) identify how scientific principles are used in the food service industry; and
 - (E) use mathematics and science knowledge and skills to produce quality food products.
- (3) The student uses verbal and nonverbal communication skills to create, express, and interpret information to establish a positive work environment. The student is expected to:
 - (A) develop and deliver presentations;
 - (B) identify various marketing strategies used by the food service industry such as traditional and innovative marketing strategies;
 - (C) demonstrate proper techniques for answering restaurant phones;
 - (D) relate interpersonal communications such as verbal and nonverbal cues to enhance communication with coworkers, employers, customers, and clients; and
 - (E) demonstrate active listening skills to obtain and clarify information.
- (4) The student solves problems using critical thinking, innovation, and creativity independently and in teams. The student is expected to:
 - (A) generate creative ideas to solve problems by brainstorming possible solutions; and
 - (B) employ critical-thinking and interpersonal skills to resolve conflicts with individuals such as coworkers, customers, clients, and employers.
- (5) The student uses information technology tools specific to restaurant management to access, manage, integrate, and interpret information. The student is expected to:
 - (A) use information technology tools and applications to perform workplace responsibilities;

- (B) demonstrate knowledge and use of point-of-sale systems; and
 - (C) evaluate Internet resources for information.
- (6) The student understands roles within teams, work units, departments, organizations, and the larger environment of the food service industry. The student is expected to:
 - (A) explain the different types and functions of kitchen, front-of-the-house, and support roles;
 - (B) investigate quality-control standards and practices;
 - (C) differentiate between various styles of restaurant services such as table, buffet, fast food, fast casual, and quick service;
 - (D) illustrate various place settings using proper placement of dining utensils; and
 - (E) demonstrate the proper service techniques in food service operations.
- (7) The student understands the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. The student is expected to:
 - (A) assess workplace conditions with regard to safety and health;
 - (B) analyze potential effects caused by common chemicals and hazardous materials;
 - (C) demonstrate first aid and cardiopulmonary resuscitation skills;
 - (D) apply safety and sanitation standards common to the workplace;
 - (E) research sources of food-borne illness and determine ways to prevent them;
 - (F) determine professional attire and personal hygiene for restaurant employees; and
 - (G) prepare for a state or national food sanitation certification or other appropriate certifications.
- (8) The student uses leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives. The student is expected to:
 - (A) apply team-building skills;
 - (B) apply decision-making and problem-solving skills;
 - (C) determine leadership and teamwork qualities to aid in creating a pleasant working atmosphere; and
 - (D) participate in community leadership and teamwork opportunities to enhance professional skills.
- (9) The student knows and understands the importance of professional ethics and legal responsibilities within the food service industry. The student is expected to:
 - (A) demonstrate ethical reasoning in a variety of workplace situations in order to make decisions;
 - (B) interpret and explain written organizational policies and procedures to help employees perform their jobs; and
 - (C) develop guidelines for professional conduct.
- (10) The student demonstrates an understanding that personal success depends on personal effort. The student is expected to:
 - (A) demonstrate a proactive understanding of self-responsibility and self-management;
 - (B) identify behaviors needed to be employable and maintain employment such as positive work ethics and positive personal qualities;

- (C) identify and evaluate the effects of exercise, nutritional dietary habits, and emotional factors such as stress, fatigue, or anxiety on job performance;
 - (D) implement stress-management techniques; and
 - (E) follow directions and procedures independently.
- (11) The student develops principles in time management, decision making, effective communication, and prioritization. The student is expected to:
- (A) apply effective practices for managing time and energy;
 - (B) analyze various steps in the career decision-making process; and
 - (C) discuss the importance of balancing a career, family, and leisure activities.
- (12) The student knows and understands the importance of employability skills. The student is expected to:
- (A) demonstrate skills related to seeking employment in the food service industry;
 - (B) identify the required training and educational requirements that lead toward appropriate career goals;
 - (C) select educational and work history highlights to include in a career portfolio;
 - (D) create and update a personal career portfolio;
 - (E) recognize required employment forms and their functions such as I-9, work visa, W-4, and licensures to meet employment requirements;
 - (F) research the local and regional labor workforce market to determine opportunities for advancement;
 - (G) investigate professional development training opportunities to keep current on relevant trends and information within the industry; and
 - (H) recognize entrepreneurship opportunities.
- (13) The student understands the use of technical knowledge and skills required to pursue careers in the restaurant food service industry, including knowledge of design, operation, and maintenance of technological systems. The student is expected to:
- (A) define job-specific technical vocabulary;
 - (B) analyze customer comments to formulate improvements in services and products and training of staff;
 - (C) detail ways to achieve high rates of customer satisfaction;
 - (D) use different types of payment options to facilitate customer payments for services; and
 - (E) demonstrate technical skills used in producing quality food service.
- (14) The student understands factors that affect the food service industry. The student is expected to:
- (A) outline the history and growth of the food service industry;
 - (B) identify an entrepreneur who has made significant contributions to the food service industry; and
 - (C) explain cultural globalization and its influence on food.
- (15) The student evaluates and determines equipment, ingredients, and procedures in a professional food setting. The student is expected to:
- (A) identify the role of mise en place;
 - (B) identify and use large and small equipment in the professional food service setting;

- (C) identify the types of knives and proper usage in a commercial kitchen;
- (D) demonstrate proper knife safety, handling, cleaning, and storage;
- (E) differentiate between different types of produce and identify factors such as grading, purchasing, storage, and usage;
- (F) differentiate between dry goods and identify factors such as purchasing and storage;
- (G) differentiate between proteins and identify factors such as types, grades, purchasing, and storage;
- (H) describe the methods of cooking, including dry heat, moist heat, and combination heat; and
- (I) differentiate between common baking methods and identify common ingredients used in baking.

§130.254. Culinary Arts (Two Credits), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 10-12. Recommended prerequisites: Principles of Hospitality and Tourism and Introduction to Culinary Arts. Students shall be awarded two credits for successful completion of this course.
- (b) Introduction.
 - (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.
 - (3) Culinary Arts begins with the fundamentals and principles of the art of cooking and the science of baking and includes management and production skills and techniques. Students can pursue a national sanitation certification or other appropriate industry certifications. This course is offered as a laboratory-based course.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
 - (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) model effective oral and written communication;
 - (B) practice professional grooming and hygiene standards;
 - (C) exercise punctuality and time-management skills;
 - (D) demonstrate self-respect and respect for others;
 - (E) demonstrate effective team work and leadership; and
 - (F) employ initiative, adaptability, and problem-solving techniques in practical applications.
 - (2) The student applies advanced reading, writing, mathematics, and science skills for the food service industry. The student is expected to:
 - (A) compose industry appropriate documents such as purchasing specifications and purchase orders;

- (B) comprehend a variety of texts such as operations and training manuals;
 - (C) calculate numerical concepts such as percentages and estimations in practical situations, including weight and measures;
 - (D) understand scientific principles used in culinary arts;
 - (E) read and comprehend standardized recipes;
 - (F) write and convert standardized recipes; and
 - (G) calculate and manage food costs.
- (3) The student integrates listening, writing, and speaking skills using verbal and nonverbal communication to enhance operations, guest satisfaction, and professional development. The student is expected to:
- (A) create formal or informal presentations;
 - (B) properly answer business phones;
 - (C) write instructions for a specific restaurant for a culinary procedure or the use of a piece of equipment; and
 - (D) attend and participate in an industry-focused staff meeting.
- (4) The student demonstrates an understanding that personal success depends on personal effort. The student is expected to:
- (A) demonstrate a proactive understanding of self-responsibility and self-management;
 - (B) explain the characteristics of personal values and principles;
 - (C) demonstrate positive attitudes and work habits;
 - (D) demonstrate exemplary appearance and personal hygiene; and
 - (E) identify and manage the effects of exercise, dietary habits, and emotional factors such as stress, fatigue, or anxiety on job performance.
- (5) The student develops principles in time management, decision making, effective communication, and prioritization. The student is expected to:
- (A) apply effective practices for managing time and energy; and
 - (B) analyze various steps in the decision-making process.
- (6) The student researches, analyzes, and explores lifestyle and career goals. The student examines jobs available in the food service industry and accesses career opportunities. The student is expected to:
- (A) research the major job duties and qualifications for various positions in the food service industry to facilitate selection of career choices in culinary arts;
 - (B) update a personal career portfolio;
 - (C) demonstrate proper interview techniques; and
 - (D) establish personal short- and long-term goals.
- (7) The student understands factors that affect the food service industry. The student is expected to:
- (A) research how historical and current trends in society affect the food service industry;
 - (B) identify global cultures and traditions related to food;
 - (C) research famous chefs from history; and
 - (D) summarize historical entrepreneurs who influenced food service in the United States.

- (8) The student evaluates and determines equipment, ingredients, and procedures used in a professional food setting. The student is expected to:
- (A) identify and demonstrate the role of mise en place in the professional food service setting;
 - (B) identify and use large and small equipment in a commercial kitchen;
 - (C) develop and practice food production and presentation techniques;
 - (D) identify and use the appropriate application of moist, dry, and combination cookery methods;
 - (E) demonstrate the preparation skills of items commonly prepared in food service operations such as breakfast cookery, salads and dressings, soups and sandwiches, stocks and sauces, appetizers, seafood, poultry, meat, pastas and grains, and fruits and vegetables; and
 - (F) demonstrate baking techniques such as yeast breads and rolls, quick breads, and desserts.
- (9) The student understands the various food service operations such as quick service, fast casual, casual, fine dining, institutional, and beverage service. The student is expected to:
- (A) explain quality customer service;
 - (B) demonstrate types of table setting, dining, and service skills;
 - (C) differentiate between service styles; and
 - (D) compare and contrast the roles of the front of the house and the back of the house in the various food service operations.
- (10) The student uses technology and computer applications to manage food service operations. The student is expected to:
- (A) use technology tools appropriate for the industry;
 - (B) operate technology applications to perform workplace tasks;
 - (C) explain and use point-of-sale systems in various food service operations;
 - (D) demonstrate knowledge in computer programs used for food management;
 - (E) evaluate information sources for culinary arts; and
 - (F) interpret data such as spreadsheets, databases, and sales reports.
- (11) The student demonstrates leadership, citizenship, and teamwork skills required for success. The student is expected to:
- (A) apply team-building skills;
 - (B) apply decision-making and problem-solving skills;
 - (C) determine leadership and teamwork qualities in creating a pleasant working atmosphere; and
 - (D) participate in community leadership and teamwork opportunities to enhance professional skills.
- (12) The student explains how employees, guests, and property are protected to minimize losses or liabilities. The student is expected to:
- (A) determine the basics of safety in culinary arts;
 - (B) assess workplace conditions and identify safety hazards;
 - (C) determine the basics of sanitation in a professional kitchen;
 - (D) determine proper receiving, storage, and distribution techniques;

- (E) demonstrate proper cleaning of equipment and maintenance in the commercial kitchen;
 - (F) assess food hazards and determine ways to prevent food hazards; and
 - (G) prepare for a state or national food sanitation certification or other appropriate certifications.
- (13) The student recognizes and models work ethics and legal responsibilities. The student is expected to:
- (A) understand and comply with laws and regulations specific to the food service industry; and
 - (B) demonstrate a positive work ethic.

§130.255. Advanced Culinary Arts (Two Credits), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 10-12. Prerequisite: Culinary Arts. Students shall be awarded two credits for successful completion of this course.
- (b) Introduction.
- (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.
 - (3) Advanced Culinary Arts will extend content and enhance skills introduced in Culinary Arts by in-depth instruction of industry-driven standards in order to prepare students for success in higher education, certifications, and/or immediate employment.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) model effective oral and written communication;
 - (B) practice professional grooming and hygiene standards;
 - (C) exercise punctuality and time-management skills;
 - (D) demonstrate self-respect and respect for others;
 - (E) demonstrate effective team work and leadership; and
 - (F) employ initiative, adaptability, and problem-solving techniques in practical applications.
 - (2) The student researches, analyzes, and designs a path to achieve career goals. The student examines jobs available in the food service industry and accesses career opportunities. The student is expected to:
 - (A) demonstrate major duties and qualifications for all staff and managerial positions to facilitate selection of career choices in the food service industry;
 - (B) model proper interview techniques;
 - (C) critique personal and short-term goals; and

- (D) create and update a career portfolio.
- (3) The student explains how employees, guests, and property are protected to minimize losses or liabilities. The student is expected to:
- (A) determine the basics of safety in culinary arts;
 - (B) assess workplace conditions and identify safety hazards;
 - (C) determine the basics of sanitation in a professional kitchen;
 - (D) determine proper receiving, storage, and distribution techniques;
 - (E) explain and demonstrate proper cleaning of equipment and maintenance of the commercial kitchen;
 - (F) assess food hazards and determine ways to prevent food hazards; and
 - (G) prepare for a state or national food sanitation certification or other appropriate certifications.
- (4) The student evaluates global cuisines, including the culture, history, and indigenous ingredients to create international recipes. The student is expected to:
- (A) replicate advanced moist and dry cooking techniques from global cuisines such as American regional, Latin American, European, Mediterranean, Middle Eastern, and Asian;
 - (B) synthesize indigenous ingredients from global cuisine to create innovative dishes; and
 - (C) justify the connection of flavor, texture, visual appeal, taste, and customer satisfaction on product development.
- (5) The student demonstrates an understanding of sustainability in the restaurant industry and its local and global effect. The student is expected to:
- (A) evaluate practices for water and energy conservation across the food service industry;
 - (B) identify waste management options to promote sustainability; and
 - (C) evaluate current sustainable food practices.
- (6) The student demonstrates comprehensive protein product knowledge as it relates to flavor, texture, visual appeal, taste, and customer satisfaction and establishes quality standards. The student is expected to:
- (A) assess grading and classifications;
 - (B) identify primal, sub-primal, and retail cuts;
 - (C) demonstrate fabrication techniques on proteins;
 - (D) evaluate purchasing practices according to various food service operations;
 - (E) model appropriate cooking methods for proteins; and
 - (F) evaluate appropriate cooking methods in regard to various protein selections.
- (7) The student demonstrates comprehensive fish and shellfish product knowledge as it relates to flavor, texture, visual appeal, taste, and customer satisfaction and establishes quality standards. The student is expected to:
- (A) categorize classifications of fish and shellfish;
 - (B) evaluate factors that influence seafood purchasing such as freshness, flavor, sustainability, and market conditions;
 - (C) demonstrate the ability to clean and fabricate round, flat, fin fish, and shellfish;

- (D) model appropriate cooking methods for fish and shellfish; and
- (E) evaluate the effects of cooking methods on product presentation.
- (8) The student demonstrates comprehensive knowledge of fruits, vegetables, grains, herbs, spices, and other dry goods as related to presentation, flavor, texture, visual appeal, taste, and customer satisfaction and establishes quality standards. The student is expected to:
 - (A) compare types of commonly available produce;
 - (B) identify factors contributing to cost and quality such as seasonality, market volatility, and transportation;
 - (C) compare and contrast forms and use of produce such as fresh, frozen, canned, dried, and other classifications;
 - (D) model appropriate cooking methods for produce; and
 - (E) evaluate the effects of cooking methods on produce.
- (9) The student understands advanced baking and pastry principles. The student is expected to:
 - (A) use professional food preparation equipment such as commercial-grade mixers, food processors, and measuring tools;
 - (B) apply proper measuring and scaling techniques; and
 - (C) compose various plated desserts appropriate for various food service operations.
- (10) The student demonstrates and practices the basic procedures for the production of yeast and quick bread products. The student is expected to:
 - (A) differentiate how various types of bread crusts are created through fermentation, proofing, baking temperatures, and humidity;
 - (B) prepare soft, hard, and artisanal breads through proper baking techniques; and
 - (C) differentiate between quick breads such as muffins, scones, and biscuits.
- (11) The student demonstrates and practices the basic procedures for the production of pastry crust, pastry dough, and cookie. The student is expected to:
 - (A) compare different types of pastry crusts and usage in pies and tarts;
 - (B) prepare pie fillings such as fruit, soft, and custard fillings;
 - (C) prepare different types of pastry dough such as Pate a Choux, Pate Sucrie, and laminated dough;
 - (D) differentiate between various cookie preparation methods;
 - (E) determine the causes of crispness, moistness, chewiness, and the spread of cookies; and
 - (F) bake, cook, and store cookies properly.
- (12) The student demonstrates and practices the basic procedures for the production of cakes, frostings, fillings, and icings. The student is expected to:
 - (A) differentiate between cake preparation methods;
 - (B) differentiate the functions of icings and determine appropriate application;
 - (C) assemble and ice simple layer cakes, sheet cakes, and cupcakes;
 - (D) demonstrate the ability to identify criteria for evaluation of cake products;
 - (E) prepare various icings such as fondant, buttercreams, flat, royal, and glazes; and
 - (F) perform basic piping skills with a parchment cone and pastry bag with tips.

- (13) The student demonstrates and practices the basic procedures for the production of custards, creams, and mousse. The student is expected to:
- (A) compose desserts such as ice creams, custards, mousse, and other desserts; and
 - (B) identify the roles of desserts such as ice creams, custards, mousse, and other desserts.
- (14) The student demonstrates and practices the basic procedures for the production of chocolate, sugars, confections, and sauces. The student is expected to:
- (A) differentiate between the types of advanced confections;
 - (B) model methods of preparation in each type of confection;
 - (C) use chocolate as a major ingredient in dessert or food production;
 - (D) temper chocolate;
 - (E) use tempered chocolate in dessert preparation;
 - (F) cook sugar syrups to various stages of hardness;
 - (G) prepare dessert sauces such as custard, chocolate, caramel, fruit fillings, and coulis; and
 - (H) serve attractively plated desserts with appropriate sauces and garnishes.
- (15) The student evaluates nutrition concepts as they affect health and wellness, marketing, and menu planning. The student is expected to:
- (A) analyze the role of carbohydrates, vitamins, minerals, proteins, and fats as they relate to food choices; and
 - (B) research and develop menus for populations with dietary requirements or restrictions.
- (16) The student analyzes the components of cost controls in a food service operation and develops a plan to manage cost. The student is expected to:
- (A) differentiate between the major costs in food service such as food, beverage, and labor costs;
 - (B) validate the effect of controlling costs on the success of a food service operation;
 - (C) compare and contrast the concept of fixed costs, variable costs, and controllable costs; and
 - (D) compare and contrast the relationship between inventory management and cost control in food service operations.

§130.256. Food Chemistry (One Credit), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: three units of science, including chemistry and biology. Recommended prerequisite: Principles of Hospitality and Tourism. To receive credit in science, students must meet the 40% laboratory and fieldwork requirement identified in §74.3(b)(2)(C) of this title (relating to Description of a Required Secondary Curriculum). This course satisfies a high school science graduation requirement, including the fourth science credit. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
- (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.

- (3) In Food Chemistry students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Food Science is the study of the nature of foods, the causes of deterioration, the principles underlying food processing, and the improvement of foods for the consuming public.
 - (4) Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.
 - (5) Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation are experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.
 - (6) Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information).
 - (7) A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.
 - (8) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (9) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) apply interpersonal communication skills in business and industry settings;
 - (B) explain and recognize the value of collaboration within the workplace;
 - (C) examine the importance of time management to succeed in the workforce;
 - (D) identify work ethics/professionalism in a job setting; and
 - (E) develop problem-solving and critical-thinking skills.
 - (2) The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
 - (A) demonstrate safe practices during laboratory and field investigations; and
 - (B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.
 - (3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:
 - (A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section;
 - (B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a wide variety of conditions are incorporated into theories;

- (C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed;
 - (D) distinguish between scientific hypotheses and scientific theories;
 - (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;
 - (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures;
 - (G) analyze, evaluate, make inferences, and predict trends from data; and
 - (H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.
- (4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:
- (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;
 - (C) draw inferences based on data related to promotional materials for products and services;
 - (D) evaluate the impact of scientific research on society and the environment;
 - (E) evaluate models according to their limitations in representing biological objects or events; and
 - (F) research and describe the history of biology and contributions of scientists.
- (5) The student analyzes the role of acids and bases in the food sciences. The student is expected to:
- (A) evaluate physical and chemical properties of acids and bases; and
 - (B) analyze the relationship of pH to the properties, safety, and freshness of food.
- (6) The student evaluates the principles of microbiology and food safety practices. The student is expected to:
- (A) investigate the properties of microorganisms that cause food spoilage;
 - (B) compare food intoxication and food infection;
 - (C) examine methods to destroy or inactivate harmful pathogens in foods;
 - (D) compare beneficial and harmful organisms;
 - (E) analyze sanitary food-handling practices; and
 - (F) prepare for a state or national food manager's sanitation certification or alternative credential within the field of food science technology.

- (7) The student examines the chemical properties of food. The student is expected to:
- (A) describe elements, compounds, mixtures, and formulas related to food science;
 - (B) compare heterogeneous and homogeneous mixtures;
 - (C) use chemical symbols, formulas, and equations in food science; and
 - (D) analyze chemical and physical changes in food.
- (8) The student analyzes solutions, colloids, solids, gels, foams, and emulsions in food science. The student is expected to:
- (A) identify the solvent and solute in a given solution;
 - (B) compare unsaturated, saturated, and supersaturated solutions, including boiling and freezing points;
 - (C) calculate the concentration of a solution using mass percent;
 - (D) describe the properties of colloidal dispersions;
 - (E) investigate the relationship of the three parts of an emulsion; and
 - (F) create various food emulsions.
- (9) The student analyzes the functions of enzymes in food science. The student is expected to:
- (A) describe the role of enzymes as catalysts in chemical reactions of food;
 - (B) explain the relationship between an enzyme and a substrate;
 - (C) analyze the functions of enzymes in digestion; and
 - (D) analyze enzyme reactions in food preparation.
- (10) The student evaluates the role of fermentation in food science. The student is expected to:
- (A) analyze reasons food is fermented;
 - (B) assess the role of bacteria in food fermentation;
 - (C) conduct laboratory experiments with various fermentation processes using the scientific processes; and
 - (D) prepare various fermented food products.
- (11) The student assesses the reaction of leavening agents in baked products. The student is expected to:
- (A) identify various leavening agents and describe their role in baked products;
 - (B) analyze the role of acids as leavening agents in baked products;
 - (C) compare doughs and batters used in baked products;
 - (D) conduct laboratory experiments with various leavening agents using the scientific processes; and
 - (E) create baked products using various leavening agents.
- (12) The student explores the roles of food additives. The student is expected to:
- (A) evaluate the various types of food additives such as incidental, intentional, natural, and artificial;
 - (B) investigate the various roles of food additives such as food preservation, nutritive value, and sensory characteristics;
 - (C) research agencies involved in regulating food additives; and

- (D) conduct laboratory experiments using the scientific processes to compare sensory characteristics of additives in food products.
- (13) The student analyzes the processes of energy production in food. The student is expected to:
- (A) discuss molecular motion and temperature;
 - (B) examine heat transfer processes such as conduction, convection, and radiation;
 - (C) investigate phase changes in food production such as latent heat, crystallization, and condensation;
 - (D) analyze rates of reaction using various temperatures;
 - (E) conduct laboratory experiments using the scientific processes to compare phase changes in food production; and
 - (F) conduct laboratory experiments using the scientific processes to compare rates of reaction using various temperatures.
- (14) The student evaluates the properties of carbohydrates and their effects on food production. The student is expected to:
- (A) discuss photosynthesis;
 - (B) identify the chemical structures of carbohydrates;
 - (C) describe the functions of carbohydrates in food production such as a caramelizing agent, crystallizing agent, and thickening agent;
 - (D) compare the structures of simple and complex carbohydrates and how these structures affect food production;
 - (E) describe various process such as gelatinization, retrogradation, and syneresis in food production;
 - (F) conduct laboratory experiments using the scientific processes to explore the functions of carbohydrates in food production; and
 - (G) create food products using simple and/or complex carbohydrates.
- (15) The student evaluates the properties of fats and their effects on food production. The student is expected to:
- (A) identify the chemical structure of saturated and unsaturated fats;
 - (B) compare the properties of saturated and unsaturated fats;
 - (C) examine the functions of fats in food production;
 - (D) explore methods for controlling fat oxidation;
 - (E) analyze the effects of temperature on fats in food preparation;
 - (F) conduct laboratory experiments using the scientific processes to explore the functions of fats in food production; and
 - (G) create food products using saturated and unsaturated fats.
- (16) The student evaluates the properties of proteins and amino acids and their effects on food production. The student is expected to:
- (A) identify the elements of an amino acid;
 - (B) describe the chemical structure of various amino acids;
 - (C) explain the processes of protein denaturation and coagulation;

- (D) examine the functions of proteins in food productions such as emulsifiers, foams, and gluten formation;
 - (E) analyze the effect of temperature on protein in food production and storage;
 - (F) explore moist and dry heat methods for preparing protein rich foods;
 - (G) conduct laboratory experiments using the scientific processes to explore the functions of protein in food production; and
 - (H) create food products using protein.
- (17) The student evaluates the properties of vitamins and minerals and their effects on food production. The student is expected to:
- (A) discuss the functions of vitamins and minerals in food production;
 - (B) compare the effects of food production on water- and fat-soluble vitamins;
 - (C) assess the interrelationships among vitamins and minerals in food production; and
 - (D) conduct laboratory experiments using the scientific processes to explore the effects of food production on soluble vitamins and minerals.
- (18) The student evaluates the properties of water and their effects on food production. The student is expected to:
- (A) identify the properties of water;
 - (B) compare the effects of hard and soft water on food production;
 - (C) analyze the phases of water and their effects on food production;
 - (D) explain the functions of water in food production such as a heat medium and a solvent;
 - (E) conduct laboratory experiments using the scientific processes to explore the functions of water in food productions; and
 - (F) create food products using water as a heat medium or a solvent.
- (19) The student analyzes processes that destroy bacteria during food production. The student is expected to:
- (A) examine the food irradiation process; and
 - (B) investigate the pasteurization process.
- (20) The student examines packaging and labeling guidelines. The student is expected to:
- (A) research federal food packaging guidelines;
 - (B) analyze components of appropriate commercial food containers;
 - (C) describe controlled-atmosphere packaging; and
 - (D) investigate information required on a food label.
- (21) The student analyzes food preservation processes. The student is expected to:
- (A) describe reasons for food preservation;
 - (B) compare methods of dehydration;
 - (C) analyze various methods of personal and commercial food canning;
 - (D) examine the various methods of personal and commercial food freezing;
 - (E) investigate safe practices for personal and commercial food preservation;
 - (F) conduct laboratory experiments using the scientific processes to demonstrate food preservation processes; and

(G) create food products using food preservation processes.

§130.257. Practicum in Culinary Arts (Two to Three Credits), Adopted 2015.

(a) General requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Culinary Arts.

(1) A student shall be awarded two credits for successful completion of this course when the student participates in at least an average of 10 hours, but less than 15 hours, per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Hospitality and Tourism Career Cluster.

(2) A student shall be awarded three credits for successful completion of this course when the student participates in an average of 15 hours per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Hospitality and Tourism Career Cluster.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

(2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.

(3) Practicum in Culinary Arts is a unique practicum that provides occupationally specific opportunities for students to participate in a learning experience that combines classroom instruction with actual business and industry career experiences. Practicum in Culinary Arts integrates academic and career and technical education; provides more interdisciplinary instruction; and supports strong partnerships among schools, businesses, and community institutions with the goal of preparing students with a variety of skills in a fast-changing workplace.

(4) Students are taught employability skills to prepare for college and career success, which include job-specific skills applicable to their training plan, job interview techniques, communication skills, financial and budget activities, human relations, and portfolio development.

(5) Instructions may be delivered through school-based laboratory training or through work-based delivery arrangement such as cooperative education, mentoring, and job shadowing.

(6) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

(7) In accordance with §74.26(b) of this title (relating to Award of Credit), a course must be considered completed and credit must be awarded if the student has demonstrated achievement by meeting the standard requirements of the course, including demonstrated proficiency in the subject matter, regardless of the time the student has received instruction in the course or the grade level at which proficiency was attained.

(8) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:

(A) model effective oral and written communication;

(B) practice professional grooming and hygiene standards;

(C) exercise punctuality and time-management skills;

- (D) demonstrate self-respect and respect for others;
 - (E) demonstrate effective team work and leadership; and
 - (F) employ initiative, adaptability, and problem-solving techniques in practical applications.
- (2) The student uses employability skills to gain an entry-level job in a high-skill, high-wage, or high-demand field. The student is expected to:
- (A) identify employment opportunities;
 - (B) demonstrate the application of essential workplace skills in the career acquisition process;
 - (C) complete employment-related documents such as job applications, I-9 and W-4 forms, and job descriptions; and
 - (D) demonstrate proper interview techniques in various situations.
- (3) The student develops skills for success in the workplace. The student is expected to:
- (A) comprehend and model appropriate grooming and appearance for the workplace;
 - (B) demonstrate dependability, punctuality, and initiative;
 - (C) develop positive interpersonal skills, including respect for diversity;
 - (D) demonstrate appropriate business and personal etiquette in the workplace;
 - (E) exhibit productive work habits, ethical practices, and a positive attitude;
 - (F) demonstrate knowledge of personal and occupational health and safety practices in the workplace;
 - (G) demonstrate the ability to work with the other employees to support the organization and complete assigned tasks;
 - (H) prioritize work to fulfill responsibilities and meet deadlines;
 - (I) evaluate the relationship of good physical and mental health to job success and personal achievement;
 - (J) demonstrate effective verbal, non-verbal, written, and electronic communication skills; and
 - (K) apply effective listening skills used in the workplace.
- (4) The student demonstrates work ethics, employer expectations, interaction with diverse populations, and communication skills in the workplace. The student is expected to:
- (A) relate how personal integrity affects human relations on the job;
 - (B) demonstrate characteristics of successful working relationships such as teamwork, conflict resolution, self-control, and the ability to accept criticism;
 - (C) implement employer expectations;
 - (D) demonstrate respect for the rights of others;
 - (E) demonstrate ethical standards; and
 - (F) comply with organizational policies.
- (5) The student applies academics and job-readiness skills. The student is expected to:
- (A) apply mathematical skills to business transactions;
 - (B) develop a personal budget based on career choice;
 - (C) interpret data from documents such as tables, charts, and graphs to estimate and find solutions to problems; and

- (D) organize and compose workplace documents.
- (6) The student applies ethical behavior standards and legal responsibilities within the workplace. The student is expected to:
 - (A) compare workplace policies reflecting various business establishments;
 - (B) apply responsible and ethical behavior;
 - (C) summarize provisions of the Fair Labor Standards Act;
 - (D) describe the consequences of breach of confidentiality; and
 - (E) research and model laws related to culinary arts professions.
- (7) The student applies the use of interpersonal skills to accomplish objectives. The student is expected to:
 - (A) identify and practice effective interpersonal and team-building skills involving situations with coworkers, managers, and customers; and
 - (B) apply leadership and career development skills through participation in activities such as career and technical student organizations.
- (8) The student uses concepts and skills related to safety in the workplace. The student is expected to:
 - (A) identify and apply safe working practices;
 - (B) solve problems related to unsafe work practices and attitudes;
 - (C) explain Occupational Safety and Health Administration regulations in the workplace;
 - (D) analyze health and wellness practices that influence job performance; and
 - (E) prepare for a state or national food sanitation certification or other appropriate certification.
- (9) The student evaluates personal attitudes and work habits that support career retention and advancement. The student is expected to:
 - (A) analyze the future employment outlook in the occupational area;
 - (B) describe entrepreneurial opportunities in the area of culinary arts;
 - (C) evaluate nontraditional food service careers such as food photographer, food stylist, corporate research and development chef, food writer, and independent consultant;
 - (D) identify all of the aspects of a specific career path, including salary, skills level, and advancement opportunities;
 - (E) evaluate strategies for career retention and advancement in response to the changing hospitality industry;
 - (F) compare and contrast the rights and responsibilities of employers and employees; and
 - (G) determine effective money management and financial planning techniques.
- (10) The student identifies skills and attributes necessary for professional advancement. The student is expected to:
 - (A) evaluate employment options, including salaries and benefits;
 - (B) determine factors that affect career choices such as personal interests, abilities, priorities, and family responsibilities;
 - (C) determine continuing education opportunities that enhance career advancement and promote lifelong learning; and
 - (D) demonstrate effective methods to secure, maintain, and terminate employment.

- (11) The student demonstrates proper culinary techniques and knowledge of the professional kitchen. The student is expected to:
- (A) use large and small equipment in a commercial kitchen;
 - (B) develop food production and presentation techniques;
 - (C) demonstrate moist, dry, and combination cookery methods;
 - (D) demonstrate food preparation skills used in commercial food service preparations such as breakfast cookery, salads and dressings, soups and sandwiches, stocks and sauces, appetizers, seafood, poultry cookery, meat cookery, pastas and grains, and fruits and vegetables;
 - (E) demonstrate baking techniques such as yeast breads and rolls, quick breads, and desserts;
 - (F) demonstrate proper receiving and storage techniques;
 - (G) demonstrate proper cleaning of equipment and maintenance of the commercial kitchen; and
 - (H) compare and contrast the pairing of cuisine and service styles in food service operations.
- (12) The student determines how successful marketing impacts a food service operation. The student is expected to:
- (A) explain marketing, product, service, presentation, and communication mixes;
 - (B) generate a marketing plan for multiple food service operations;
 - (C) evaluate the marketing plans based on various demographics;
 - (D) conduct market analysis and predict impact in current economy;
 - (E) identity marketing communication formats across multiple platforms; and
 - (F) design the menu as a marketing tool.
- (13) The student documents technical knowledge and skills. The student is expected to:
- (A) complete a professional career portfolio to include items such as an updated resume, documentation of technical skill competencies, licensures or certifications, recognitions, awards and scholarships, community service hours, participation in student and professional organizations, abstract of key points of the practicum, and practicum supervisor evaluations; and
 - (B) present the professional career portfolio to interested stakeholders.

§130.258. Travel and Tourism Management (One Credit), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Hospitality and Tourism. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
- (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events and travel-related services.
 - (3) Travel and Tourism Management incorporates management principles and procedures of the travel and tourism industry as well as destination geography, airlines, international travel, cruising, travel

by rail, lodging, recreation, amusements, attractions, and resorts. Employment qualifications and opportunities are also included in this course.

- (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
- (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) formulate and organize oral and written information;
 - (B) compose a variety of written documents used in travel and tourism such as itineraries, thank you letters, presentations, and advertisements;
 - (C) differentiate and deliver different types of presentations such as informative, instructional, persuasive, and decision making;
 - (D) calculate basic math and percentages;
 - (E) investigate geography and factors that affect the travel and tourism industry; and
 - (F) summarize how to use the state of the economy to plan products and services.
- (2) The student uses oral and written communication skills in creating, expressing, and interpreting information and ideas, including technical terminology and information. The student is expected to:
 - (A) select and employ verbal skills when obtaining and conveying information;
 - (B) use verbal and nonverbal communication skills effectively with diverse constituents; and
 - (C) develop and deliver presentations using appropriate technology such as to engage, inform, and persuade audiences.
- (3) The student solves problems independently and in teams using critical-thinking skills. The student is expected to:
 - (A) generate creative ideas by brainstorming possible solutions;
 - (B) guide individuals through the process of making informed travel decisions;
 - (C) interpret and use industry standards for principles of budgeting and forecasting to maximize profit and growth; and
 - (D) analyze customer comments to formulate improvements in services and products.
- (4) The student uses information technology tools specific to the travel and tourism industry to access, manage, integrate, and create information. The student is expected to:
 - (A) operate and use technological applications to communicate within a workplace and perform a task;
 - (B) distinguish among the different modes of travel such as airline, cruise line, road travel, and rail;
 - (C) differentiate among recreation such as amusement, attractions, and resort venues;
 - (D) research travel arrangement systems used for booking reservations; and
 - (E) create basic multimedia publications.

- (5) The student understands roles within teams, work units, departments, organizations, inter-organization systems, and the larger environment of the travel and tourism industry. The student is expected to:
- (A) explain the functions and interactions of various departments within a travel and tourism business;
 - (B) research quality-control systems and practices;
 - (C) develop plans to accomplish organizational goals; and
 - (D) formulate collaborative plans with other related industries such as lodging, food and beverage service, and transportation agencies to provide an all-inclusive product for the customer.
- (6) The student understands the importance of health, safety, and environmental systems in the travel and tourism industry and their importance to organizational performance and regulatory compliance. The student is expected to:
- (A) identify hazards common to workplaces such as safety, health, and environmental hazards;
 - (B) use industry standards to implement safety precautions to maintain a safe worksite;
 - (C) research and relate first aid and cardiopulmonary resuscitation skills;
 - (D) describe environmental procedures that ensure a facility is in compliance with health codes;
 - (E) describe how to train others for emergency situations;
 - (F) analyze potential effects caused by common chemicals and hazardous materials; and
 - (G) compare and contrast security measures to protect the guests, staff, and property.
- (7) The student uses leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives. The student is expected to:
- (A) apply team-building skills;
 - (B) apply decision-making and problem-solving skills;
 - (C) apply teamwork qualities in creating a pleasant work environment;
 - (D) determine the impact of cultural diversity on teamwork; and
 - (E) participate in community service opportunities.
- (8) The student knows and understands the importance of professional ethics and legal responsibilities. The student is expected to:
- (A) discuss ethical reasoning to a variety of workplace situations in order to make decisions; and
 - (B) research information on organizational policies in handbooks and manuals.
- (9) The student knows and understands the importance of employability skills and is able to explore and effectively plan for managing travel and tourism careers. The student is expected to:
- (A) identify and demonstrate behaviors and skills necessary to be employable;
 - (B) identify the training and education requirements that lead toward an appropriate certification for employment;
 - (C) demonstrate proper interview techniques;
 - (D) update or create a career portfolio;
 - (E) investigate continuing education opportunities within the industry;

- (F) examine appropriate credentialing requirements to maintain compliance with industry requirements;
 - (G) compare and contrast the effect of stress, fatigue, and anxiety on job performance;
 - (H) complete required employment forms such as I-9, work visa, W-4, and licensures to meet employment requirements; and
 - (I) explore entrepreneurship opportunities within the travel and tourism industry.
- (10) The student develops principles in time management, decision making, effective communication, and prioritizing. The student is expected to:
- (A) apply effective practices for time management;
 - (B) analyze various steps in the decision-making process for prioritizing effectively; and
 - (C) discuss the importance of balancing a career, a family, and leisure activities.
- (11) The student uses technical knowledge and skills required in the travel and tourism industry. The student is expected to:
- (A) develop job-specific technical vocabulary;
 - (B) use marketing techniques to sell products and services;
 - (C) evaluate current and emerging technologies to improve guest services;
 - (D) explain different types of payment options;
 - (E) analyze customer service concepts and scenarios;
 - (F) describe how customer service affects a company's bottom line;
 - (G) develop an awareness of cultural diversity to enhance travel planning such as differences in social etiquette, dress, and behaviors;
 - (H) demonstrate an understanding of tourism sales and the impact on distribution systems; and
 - (I) demonstrate knowledge of destination, attraction planning, and development, including the use of organizations such as convention and visitor's bureaus and state tourist boards.

§130.259. Hotel Management (One Credit), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Hospitality and Tourism. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
 - (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.
 - (3) Hotel Management focuses on the knowledge and skills needed to pursue staff and management positions available in the hotel industry. This in-depth study of the lodging industry includes departments within a hotel such as front desk, food and beverage, housekeeping, maintenance, human resources, and accounting. This course will focus on, but not be limited to, professional communication, leadership, management, human resources, technology, and accounting.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

- (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
- (A) organize oral and written information;
 - (B) compose and present individually and in teams a variety of written documents such as agendas, thank you letters, presentations, and advertisements;
 - (C) calculate correctly using numerical concepts such as percentage and estimation in practical situations; and
 - (D) examine and apply how scientific principles are used in the hotel industry.
- (2) The student uses verbal and nonverbal communication skills to create, express, and interpret information for providing a positive experience for guests and employees. The student is expected to:
- (A) develop, deliver, and critique presentations;
 - (B) analyze various marketing strategies for a lodging property and available services;
 - (C) demonstrate proper techniques for using telecommunications equipment;
 - (D) interpret verbal and nonverbal cues to enhance communication with individuals such as coworkers, guests, and clients;
 - (E) locate written information used to communicate with individuals such as coworkers and guests;
 - (F) apply and model active listening skills to obtain and clarify information; and
 - (G) follow directions and procedures independently and in teams.
- (3) The student solves problems independently and in teams using critical thinking, innovation, and creativity. The student is expected to:
- (A) generate creative ideas to solve problems by brainstorming possible solutions;
 - (B) employ critical-thinking and interpersonal skills to resolve conflicts with individuals such as coworkers, employers, guests, and clients; and
 - (C) interpret and use industry standards for principles of budgeting and forecasting to maximize profit and growth.
- (4) The student demonstrates an understanding that personal success depends on personal effort. The student is expected to:
- (A) demonstrate an understanding of self-responsibility and self-management;
 - (B) identify and demonstrate both positive and negative work behaviors and personal qualities for employability; and
 - (C) evaluate the effects of health and wellness on employee performance.
- (5) The student develops principles in time management, decision making, effective communication, and prioritization. The student is expected to:
- (A) apply effective practices for managing time and energy;
 - (B) develop and implement stress-management techniques;
 - (C) assemble and analyze the various steps in the decision-making process; and

- (D) evaluate the importance of balancing a career, family, and leisure activities and develop various techniques to reduce conflict.
- (6) The student understands the importance of employability skills. The student is expected to:
- (A) assemble the required training or education requirements that lead to an appropriate industry certification;
 - (B) comprehend and model skills related to seeking employment;
 - (C) assemble and/or update an electronic personal career portfolio;
 - (D) complete a job application in written and electronic format;
 - (E) examine and model proper interview techniques in applying for employment;
 - (F) complete required employment forms such as I-9, work visa, W-4, and licensures to meet employment requirements;
 - (G) research the local labor workforce market to determine opportunities for lodging employment;
 - (H) investigate professional lodging organizations and development training opportunities to keep current on relevant trends and information within the lodging industry; and
 - (I) create, design, and present lodging entrepreneurship opportunities.
- (7) The student understands roles within teams, work units, departments, organizations, and the larger environment of the lodging industry. The student is expected to:
- (A) identify lodging departments and distinguish among the duties and responsibilities within each department;
 - (B) implement quality-control standards and practices;
 - (C) compare and contract duties and responsibilities from each department to the larger lodging environment, including food and beverage services;
 - (D) identify, compare, and contrast all types of lodging properties;
 - (E) compare and contrast lodging revenue and support centers;
 - (F) compare and contrast chain and franchise lodging properties;
 - (G) create, design, and present lodging entrepreneurship opportunities; and
 - (H) comprehend and model professional attire.
- (8) The student uses information technology tools specific to lodging management to access, manage, integrate, and create information. The student is expected to:
- (A) use information technology tools to evaluate lodging work responsibilities;
 - (B) evaluate technology tools to perform workplace tasks;
 - (C) understand and evaluate the hotel/guest cycle with applicable technology;
 - (D) prepare and present complex multimedia publications;
 - (E) demonstrate knowledge and use of point-of-sale systems;
 - (F) evaluate Internet resources for industry information; and
 - (G) evaluate current and emerging technologies to improve guest services.
- (9) The student uses leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives. The student is expected to:
- (A) differentiate types of effective leadership and management styles and select which management style is effective for the lodging industry;

- (B) apply team-building skills;
 - (C) apply decision-making and problem-solving skills;
 - (D) apply leadership and teamwork qualities in creating a pleasant working atmosphere; and
 - (E) participate in community leadership and teamwork opportunities to enhance professional skills.
- (10) The student understands the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. The student is expected to:
- (A) assess workplace conditions with regard to safety and health;
 - (B) apply safety and sanitation standards common to the workplace;
 - (C) analyze potential effects caused by common chemical and hazardous materials;
 - (D) demonstrate first aid and cardiopulmonary resuscitation skills;
 - (E) research sources of food-borne illness and determine ways to prevent them; and
 - (F) evaluate the need for personal hygiene and correlate this to the importance of health, safety, and environmental management systems in the organization.
- (11) The student knows and understands the importance of professional ethics and legal responsibilities within the lodging industry. The student is expected to:
- (A) demonstrate professional and ethical standards;
 - (B) compare and contrast the rights of the innkeeper and the rights of the guest; and
 - (C) interpret and explain written organizational policies and procedures to help employees perform their jobs.
- (12) The student understands the knowledge and skills required for careers in the lodging industry. The student is expected to:
- (A) develop job-specific technical vocabulary;
 - (B) explain procedures to meet guest needs, including guest registration, rate assignment, room assignment, and determination of payment methods;
 - (C) differentiate the functions of meeting and event planning as it correlates to the individual lodging property; and
 - (D) understand the importance of check-out procedures to ensure guest satisfaction and verify settlement of account.

§130.260. Hospitality Services (Two Credits), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 11 and 12. Recommended prerequisites: Principles of Hospitality and Tourism, Hotel Management, and Travel and Tourism Management. Students shall be awarded two credits for successful completion of this course.
- (b) Introduction.
- (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.

- (3) Hospitality Services provides students with the academic and technical preparation to pursue high-demand and high-skill careers in hospitality related industries. The knowledge and skills are acquired within a sequential, standards-based program that integrates hands-on and project-based instruction. Standards included in the Hospitality Services course are designed to prepare students for nationally recognized industry certifications, postsecondary education, and entry-level careers. In addition, Hospitality Services is designed so that performance standards meet employer expectations, enhancing the employability of students. Instruction may be delivered through laboratory training or through internships, mentoring, or job shadowing.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) apply advanced reading, writing, and mathematical skills necessary in the hospitality industry; and
 - (B) understand and develop marketing techniques.
 - (2) The student uses communication skills in the creation, expression, and interpretation of information and ideas. The student is expected to:
 - (A) interpret communication such as verbal and non-verbal;
 - (B) recognize and respond to guest needs;
 - (C) develop listening skills to accurately process messages for guests;
 - (D) exhibit public relations skills; and
 - (E) recognize alternate communication services to assist customers with specialized needs.
 - (3) The student researches career opportunities and qualifications to broaden awareness of careers available in the hospitality industry. The student is expected to:
 - (A) outline a plan for an effective job search, including developing a resume;
 - (B) demonstrate flexibility to learn new knowledge and skills;
 - (C) prioritize work responsibilities and life responsibilities;
 - (D) develop an electronic career portfolio;
 - (E) compare and contrast personal strengths and weaknesses that may determine individual potential for growth within the hospitality industry;
 - (F) explain what is needed to achieve job advancement;
 - (G) understand the role of professional organizations or industry associations;
 - (H) research the procedures for licensure, certification, or credentials for a chosen occupation;
 - (I) analyze future employment outlooks;
 - (J) demonstrate appropriate business and personal etiquette;
 - (K) develop a written organizational policy to ensure successful hospitality operations such as guest satisfaction and employee success; and
 - (L) research the major duties and qualifications for hospitality managerial positions.

- (4) The student reviews ethical and legal responsibilities or related conduct toward guests and employees within the establishment to maintain high industry standards. The student is expected to:
- (A) examine laws regarding hiring, harassment, and safety issues;
 - (B) compare and contrast legal responsibilities and employer policies; and
 - (C) discuss ethical dilemmas.
- (5) The student uses information technology tools specific to hospitality service careers to access, manage, integrate, or create information. The student is expected to:
- (A) examine types of technology used to manage hospitality service operations;
 - (B) research website information on hospitality service operations; and
 - (C) evaluate current and emerging technologies provided by the hospitality industry.
- (6) The student applies leadership, teamwork, and critical-thinking skills in collaboration with others to accomplish organizational goals or objectives. The student is expected to:
- (A) demonstrate qualities that contribute to employee retention;
 - (B) formulate staff training plans to create an effective working team;
 - (C) evaluate methods of conflict-management skills to facilitate appropriate solutions;
 - (D) resolve unexpected situations in customer service;
 - (E) understand diverse employee cultures and customs; and
 - (F) value cultural diversity of guests.
- (7) The student applies marketing strategies independently and in teams. The student is expected to:
- (A) select and assemble effective marketing strategies;
 - (B) develop promotional packages;
 - (C) devise strategies for maximizing profit; and
 - (D) create a business plan.
- (8) The student reviews the importance of management systems such as health, safety, and environmental and their function in performance and regulatory compliance. The student is expected to:
- (A) determine local safety and sanitation requirements;
 - (B) explain how guests and property are protected to minimize losses or liabilities;
 - (C) outline safety and security issues and analyze solutions for individuals or groups in multiple environments to minimize risks;
 - (D) recognize potential, real, or perceived emergency situations such as a natural disaster or terrorist threat in order to respond appropriately;
 - (E) evaluate equipment for elements such as safety, functionality, and durability; and
 - (F) determine most appropriate sources of assistance such as self, coworkers, guests, the Federal Emergency Management Agency (FEMA), or first responders to use in varied emergency situations.
- (9) The student understands roles within teams, work units, departments, organizations, inter-organizational systems, or the larger environment. The student is expected to:
- (A) implement a set of operating procedures that results in profitable operations;
 - (B) create a detailed customer service plan or process to provide maximum customer service;

- (C) prepare a staffing guide to schedule various staff positions;
 - (D) evaluate inventory management systems used in the hospitality industry to result in profitable operations;
 - (E) describe current industry collaborations or trends that provide more inclusive products or services to customers; and
 - (F) compare and contrast organizational structures of operations such as lodging, food and beverage, travel, and recreation.
- (10) The student uses technological knowledge and skills required in food and beverage service. The student is expected to:
- (A) evaluate prepared foods for quality and presentation to set quality standards in accordance with company standards;
 - (B) practice basic nutrition skills by planning, preparing, and presenting quality foods; and
 - (C) evaluate types of kitchen equipment to match equipment with correct cooking methodology.
- (11) The student uses technological knowledge and skills required in hotel services. The student is expected to:
- (A) describe the necessary information collected during the registration process;
 - (B) explain how room rates are established;
 - (C) explain how standard operating guidelines such as availability, room status, and guest satisfaction are used to assign rooms to arriving guests;
 - (D) examine the account settlement procedures on different methods of payment;
 - (E) explain how a hotel's computer system is used to create guest accounts; and
 - (F) summarize correct check-out procedures to prevent oversights or errors.
- (12) The student uses technological knowledge and skills required in travel and tourism. The student is expected to:
- (A) develop technical vocabulary for lodging, food and beverage service, recreation, and travel;
 - (B) compare and contrast diverse transportation options;
 - (C) integrate various or diverse elements of the travel and tourism industry to create a personalized travel experience for a customer; and
 - (D) compare and contrast products and services from related industries.

§130.261. Practicum in Hospitality Services (Two to Three Credits), Adopted 2015.

- (a) General requirements. This course is recommended for students in Grades 11 and 12. Recommended prerequisite: Hospitality Services.
 - (1) A student shall be awarded two credits for successful completion of this course when the student participates in at least an average of 10 hours, but less than 15 hours, per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Hospitality and Tourism Career Cluster.
 - (2) A student shall be awarded three credits for successful completion of this course when the student participates in an average of 15 hours per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Hospitality and Tourism Career Cluster.
- (b) Introduction.

- (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Hospitality and Tourism Career Cluster focuses on the management, marketing, and operations of restaurants and other food/beverage services, lodging, attractions, recreation events, and travel-related services.
 - (3) Practicum in Hospitality Services is a unique practicum experience to provide opportunities for students to participate in a learning experience that combines classroom instruction with actual business and industry career experiences. Practicum in Hospitality Services integrates academic and career and technical education; provides more interdisciplinary instruction; and supports strong partnerships among schools, businesses, and community institutions with the goal of preparing students with a variety of skills in a fast-changing workplace. Students are taught employability skills, including job-specific skills applicable to their training plan, job interview techniques, communication skills, financial and budget activities, human relations, and portfolio development. Practicum in Hospitality Services is relevant and rigorous, supports student attainment of academic and technical standards, and effectively prepares students for college and career success.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) research and produce a variety of relevant employment opportunities;
 - (B) differentiate the essential workplace skills in the career acquisition process;
 - (C) practice and complete employment-related documents such as job applications (written and electronic formats) and I-9 and W-4 forms;
 - (D) model proper interview techniques in various situations;
 - (E) formulate verbal, nonverbal, and written communication skills;
 - (F) develop and properly use appropriate electronic communication tools; and
 - (G) display effective listening skills used in the workplace.
 - (2) The student develops skills for success in the workplace. The student is expected to:
 - (A) formulate and model appropriate grooming and appearance for the workplace;
 - (B) model dependability, punctuality, and initiative;
 - (C) display positive interpersonal skills such as respect for diversity;
 - (D) differentiate types of diversity from both the employer and customer perspective;
 - (E) exhibit appropriate business and personal etiquette in the workplace;
 - (F) exhibit productive work habits, ethical practices, and a positive attitude;
 - (G) integrate knowledge of personal and occupational safety practices in the workplace;
 - (H) collaborate with others to support the organization and complete assigned tasks as a team;
 - (I) organize work to fulfill responsibilities and meet deadlines; and

- (J) compare and contrast the relationship of good physical and mental health strategies for job success and work-life balance.
- (3) The student compares and contrasts the importance of work ethics, employer expectations, interaction with diverse populations, and communication skills in the workplace. The student is expected to:
- (A) defend personal integrity as it affects human relations on the job;
 - (B) study and develop characteristics of successful working relationships such as teamwork, conflict resolution, self-control, and ability to accept criticism;
 - (C) analyze and defend employer expectations;
 - (D) demonstrate respect for the rights of others;
 - (E) compare and contrast the hospitality code of ethics and ethical standards; and
 - (F) support organizational policies and procedures.
- (4) The student applies academics with career-readiness skills. The student is expected to:
- (A) apply mathematical skills to business transactions;
 - (B) interpret data from documents such as tables, charts, and graphs to estimate and find solutions to problems; and
 - (C) organize and compose workplace business documents.
- (5) The student applies ethical behavior standards, safety procedures, and legal responsibilities within the workplace. The student is expected to:
- (A) compare and contrast published workplace policies;
 - (B) apply responsible and ethical behavior;
 - (C) evaluate provisions of state and federal labor laws; and
 - (D) evaluate the employer's and employee's fiduciary responsibilities to customers such as breach of confidentiality, safety, and privacy.
- (6) The student models strategies and technique to develop interpersonal skills. The student is expected to:
- (A) model effective interpersonal and team-building skills involving situations with diverse individuals; and
 - (B) model leadership through participation in activities such as career and technical student organizations.
- (7) The student evaluates advancement opportunities and career paths in the industry. The student is expected to:
- (A) analyze future employment in occupational areas;
 - (B) develop an entrepreneurial opportunity in the hospitality services area;
 - (C) compare and contrast salaries, industry demands, and challenges for various jobs in hospitality services; and
 - (D) evaluate the changing global workplace and future trends using governmental and other resources.
- (8) The student identifies skills and attributes necessary for professional advancement. The student is expected to:
- (A) evaluate continuing education opportunities that enhance career advancement and promote lifelong learning; and

- (B) formulate effective strategies to secure, maintain, and terminate employment.
- (9) The student understands roles within teams, work units, departments, organizations, and the larger environment of the hospitality services industry. The student is expected to:
 - (A) explain the different types and functions of all departments such as food and beverage to understand their impact on customer service;
 - (B) illustrate proficiency with duties in each of the departments of a hotel or tourism venue;
 - (C) compare and contrast lodging properties;
 - (D) analyze the differences between chain and franchise lodging operations; and
 - (E) explore the job duties in travel and tourism, recreation, and amusement and attraction venues.
- (10) The student understands the knowledge and skills required for careers in the lodging industry. The student is expected to:
 - (A) examine, understand, and articulate job-specific technical vocabulary;
 - (B) explain technical procedures needed to meet guest needs such as registration, rate assignment, room assignment, and determination of payment methods;
 - (C) research and create a meeting/event company;
 - (D) evaluate current and emerging technologies to improve guest services; and
 - (E) determine the correct procedures for the traditional hotel guest cycle.
- (11) The student documents in manual and electronic format acquired technical knowledge and skills from coherent plan of study. The student is expected to:
 - (A) produce a professional portfolio to include:
 - (i) a current resume;
 - (ii) official documentation of attainment of technical skill competencies;
 - (iii) recognitions, awards, and scholarships;
 - (iv) community service activities;
 - (v) student organization participation;
 - (vi) practicum supervisor evaluations;
 - (vii) letters of recommendation;
 - (viii) cover letters;
 - (ix) documentation of preparation for state or national industry certification such as food sanitation certification; and
 - (x) any other supporting documents;
 - (B) present for review the professional career portfolio to interested stakeholders;
 - (C) evaluate employment options, including salaries and benefits;
 - (D) determine effective money management and financial planning techniques to manage:
 - (i) insurance and benefits;
 - (ii) taxes;
 - (iii) retirement;
 - (iv) relocation costs;

(v) a budget;

(vi) housing costs; and

(vii) transportation costs; and

(E) develop a personal budget based on career choice using effective money management and financial planning techniques.