## Coverage of IFT Core Competencies

A .Where <u>each</u> of the IFT Core Competencies is covered with the curriculum of <u>required</u> food science courses

**Key:**

***I - Introduce***
***C – Cover to some extent***
***D – Cover in detail***

| IFT Core Competencies | | | Basic Food Production HOMT 0314 | Introduction to Food Science FOSC 0301 | Food Sensory Evaluation FOSC 0302 | Methods of Food Processing (meat , dairy, fruits and FOSC 0403 | Professional Seminar NUSC 0501 | Methods of Food and Nutrition Analysis/Laboratory FOSC 0405/ 406 | Food Microbiology FOSC 0407 | Food Chemistry FOSC 0410 | Food Process Engineering Technology FOSC 0471 | Product Research innovation and Sensory Evaluation of FOSC 0473 | Seminar in Food Science FOSC 0400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **I. Food Chemistry and Analysis** | **A**. Structure and properties of food components, including water, carbohydrates, protein, lipids. Other nutrients and food additives | **1**. know the chemistry underlying the properties and reactions of various food components | **C** | **C** | | **C** | | **D** | **C** | **D** | | **C** | **C** |
| | **B**. Chemistry of changes occurring during processing, storage and utilization | **1**. Have sufficient knowledge of food chemistry to control reactions in foods | **C** | | | **C** | | **D** | | **D** | | **C** | **C** |
| | | **2**. Know the major chemical reactions that limit shelf life of foods | **C** | **C** | | **D** | | **C** | **C** | **D** | | | |
| | | **3**. Use the laboratory techniques common to basic and applied food chemistry | **C** | **C** | | **C** | | **D** | **D** | **D** | | **D** | |
| | **C**. Principles, methods, and techniques of qualitative and quantitative physical, chemical, and biological analyses of food and food ingredients | **1**. Know the principles behind analytical techniques associated with food | **C** | | | **C** | | **D** | | **C** | | | |
| | | **2**. Be able to select the appropriate analytical technique when presented with a practical problem | **C** | **C** | | **C** | | **D** | | **C** | | **D** | |
| | | **3**. Demonstrate practical proficiency in food analysis laboratory | **C** | **I** | | **C** | | **D** | **C** | **D** | | | |
| **II. Food Safety and Microbiology** | **A**. Pathogenic and spoilage microorganisms in foods | **1**. Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow | **C** | **C** | | **C** | | | **D** | | **C** | | |
| | | **2**. Identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods | **C** | **C** | | **C** | | | **D** | | **C** | | |
| | | **3**. Utilize laboratory techniques to identify microorganisms in foods | **C** | **I** | | **C** | | | **D** | | | | |
| | **B**. Beneficial microorganisms in food systems | **1**. Know the principles involving food preservation via fermentation processes | **C** | **D** | | **D** | | | **D** | **C** | | | |
| | **C**. Influence of the food system on the growth and survival of microorganisms | **1**. Know the role and significance of microbial inactivation, adaptation and environmental factors (i.e., Aw, pH, temperature) on growth and response of microorganisms in various environments | **C** | **D** | | **C** | | | **D** | | **D** | | |
| | **D**. Control of microorganism | **1**. Identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly | **C** | **D** | | **D** | | | **D** | | **C** | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | inactivated, killed or made harmless in foods | | | | | | | | | | | |

**Key:**

***I - Introduce***
***C – Cover to some extent***
***D – Cover in detail***

## IFT Core Competencies

| | | | Basic Food Production HOMT 0314 | Introduction to Food Science FOSC 0301 | Food Sensory Evaluation FOSC 0302 | Methods of Food Processing (meat , dairy, fruits and FOSC 0403 | Professional Seminar NUSC 0501 | Methods of Food and Nutrition Analysis/Laboratory FOSC 0405/ 406 | Food Microbiology FOSC 0407 | Food Chemistry FOSC 0410 | Food Process Engineering Technology FOSC 0471 | Product Research innovation and Sensory Evaluation of FOSC 0473 | Seminar in Food Science FOSC 0400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **III. Food Processing and Engineering** | **A**. Characteristics of raw food material | **1**. Know the source and variability of raw food material and their impact on food processing operations | **C** | **C** | **C** | **C** | | | **C** | **D** | **D** | **C** | **C** |
| | **B**. Principles of food preservation including low and high temperatures, water activity, etc. | **1**. Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage | **C** | **C** | | **D** | | | **D** | | **C** | | |
| | | **2**. Know the principles that make a food product safe for consumption | **C** | **C** | | **D** | | | **D** | | **C** | | |
| | **C**. Engineering principles including mass and energy balances, thermodynamics, fluid flow, and heat and mass transfer | **1**. Know the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings | **C** | **I** | | **C** | | | | | **D** | | |
| | | **2**. Be able to use the mass and energy balances for a given food process | **C** | **I** | | **C** | | | | | **D** | | |
| | | **3**. Know the unit operations required to produce a given food product | **C** | **I** | | **C** | | | | | **D** | | |
| | **D**. Principles of food processing techniques, such as freeze drying, high pressure, aseptic processing, extrusion, etc. | **1**. Know the principles and current practices of processing techniques and the effects of processing parameters on product quality | **C** | **I** | **C** | **D** | | **C** | **C** | **C** | **D** | | |
| | **E**. Packaging materials and methods | **1**. Know the properties and uses of various packaging materials | **C** | **C** | **C** | **D** | | **C** | **C** | **I** | **D** | | |
| | **F**. Cleaning and sanitation | **1**. Know the basic principles and practices of cleaning and sanitation in food processing operations | **D** | **C** | **C** | **D** | | | **D** | | **C** | | |
| | **G**. Water and waste management | **1**. Know the requirements for water utilization and waste management in food and food processing | **C** | **C** | **C** | **D** | | | **I** | | **C** | | |
| **IV. Applied Food Science** | **A**. Integration and application of food science principles (food chemistry, microbiology, engineering/processing, etc.) | **1**. Be able to apply and incorporate the principles of Food Science in practical, real-world situations and problems | **C** | **C** | **C** | **C** | | **D** | **D** | **D** | **D** | **D** | |
| | **B**. Computer skills | **1**. Know how to use computers to solve Food Science problems | **C** | **C** | **C** | **C** | | **D** | **C** | **C** | **D** | **D** | |
| | **C**. Statistical skills | **1**. Be able to apply statistical principles to Food Science applications | **C** | **C** | **D** | **C** | | **D** | **C** | | | **D** | |
| | **D**. Quality assurance | **1**. Be able to apply the principles of Food Science to control and assure the quality of food products | **C** | **C** | **C** | **D** | | **I** | **C** | **C** | | **D** | |

**Key:**

***I - Introduce***
***C – Cover to some extent***
***D – Cover in detail***

## IFT Core Competencies

| | | | Basic Food Production | Introduction to Food Science | Food Sensory Evaluation | Methods of Food Processing (meat , dairy, fruits …) | Professional Seminar | Methods of Food and Nutrition Analysis/Laboratory | Food Microbiology | Food Chemistry | Food Process Engineering Technology | Product Research innovation and Sensory Evaluation of | Seminar in Food Science |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HOMT 0314 | FOSC 0301 | FOSC 0302 | FOSC 0403 | NUSC 0501 | FOSC 0405/ 406 | FOSC 0407 | FOSC 0410 | FOSC 0471 | FOSC 0473 | FOSC 0400 |
| **V. Success Skills** | **A**. Communication skills (i.e., oral and written communication, listening, interviewing, etc.) | **1**. Demonstrate the use of oral and written communication skills. This includes such skills as writing technical reports, letters and memos; communicating technical information to a non-technical audience; and making formal and informal presentations | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **C** | **D** | **D** |
| | **B**. Critical thinking/problem solving skills (i.e., creativity, common sense, resourcefulness, scientific reasoning, analytical thinking, etc.) | **1**. Be able to develop a process for solving and preventing reoccurrence of ill-defined problems; know how to use library and internet resources to search for quality information, and solve a problem; and make thoughtful recommendations | **C** | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |
| | | **2**. Apply critical thinking skills to new situations | **C** | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |
| | **C**. Professionalism skills (i.e., ethics, integrity, respect for diversity) | **1**. Commit to the highest standards of professional integrity and ethical values | **C** | **C** | **D** | **C** | **D** | **O** | **D** | **D** | **C** | **D** | **D** |
| | | **2**. Work and/or interact with individuals from diverse cultures | **C** | **C** | **O** | **C** | **D** | **O** | **D** | **D** | **D** | **D** | **D** |
| | **D**. Life-long learning skills | **1**. Explain the skills necessary to continually educate oneself | **C** | | **D** | | | **O** | **D** | **D** | **D** | **D** | **D** |
| | **E**. Interaction skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.) | **1**. Work effectively with others | **C** | **C** | **D** | **D** | **D** | **O** | **D** | **D** | **D** | **D** | **D** |
| | | **2**. Provide leadership in a variety of situations | **C** | **C** | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |
| | | **3**. Deal with individual and/or group conflict | **C** | **C** | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |
| | **F**. Information acquisition skills (i.e., written and electronic searches, database, internet, etc) | **1**. Independently research scientific and nonscientific information | **C** | **O** | **D** | **C** | **C** | **D** | **D** | **D** | **D** | **D** | **D** |
| | | **2**. Competently use library resources | **C** | **D** | **D** | **C** | **C** | **D** | **D** | **D** | **D** | **D** | **D** |
| | **G**. Organizational skills (i.e., time management, project management, etc.) | **1**. Manage time effectively | **C** | | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |
| | | **2**.Know how to facilitate group projects as well as be a good team member | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |
| | | **3**. Handle multiple tasks and pressures | **C** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** | **D** |

**Documenting IFT Core Competencies**

Please indicate where each of the IFT Core Competencies is covered within your curriculum of required food science courses and to what level (of Bloom's Taxonomy). This form is to be used for completing. Use the following abbreviations to indicate whether the competency is introduced (I), covered to some extent © or covered in detail (D). For Bloom's Taxonomy, use the following:

**Coverage of competency abbreviations**
**Abbreviations**

I = introduced
C = covered to some extent
D = covered in detail

**Bloom's Taxonomy of Cognitive Domain**

1. Knowledge (or recall)
2. Comprehension (or translate)
3. Application (or generalize)
4. Analysis (or breakdown/discover)
5. Synthesis (or compose)
6. Evaluation (or judge)

**Key:**

***I - Introduce***
***C – Cover to some extent***
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| **IFT Core Competencies** | Basic Food Production | Introduction to Food Science | Food Sensory Evaluation | Methods of Food Processing (meat , dairy, fruits …) | Professional Seminar | Methods of Food and Nutrition Analysis/Laboratory | Food Microbiology | Food Chemistry | Food Process Engineering Technology | Product Research innovation and Sensory Evaluation | Seminar in Food Science |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Food Chemistry and Analysis*** | HOMT 0314 | FOSC 0301 | FOSC 0302 | FOSC 0403 | NUSC 0501 | FOSC 0405/406 | FOSC 0407 | FOS C 0410 | FOS C 0471 | FOS C 0473 | FOSC 0400 |
| know the chemistry underlying the properties and reactions of various food components | C, 1 | C, 1, 2 | | C, 1 | | D, 1, 2, 3, 4, 5 | C, 1 | D, 1, 2, 3, 4, 5 | | C, 1 | C, 1 |
| Have sufficient knowledge of food chemistry to control reactions in foods | C | C, 1, 2 | | C, 1 | | D, 1, 2, 3, 4, 5 | | D, 1, 2, 3, 4, 5 | | C, 1 | C, 1 |
| Know the major chemical reactions that limit shelf life of foods | C | C, 1, 2 | | D, 1, 2, 3, 4, 5 | | C, 1 | C, 1 | D, 1, 2, 3, 4, 5 | | | |
| Use the laboratory techniques common to basic and applied food chemistry | C | C, 1 | | C, 1 | | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | | D, 1, 2, 3, 4, 5 | |
| Know the principles behind analytical techniques associated with food | C | | | C, 1 | | D, 1, 2, 3, 4, 5 | | C, 1 | | | |
| Be able to select the appropriate analytical technique when presented with a practical problem | C | C, 1 | | C, 1 | | D, 1, 2, 3, 4, 5 | | C, 1 | | D, 1, 2, 3, 4, 5 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Demonstrate practical proficiency in food analysis laboratory | C | I , 1 | | C, I | | D, 1, 2, 3, 4, 5 | C, 1 | D, 1, 2, 3, 4, 5 | | | |
| ***Food Safety and Microbiology*** | | | | | | | | | | | |
| Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow | C | C, 1 | | I | | | D, 1, 2, 3, 4, 5 | | C, 1 | | |
| Identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods | C | C, 1, 2 | | I | | | D, 1, 2, 3, 4, 5 | | C, 1 | | |
| Utilize laboratory techniques to identify microorganisms in foods | C | I | | I | | | D, 1, 2, 3, 4, 5 | | | | |
| Know the principles involving food preservation via fermentation processes | C | D, 1 | | 1, 2, 3, 4 | | | D, 1, 2, 3, 4, 5 | C, 1 | | | |
| Know the role and significance of microbial inactivation, adaptation and environmental factors (i.e., Aw, pH, temperature) on growth and response of microorganisms in various environments | C | D,6 | | I | | | D, 1, 2, 3, 4, 5 | | D, 1, 2, 3, 4, 5 | | |
| Identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods | | D, 1 | | 1, 2, 3, 4 | | | D, 1, 2, 3, 4, 5 | | I | | |
| ***Food Processing and Engineering*** | | | | | | | | | | | |
| Know the source and variability of raw food material and their impact on food processing operations | C | C | I | I | | | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | C, 1 | C, 1 |
| Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage | C | C, 1 | | 1, 2, 3, 4 | | | D, 1, 2, 3, 4, 5 | | C, 1 | | |
| Know the principles that make a food product safe for consumption | C, 1 | C, 1 | | 1, 2, 3, 4 | | | D | | C, 1 | | |
| Know the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings | C | I, 1 | | I | | | | | D, 1, 2, 3, 4, 5 | | |
| Be able to use the mass and energy balances for a given food process | C | I, 1 | | I | | | | | D, 1, 2, 3, 4, 5 | | |
| Know the unit operations required to produce a given food product | C | I, 1 | | I | | | | | D | | |
| Know the principles and current practices of processing techniques and the effects of processing parameters on product quality | C | I, 1 | I | 1, 2, 3, 4 | | C, 1 | C, 1 | C, 1 | D, 1, 2, 3, 4, 5 | | |
| Know the properties and uses of various packaging materials | C | C, 1 | I | 1, 2, 3, 4 | | C, 1 | C, 1 | I, 1 | D, 1, 2, 3, 4, 5 | | |
| Know the basic principles and practices of cleaning and sanitation in food processing operations | C, 1 | C, 1 | I | 1, 2, 3. 4 | | | D, 1, 2, 3, 4, 5 | | C, 1 | | |
| Know the requirements for water utilization and waste management in food and food processing | C | C | I | 1, 2, 3, 4 | | | I, 1, 2 | | C, 1 | | |
| ***Applied Food Science*** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Be able to apply and incorporate the principles of Food Science in practical, real-world situations and problems | C, 1 | C, 12 | I | 1 | | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | |
| Know how to use computers to solve Food Science problems | C | C | 1, 2, 3, 4 | I | | D, 1, 2, 3, 4, 5 | C, 1 | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | |
| Be able to apply statistical principles to Food Science applications | C | C | I | I | | D, 1, 2, 3, 4, 5 | C, 1 | | | D, 1, 2, 3, 4, 5 | |
| Be able to apply the principles of Food Science to control and assure the quality of food products | C | C, 1 | 1, 2, 3, 4 | 1, 2, 3, 4 | | I, 1 | C, 1 | C, 1 | | D, 1, 2, 3, 4, 5 | |
| ***Success Skills*** | | | | | | | | | | | |
| Demonstrate the use of oral and written communication skills. This includes such skills as writing technical reports, letters and memos; communicating technical information to a non-technical audience; and making formal and informal presentations | C | D, 1, 2, 3, 4, 5 | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Be able to develop a process for solving and preventing reoccurrence of ill-defined problems; know how to use library and internet resources to search for quality information, and solve a problem; and make thoughtful recommendations | C | C | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Apply critical thinking skills to new situations | C, 1, 2 | C, 1, 2 | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Commit to the highest standards of professional integrity and ethical values | C, 1, 2 | C, 1, 2 | 1, 2, 3, 4 | I | 1, 2, 3, 4 | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Work and/or interact with individuals from diverse cultures | C, 1, 2 | C, 1 | I | I | 1, 2, 3, 4, 5 | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Explain the skills necessary to continually educate oneself | C, 1, 2 | | 1, 2, 3, 4 | | | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Work effectively with others | C, 1, 2, 3 | C, 1 | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4, 5 | C, 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Provide leadership in a variety of situations | C, 1, 2, 3 | C | I | 1, 2, 3, 4 | 1, 2, 3 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Deal with individual and/or group conflict | C, 1, 2, 3 | C | I | 1, 2, 3, 4 | 1, 2, 3 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Independently research scientific and nonscientific information | C | C, 1 | 1, 2, 3, 4 | I | 1, 2 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Competently use library resources | C | D, 1, 2, 3, 4 | 1, 2, 3, 4 | I | 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Manage time effectively | C, 1, 2, 3 | | 1, 2, 3, 4 | 1, 2, 3, 4 | 1 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Know how to facilitate group projects as well as be a good team member | C, 1, 2, 3 | D, 1, 2, 3, 4, 5 | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |
| Handle multiple tasks and pressures | C, 1, 2, 3 | D, 1, 2, 3, 4, 5 | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 | D, 1, 2, 3, 4, 5 |