

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY  
HRI 120 – PRINCIPLES OF FOOD PREPARATION (4 CR.)**

**Course Description**

Applies scientific principles and techniques to the preparation of food, including carbohydrates, such as fruits, vegetables, sugars and starches; fats, including animal and vegetable, as well as natural and manufactured; and proteins, such as milk, cheese, eggs, legumes, fish and shellfish. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**General Course Purpose**

This course provides the student who is preparing for a career in the hospitality industry with basic scientific principles of food preparation, with emphasis on quality control.

**Course Prerequisites/Co-requisites**

None

**Course Objectives**

Upon completion of this course, the student should be able to:

- Critique and analyze food products and recipes on the basis of food preparation principles
- Identify the characteristics of high quality food products based on the factors that affect the physical, chemical and biological reactions of carbohydrates, fats, and protein
- Employ basic equipment in small quantity food preparation
- Demonstrate the safe use and care of equipment used in food preparation
- Know food preparation terminology and demonstrate techniques employed in small quantity food preparation
- Relate the importance of professional appearance and behavior to sanitation and safety in the laboratory
- Know basic information about the nutritive value of carbohydrates, fats, and protein
- Evaluate products prepared in the laboratory by comparing with established standards
- Gain experience of applying principles of measurement of ingredients
- Identify and use various kinds of food thermometers
- Know the graduation scale on each type of thermometer
- Analyze the function of water and heat in food preparation: (solvent, dispersing agent, hydration, medium for heat transference, ionization)
- Describe physical states (solid, liquid, gas) of water
- Evaluate the factors that determine the preparation of high quality vegetables
- Memorize the names of vegetable pigments
- Recognize the nutritional importance of vegetables in the diet
- Study the relationship between variety characteristics and quality characteristics in fruits and vegetables
- Test color, flavor, textural changes in vegetables caused by acids, alkalis, minerals, enzymes, and heat
- Determine the effect of method and time of cooking on vegetable color, flavor, and structure
- Prepare and examine the effects on vegetables using different cooking methods, i.e., baking, broiling, sautéing, stir-frying, soufflés, and casseroles
- Evaluate the factors that determine the preparation of high quality fruits
- Study the conditions that affect enzymatic browning
- Study the effect of breakdown of compounds and hemicellulose on cell structure
- Explain the effect of osmosis on cell structure

- Prepare pectin gels
- Know the relationship between pectin, protopectin, and pectic acid compounds in gel formation
- Taste and name different types of fruits; tropical/sub-tropical
- Illustrate methods of starch granule separation used in gelatinization of the starch
- Emphasize the necessity for separation of starch granules for even hydration and gelatinization
- Study quality characteristics of selected starch thickened food products
- Demonstrate the increase in viscosity in starch thickened products
- Illustrate acceptable methods for the preparation of white sauces
- Show the relative degrees of viscosity of white sauces prepared with varying ratios of flour to milk
- Discuss the use of these sauces in food preparation
- Demonstrate methods of cookery which retain the nutrients added to enriched rice and pasta products
- Demonstrate methods of cereal cookery
- Learn principles of salad dressing formation based on emulsion principles
- Define temporary and permanent emulsions
- Classify salad dressing according to emulsion type
- Learn the procedure of reforming broken emulsions for use in other recipes
- Recognize common emulsifiers used in food preparation
- Differentiate between a salad dressing and mayonnaise based on standards of identity
- Learn the role of salads in menus and principles of salad preparation
- Define appetizer, accompaniment, main course, and dessert salads
- Prepare salad recipes and evaluate according to standard principles of salad preparation
- Learn the name and distinguishing quality characteristics of green used in salad preparation: iceberg, leaf, endive, romaine, etc
- Study the appropriate type of dressing for main salad classifications
- Discuss and illustrate marinades and salad dressings
- Acquaint students with the properties of fats and oils
- Define smoke point and acrolein
- Learn appropriate deep fat frying temperatures for different foods - protein and carbohydrates
- Study factors that affect the smoke point of fats, and rate of fat decomposition
- Acquaint students with factors that influence fat absorption by deep fat fried foods
- Illustrate principles involved in the preparation of gelatin products
- Compare quality characteristics of a gelatin prepared from plain dry gelatin, and a commercial gelatin mix
- Illustrate and discuss factors that affect the strength of a gelatin gel and gelatin foam
- Identify through laboratory experiments and observation the characteristics of high quality protein products
- Observe denaturation and coagulation of protein foods in the laboratory
- Identify through laboratory experiments and observation the characteristics of high quality protein products
- Acquaint the student with effect of acid on milk proteins
- Identify the role of enzymes in coagulation of milk proteins
- Appreciate the fact that stability of milk proteins may be both desirable and undesirable
- Observe the effect of heat and temperature on milk proteins
- Recognize the different types of milk products in the market place and their uses in a food service operation
- Compare the flavor, cost, convenience and use in cooking of various types of milk
- Understand the relationship between coagulation of milk proteins and the manufacture of natural cheese
- Taste and evaluate natural cheeses and processed cheese products
- Study factors inherent in the production of a natural cheese
- Contrast and compare natural cheese and process cheese
- Define the term "process" cheese and processed cheese food
- Demonstrate the effect of emulsifiers on fat stability in cheese exposed to heat

- Demonstrate the effect of heat on the protein and lactose in cheese
- Observe the effect of length of aging and microorganisms used in aging on cheese flavor
- Discuss the effect of high heat or prolonged heating on cheese proteins
- Illustrate and discuss quality characteristics of shell eggs
- Demonstrate selected methods for cooking eggs
- Describe selected factors that affect the coagulation of egg proteins
- Acquaint the students with differences between stirred and baked custards
- Determine the effect of storage on egg quality
- Identify changes occurring in eggs as they deteriorate
- Demonstrate methods of minimizing the likelihood of forming a ferrous sulfide ring in hard cooked eggs
- Differentiate between the coagulation temperature of egg whites, egg yolks, and whole egg
- Explain the procedures to use while preparing an egg white foam of optimum volume, texture, and stability
- Identify the factors contributing to volume in egg white foams
- interpret the role of acid and/or sugar in the coagulation of egg white proteins
- Prepare a soufflé
- Diagram primal cuts on a beef carcass
- Differentiate between primal cuts and secondary cuts on a beef carcass
- Prepare and compare dry and moist methods of meat cookery
- Discuss and illustrate factors that determine the tenderness of a cut of meat before cooking
- Discuss the effect of cooking on the quality characteristics of cooked meat
- Identify differences in fat, bone, muscle, and texture of meat cuts from different animals
- Acquaint the student with poultry classified as tender and discuss typical quality characteristics of tender birds
- Review the factors that cause a cut of meat to be considered less tender
- Illustrate moist heat methods of cooking less tender cuts of meat
- Demonstrate that collagen will hydrolyze in the presence of heat and moisture
- Discuss the relative effectiveness of powdered enzyme, fresh enzyme and acid marinades in tenderizing meat
- Evaluate the palatability of meats prepared with mechanical tenderizing, enzyme, and acid tenderizing
- Distinguish between inspection, quality grading, and yield grading of meat and meat products
- Identify the quality grades in meat products/poultry and eggs
- Distinguish between fin-fish and shellfish and memorize the market forms of each
- Prepare different types of fin and shellfish utilizing moist and dry heat methods of preparation
- Determine the effect of pH on the rehydration of dried legumes outline optimal methods for softening legumes
- Illustrate the use of legumes as meat substitutes
- Acquaint students with the different variety of legumes
- Observe the effect of adding calcium or acid to legumes
- Acquaint the student with the biscuit, pastry and muffin method of combining ingredients for baked products
- Observe changes that occur in muffin batter with extended stirring of ingredients
- Observe the effect of kneading on biscuit dough
- Demonstrate the effect of the buttermilk (acid) leavening system on quality of biscuits
- Illustrate leavening action as water is converted to steam in baked products
- Identify characteristics of the basic sauces
- Prepare basic sauces

### Major Topics to be Included

- Food Choices
- Food Safety
- Heat Transfer
- Weights / Measures
- Knife Skills
- Seasonings / Flavoring
- Quick Breads
- Pasta and Cereal
- Grains
- Legumes
- Vegetables
- Fruits
- Fats and Oils
- Salads
- Gelatin
- Meat
- Poultry
- Seafood
- Milk, Eggs, Cheese