Tennessee CTE

Nutrition Science & Diet Therapy

Safety & Sanitation

1. **Compile and critique safety and sanitation procedures related to handling, preparing, storing, and serving food from industry-approved technical manuals and government factsheets. Identify and review general common laboratory safety procedures including but not limited to prevention and control procedures. Incorporate safety procedures and complete safety test with 100 percent accuracy.** 1

Nutrition and Health Overview

2. **Gather relevant information from multiple authoritative print and digital sources related to the importance of a balanced diet in the achievement of optimum nutrition. Compare and contrast nutritional needs of a normal healthy diet with the needs of a client being treated for and/or recovering from illness. Prepare an informative artifact to discuss the findings.** 2

Nutrient Metabolism

3. **Create a model and/or graphic illustrating the major metabolic pathways that are used to produce energy for the body. Write a narrative report explaining the chemical processes that occur at each stage in the pathway. Categorize each stage as an anabolic or a catabolic reaction, citing relevant evidence from academic or medical materials. Stages include:** 3
    a. Glycolysis 3.A
    b. Kreb's cycle 3.B
    c. Electron Transport 3.C
    d. Fermentation 3.D

4. **Synthesize information on energy balance. Apply available tools and equations to calculate Estimated Energy Requirements (EER) for an individual. Determine the energy content of an individual's diet. Based on the client's EER and calculated caloric intake, predict the effect on the client's weight. Calculate the following:** 4
    a. Physical Activity Level (PAL) 4.A
    b. Total Energy Expenditure (TEE) 4.B
    c. Basal Energy Expenditure (BEE) 4.C
    d. Thermic Effect of Food (TEF) 4.
    Metabolic Equivalents (METs) 4.E

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Nutrients and Their Relation to Disease

5 **Gather relevant information from multiple scientific and technical texts to evaluate and create a model or graphic that illustrates the scientific properties of water. Using the research, write an explanatory essay detailing the functions of water in its relation to food, digestion, and maintenance of the body.** 5

6 **In a class discussion, compare and contrast the diseases associated with contaminated drinking water and the mortality rate of impoverished regions or communities using resources such as the U.S. National Library of Medicine or the National Institutes of Health. Suggested Labs: The Purification of Water** 6

7 **Analyze research to determine domain-specific terms that describe the molecular structure of carbohydrates and fiber in relation to their scientific function in food, food preparation, and the body. Create a graphic illustration/model to compare and contrast the differences in complex and simple carbohydrates and fiber. Suggested Labs: Hydrolysis of Sugar; Sweetness & Solubility; Digestion of Starch** 7

8 **Research the impact of carbohydrates on diabetes, differentiating between Type I and Type II. Cite specific textual evidence from academic research, medical literature, and news articles in order to:** 8

- a Describe the disease/condition, including symptoms and organ(s) affected. 8.A
- b Justify the role of nutrition as a contributor to the disease/condition and highlight specific dietary recommendations for minimizing those contributions. 8.B
- c Justify the role of nutrition in the treatment of the disease/condition, outlining a healthy eating plan and providing lists of specific foods/nutrients to reduce or exclude from the diet and those that should be included in the diet. 8.C
- d Make recommendations for other lifestyle changes that will reduce the risk or aid in the therapy for the disease/condition. 8.D
- e Prepare a menu item that meets the nutritional recommendations for diabetics. 8.E

Suggested Labs: Meal Preparation for diabetic patient; Count the Carbs activity

9 **Research the correlation between starch consumption and Celiac Disease, citing evidence from academic journals and medical literature in order to** 9

- a Describe the disease/condition, including symptoms and organ(s) affected 9.A
- b Explain the digestive problems and the impact on digestion and absorption of nutrients 9.B
- c Make recommendations for other lifestyle changes that will reduce the risks or aid the therapy for the disease/condition 9.C
- d Prepare a menu item that meets the nutritional recommendations for individuals with Celiac Disease 9.D

ıggested Labs: Compare & Contrast Alternative Ingredients for Gluten in Foods

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10 **Analyze the properties and composition of lipids in relation to their functions in food preparation and to the body. Compare and contrast the composition of saturated and unsaturated fats using domain-specific terms in a class discussion or by creating a model/graphic. Write an explanatory text about the impact of nutrition on cardiovascular health, focusing on hypertension, stroke, and coronary artery disease.** 10

11 **Investigate the correlation between fats in the diet and coronary artery disease, citing evidence from academic research, medical literature, and news articles in order to:** 11

- a Describe the disease/condition, including symptoms and organ(s) affected. 11.A
- b Justify the role of nutrition as a contributor to the disease/condition, and highlight specific dietary recommendations for minimizing those contributions. 11.B
- c Justify the role of nutrition in the treatment of the disease/condition, outlining a healthy eating plan and providing lists of specific foods/nutrients to reduce or exclude from the diet and those that should be included in the diet. 11.C
- d Make recommendations for other lifestyle changes that will reduce the risks or aid the therapy for the disease/condition. 11.D
- e Prepare a menu item that meets the nutritional recommendations for achieving good cardiovascular health. 11.E

Suggested Labs: Bomb Calorimeter; Extraction of Fat in Hot Dogs; Fat Content in Beef; Testing Oils in Frying; Alternative Fats in Foods; Low Fat Cookery Lab

Proteins

12 **Cite textual evidence from academic research or medical literature to describe the molecular structure of proteins, and identify essential and nonessential amino acids. Compare and contrast complete and incomplete proteins by analyzing the functions of protein in food and their importance in the body. Research nutritional diseases related to insufficient protein. Describe ways in which protein is used in food preparation. Suggested Labs: Effects of Minerals on Protein; Protein in Eggs** 12

13 **Determine the meaning of domain-specific terms to analyze the properties and composition of minerals within the human diet. Write an explanatory text describing the chemical and molecular composition of different minerals.** 13

14 **Drawing on findings from medical research, compare and contrast the advantages and disadvantages of the use of food additives in processed products. Create a list of regulations governing the use of food additives established by the Food and Drug Administration (FDA) and U.S. Department of Agriculture (USDA). Suggested Labs: Conduct a sensory evaluation of foods with and without food additives** 14

15 **With regards to minerals and osteoporosis, cite specific textual evidence, medical literature, and news articles in order to:** 15

- a Describe the disease/condition, including symptoms and organ(s) affected. 15.A

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b Justify the role of nutrition as a contributor to the disease/condition and highlight specific dietary recommendations for minimizing those contributions. 15.B

c Justify the role of nutrition as a in the treatment of the disease/condition, outlining a healthy eating plan and providing lists of specific foods/nutrients to reduce or exclude from the diet and those that should be included in the diet. 15.C

d Make recommendations for other lifestyle changes that will reduce the risks or aid the therapy for the disease/condition. 15.D

e Prepare a menu item that meets the nutritional recommendations for maintaining good bone health. 15.E

16 **Use nutritional journals or articles to investigate the chemical properties of water-soluble and fat-soluble vitamins. Create a graph that classifies each vitamin, the chemical properties, and deficiency signs in the human body. Suggested Labs: Vitamin C Titration (using pipettes); Fat Soluble Vitamins** 16

17 **Write a research paper or conduct a project on one of the following diseases linked to vitamin consumption issues, using appropriate digital search resources and academic writing. Summarize symptoms, common causes, prevention strategies, and treatments. Topics might include but are not limited to:** 17

a Beriberi 17.A

b Pellagra 17.B

c Scurvy 17.C

d Rickets 17.D

Clinical Nutritional Assessments

18 **Compare and contrast the types of data collected, the insights they give into the nutritional status of a client, and the limitations of the data for the following four types of nutritional assessments used by a registered dietitian or other trained health care professional.** 18

a Historical information 18.A

b Anthropometric data 18.B

c Physical examination 18.C

d Laboratory tests 18.D

Nutrition Diagnosis and Intervention

19 **Prepare a presentation or informative essay that explains the Nutrition Care Process to clients and/or their families and the role it plays in the total health care of a client. Outline what occurs in each of the four phases of the process: nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation. Include a list of frequently asked questions and their answers.** 19

Diet Analysis

20 **Quantify the nutrient intake of individuals based on food journals, observations, or other reports. Using appropriate databases, determine the intake of macro- and micro-nutrients. Graph the results compared to the recommended intake of**

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	each nutrient. Write an explanation on why the data collected and analyzed would or would not be sufficient to make dietary changes. 20
Behavioral-Environmental Assessments: The Individual Community	**21 Review the tools for assessing community nutritional environment. Select one tool that identifies existing problems in the local community. Prepare a public serve announcement in the form of an editorial, a brochure, an online advertisement, or other artifact with the purpose of informing community members about the problem(s).** 21
	22 Compare issues related to hunger and malnutrition, food insecurity, and food insufficiency locally, nationally, and globally. Describe short-term and sustainable development relief efforts used to combat these problems. 22
The Relationship of Nutrition to Specific Diseases	**23 Investigate obesity using academic research and news articles. Cite specific textual evidence in order to** 23 a Describe the need for prevention of obesity to begin at an early age. 23.A b Analyze the relationship between fat cell development and metabolism and the role of set-point theory in maintaining weight losses or gain. 23.B c Differentiate between causes of obesity including genetics and environmental factors. 23.C d List health problems associated with obesity. Include the dangers of fad diets, weight loss products and other gimmicks. 23.D e Justify the use of a research-based weight-loss strategy that ensures adequate nutrition. 23.E f Make a claim about the need for extreme measures (such as surgery) for extreme cases, supporting claim(s) with reasoning and evidence from research. 23.
	Suggested Labs: Anthropometry Lab; Nutritious Snack Lab
	24 Differentiate between the major eating disorders (anorexia, bulimia, binge eating) and other forms of disordered eating to create a research project specifically addressing the following: 24 a Describe the disease/condition, including symptoms and specific ways the body is affected. 24.A b Justify the role of nutrition as a contributor to the disease/condition and highlight specific dietary recommendations for minimizing those contributions. 24.B c Justify the role of nutrition in the treatment of the disease/condition, outlining a healthy eating plan and providing lists of specific foods/nutrients to reduce or exclude from the diet and those that should be included in the diet. 24.C d Make recommendations for other lifestyle changes that will reduce the risk or aid in the therapy for the disease/condition. 24.D
	ıggested labs: Demonstrate the effect of acid erosion on teeth

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25 **Using scientific articles and domain-specific vocabulary, define acidic and basic as they relate to nutrition. Create a pH scale including examples of common acidic and basic foods. In an accompanying narrative, summarize symptoms, common causes, and treatments for heartburn, acid indigestion, and ulcers. Suggested Labs: Acids & Bases Indicators in Food** 25

26 **For each of the following common digestive problems, summarize symptoms, common causes, prevention strategies, and treatments. Explain how they can impact the digestion and absorption of nutrients in the digestive system.** 26

- a Choking 26.A
- b Vomiting 26.B
- c Diarrhea, irritable bowel syndrome, colitis 26.C
- d Constipation 26.D
- e Belching and gas 26.E
- f Heartburn and acid indigestion 26.
- g Ulcers 26.G

27 **Differentiate between food allergies and food intolerances, and describe the body's reaction to each. Research the eight most common food allergens. Describe treatment for an allergic reaction. Cite specific textual evidence in the application of knowledge, including:** 27

- a Describe how the immune system of a person with a food allergy responds when exposed to the food allergen. Contrast this to reactions originating from a food intolerance. 27.A
- b Outline precautions to take when avoiding food allergens and/or foods to which they have an intolerance both at home and when eating out. 27.B
- c Recommend food substitutes and recipe modifications to avoid problematic foods, citing specific reasoning and evidence to justify the recommendation. 27.C

Suggested labs: Using indicators identify which "student" (solution) is allergic (shows reaction to) to an allergen

28 **Assess the impact of nutrition on cancer focusing on the body sites affected. Cite specific textual evidence from academic research, medical literature, and news articles in order to:** 28

- a Describe the disease/condition, including symptoms and organ(s) affected. 28.A
- b Justify the role of nutrition as a contributor to the disease/condition and highlight specific dietary recommendations for minimizing those contributions. 28.B
- c Justify the role of nutrition in the treatment of the disease/condition, outlining a healthy eating plan for those undergoing treatments such as chemotherapy and radiation, and providing lists of specific foods/nutrients that act as anti-promoters from the diet and those that should be included in the diet. 28.C

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d Make recommendations for other lifestyle changes that will reduce the risk or aid in the therapy for the disease/condition. 28.D

e Prepare a menu item that meets the recommendations for reducing the nutritional risks for developing cancer. 28.E

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29 From class research on the relationship between nutrition and specific diseases, select a topic where the need for further research has been identified. As a class or in small groups, outline the design for an experiment to continue the research. 29