Format revised 2025
Syllabus revised in 2025

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SCHOOL OF FOOD AND WINE STUDIES
DEPARTMENT OF BAKING AND PASTRY
COURSE TITLE: CREATIVE RECIPE DEVELOPMENT AND PRODUCTION
COURSE CODE: FWBPRD670
3 semester credits

1. DESCRIPTION

Creating original and innovative recipes is one of the main goals of a professional pastry chef. New recipes need to meet market needs, and pastry chefs must be able to understand trends as well as develop a personal style. The aim of this course is to provide students with the instruments to develop new and innovative recipes. Creativity is not only a matter of new ideas: new recipes need knowledge of the basic ingredients and how they can be combined, besides the standard classic applications. Students will approach the basics of food pairing, a branch of culinary science used by most professionals today in order to broaden the possible flavor combinations. This course provides students with a solid knowledge of the chemistry behind single preparations, whether traditional or contemporary. Through the lectures, students will be guided into a new perspective of ingredients and their interaction.

This course consists of experiential learning hours with our Community Engagement Member Institutions (CEMI). CEMI are dynamic learning environments created to foster learning through a structured interaction with the community. In addition to regular lecture hours, students will be involved in learning by doing through real projects and integration with the local population and territory in order to remove cultural and learning barriers as well as to develop a strong likelihood for success in life. The experiential learning hours are fully supervised by instructors who track students step by step during their learning experience, monitor and advise according to student needs, and support student initiative. This unique learning model allows students to benefit from an all-encompassing educational experience based on theory and practice in real enterprises, learning of comprehensive operational processes, problem-solving, leadership, and management.

2. OBJECTIVES

The aim of this course is to open new perspectives on the creation of desserts. Students will have the opportunity to understand how recipe formulas can be adapted to achieve the desired final result. The course will offer a focus on food pairing, on the concept of creativity, and on how the idea that the preparation process can be as important as the dessert itself. Upon successful completion of this course, students will be able to:

- Identify the factors affecting the creative process
- Understand how knowledge and curiosity can be a good starting point when creating new recipes
- Become confident with the modern concept of food pairing as the basis of new flavor combinations
- Understand the approach to balancing formula modification

- Learn new technical approaches to creaming and foaming methods
- Become confident with the application of lecithin to substitute eggs and sugar in classic pastry preparations
- Become confident with the application of alternative sugars and starches in the preparation of custards
- Understand the effects of alternative fats in curd preparation• Learn how to apply legume starches both as thickeners and as foam emulsifying agents
- Learn how to apply modern hydrocolloids for the production of egg-free or vegan mousses
- Learn how to produce homemade yoghurt and fresh cheese
- Learn how to pair beer with desserts
- Understand the potential of beer application in pastry recipes

3. REQUIREMENTS

Master Italian Pastry Arts II or equivalent.

4. METHOD

This course consists of lectures, class discussions, and projects. Mediums for instruction used may include but are not limited to, interactive and hands-on activities which challenge thought processes, academic texts and studies, videos, slides, guided problem solving, and experiential and/or field learning activities where applicable.

5. TEXTBOOK – FURTHER READINGS – RESOURCES

TEXTBOOK (Copy available at the university library):

On Food and Cooking: the Science and Lore of the Kitchen - H. McGee - Hodder & Stoughton
The Flavor Matrix - James Briscione with Brooke Parkhurst - HMHCO 2018
Gastrophysics. The New Science of Eating - Spence - Penguin Random House - 2017
The Perfect Meal - Spence, Piqueras-Fiszman - Wiley 2014

The textbook is mandatory for course participation and completion. Where applicable additional materials may be provided by the instructor.

FURTHER READINGS

Bouty, Isabelle & Gomez, Marie Ieandre. “Creativity in Haute Cuisine: Strategic Knowledge and Practice in Gourmet Kitchens,” in Journal of Culinary Science and Technology, 11(1), 2013.
Dorfler, Victor et al. “Creativity and Innovation in Haute Cuisine: Towards a Systemic Model,” in Creativity and Innovation Management , 23(1), 2014.
Horng, Jeou-Shyang & Hu, Meng-Lei Monica “The Mystery in the Kitchen: Culinary Creativity,” in Creativity Research Journal , 20(2), 2008.

LIBRARY

Course participants may access the campus library. Please consult the library site for resources such as collections, borrowing, scanning and wifi connection, and research:
https://www.auf-florence.org/Library/the-library/

6. COURSE MATERIALS

(NOTE: STUDENTS MUST ALSO ADHERE TO KITCHEN RULES OUTLINED IN THE CEMI BOOKLET)

1. All students are strictly required to attend class wearing a clean uniform: the jacket provided by the institution, black pants, apron (color depending on the CA level), safety footwear, a white Chef's hat, and a set of knives. Students with long hair should tie hair back before wearing the hat. Students are not allowed to wear rings, earrings or any other visible piercings, bracelets, watches, and nail polish during lab hours. Students who are not dressed properly will not be allowed in class.
2. All students must attend class fully prepared and on time. Late students will not be accepted.
3. Carefully wash hands at the beginning of each class, before food is handled.
4. During professional cooking classes only small food tastings are allowed as the main purpose of these courses is to develop technical skills. Students are not allowed to take food out of the kitchen.
5. Students are also required to participate in a polite and responsible way. Students are not allowed to sit on the working stations. Students who disturb lessons or are disrespectful to the instructor or the other students will be asked to leave the class. Serious infractions will be evaluated by the Academic Office.
6. Cooking classes will include various tasks which all students must carry out. Classes will include all different types of recipes and students are expected to actively participate in all lessons regardless of personal likes or dislikes.
7. Each student is responsible for washing all utensils used during class and keeping the working station clean and tidy, with all the utensils as listed in the station inventory. Two students at a time will tidy up the kitchen common areas during each class.
8. Students are responsible for kitchen utensils and maintenance of the equipment. The cost of a) any missing utensil b) damages due to student carelessness will be shared by all students.
9. No visits are allowed in class at any time.
10. The use of cellular phones is not allowed within the school building.

Should students wish to store materials or equipment, lockers are available with a deposit (given back after returning the key).

7. COURSE FEES

Course fees cover course-related field learning activities, visits, and support the instructor's teaching methodologies. Book costs are not included in the course fee. The exact amount will be communicated by the instructor on the first day of class.

8. GRADING AND EVALUATION & ATTENDANCE

10% Attendance
30% Class Participation and Assignments
20% Midterm Exam, Field Learning project (if applicable), Special/Research Project (if applicable), Practical Performance (if applicable)
20% Final Exam
20% Paper/Project

The above grade breakdown percentages reflect the grading scale standards in the "Grading and Evaluation System" section of the catalog.

Attendance

Class participation is mandatory. Based on the hours defined in the Academic Catalog's attendance policy, students may miss up to 2 class encounters delivered as lecture hours. A third absence

constitutes a course failure.

Please note that absence hours may vary according to the learning methodology, as per the academic catalog policy on credit hours:
https://catalog.auf-florence.org/standard_regulation

9. EXAMS / PROJECTS / ASSIGNMENTS

Final Exam: The final exam is divided into two sections:

- Part I: written test
- Part II: hands-on performance

The written test is divided into three sections:

- Part I: 10 Multiple choice questions. Each correct answer is worth 2 points, for a total of 20 points.
- Part II: 10 short-answer questions. Each correct and complete answer (concise explanations, main ideas, key words, names, etc.) is worth 5 points, for a total 50 points.
- Part III: two essay questions; each correct and complete answer is worth 15 points (based on content, vocabulary, detail, etc.) for a total of 30 points.

No pencil allowed. Blue and black pens only.
Further details (guidelines, grading rubric,…) are provided in the course portal.

The final exam is cumulative and will account for the 20% of the final grade breakdown.
The time and date of the exam cannot be changed for any reason.

Final Project: The final project accounts for 20% of the final course grade. The project details will be assigned on the first day of class.

Assignments: This course requires at least 3 assignments as per the course outline in the syllabus.

Assignment #1: Trend Analysis & Market Needs Report
Assignment #2: Ingredient Interaction & Food-Pairing Analysis
Assignment #3: Conceptual Recipe Innovation Proposal

Further details, guidelines, and deadlines are provided in the course portal.

10. COURSE OUTLINE

1. Introduction to the course
Course description
Review of single ingredients: chemical structure, interaction and purpose in the recipe-Definition and guidelines for balancing formulas-Creative recipe development-Planning a new recipe: food cost evaluation and marketing strategies - Packaging -Evaluating ingredients and desserts composition

1.1 Food pairing
The chemistry behind flavor combinations – Scientific analysis of the compatibility between different ingredients - Approach a matter in constant evolution and understand how science can

explain the reasons behind perfect food combinations

1.2 The Perfect Meal

Review of the main culinary movements of the last century: what comes after modernist cuisine? The taste of expectation: the multisensory experience and cuisine - Cooking as a multisensual art - Food perception, description, experience

Readings
On Food and Cooking pp. 21-51 / 69-87 / 92-113 / 464 / 652 / 667 / 677 / 682 / 694-712-The Flavor Matrix - Part I: Introduction pp. 2-15 / Part III: Inspiration pp. 252- 298-The Perfect Meal: Introduction pp. 1-25 / The art and science of food description Ch.3 / Multisensory perception of flavor Ch. 6

2. New perspectives on creaming methods 1

2.1 Short-crust pastry balancing formulas

Control of air and gluten development: two-step flour application
Reduction of processing time to control ingredient temperature
Chocolate short crust: balancing water content

2.2 Contemporary creaming method in cake preparation

Changing the rules of mixing methods: leavening agent combination
Features of different leavening agents: baking powder, baking soda, and cream of tartar - Impact of leavening agents on the structure and flavor of a cake

Comparison among classic and contemporary short crust applications - Pan di Banana

Readings
On Food and Cooking pp. 521-524/797-802

3. Cake batter balancing formulas: nut paste application

Substituting butter with nut paste: impact on flavor and structure
Fat temperature control - The nutritional value of nuts

Cherry & Fig Cake - Peach & Disaronno Cake

Readings
On Food and Cooking pp. 501-512

4. Lecithin application in sponge cakes

Sources of lecithin - Lecithin as a binder in foaming methods

4.1 Soy lecithin application to fresh fruit-based sponge cakes: hot emulsion
4.2 Lecithin content in legumes
4.3 Replacing a percentage of egg with chocolate: impact on texture and pliability
4.4 Delay of sugar recrystallization: difference between a sugar & butter and a sugar & chocolate combination

White, milk, dark chocolate sponge cake - Chickpea water and vegetable

spongecake - Seasonal fruit spongecake

Readings
On food and Cooking pp. 38 / 50 / 76 / 259

5. Alternative sugars and starches in custards

5.1 Advantages of fructose and glucose: water-binding effect, improvement in creaminess, better resistance to freezing

5.2 Features of honey as an alternative to sugar: providing and balancing acidity, adding creaminess, helping to retain moisture

5.3 Dextrose features: low humidity and low sweetening power - Dextrose application

5.4 Starches

- Tapioca starch application as a substitute to eggs in a pastry cream
- Rice starch in combination with honey to increase smoothness
- Potato starch and dextrose-based pastry cream: working with low temperatures

Fructose pastry cream - Tapioca pastry cream
Potato starch pastry cream - Rice starch and honey pastry cream

Readings
On Food and Cooking pp. 93-100 / 305 / 615 / 655-677

6. Curd variations

6.1 Cocoa butter VS butter

Cocoa butter potential for flavor absorption
Flavoring combination techniques: temperature control for cocoa butter emulsion
Cocoa butter for a firm and creamy structure
Cocoa butter as a binder for egg white and fruit juice-Legume based-curds

6.2 Thickening curds with legume starches: for flavor, for texture, for special requirements

Chocolate tart with cocoa butter and lemon curd - Green-pea and mint curd tart with goat's cheese

Readings
On food and Cooking pp. 19-20 / 93-100 / 702

7. Application of modern hydrocolloids for contemporary mousse production

Jellified & plant-based mousses-Features and suitable application of carrageenan
Application of hydrocolloids for contemporary mousse production
Application of gelatin and carrageenan to incorporate air into emulsions
Application of modern thickening and gelling agents in the production of mousses

Dark chocolate mousse, red fruit tea and tonka bean
Beetroot supreme with legume spongecake

8. Changing texture - Puffed and sandy cereals

Concept of *popping* and *puffing*

Pastry application of puffed/popped cereals
Suitable grains for puffing/popping
Survey of puffed grains and methods: hot air, sand roasting, frying oil, microwave
Sandy cereals production: tips for a light and stable coating

Puffed rice – Puffed farro – Sandy barley – Sandy farro

9. Yoghurt and fresh cheese production

9.1 House-made yoghurt production

Fermented dairy product chemistry
Possible application of carrageenan to increase density
Safety and sanitation: professional equipment

9.2 Producing fresh cheese: production steps and chemistry of milk curdling
Fresh cheese application to pastry: using acidity to balance and add complexity
Cheese flavor development thanks to salt

Whole milk yoghurt – Skimmed milk yoghurt – Raviggiolo cheese

10. Beer in pastry creations

10.1 World beer styles and sensory analysis - Microbreweries
History of beer consumption and contemporary trends
10.2 Beer ingredients and fermentation: production process
10.3 Application of beer in cake and dessert production: effects of bitterness on the final flavor
Focus on stouts and lambic styles
10.4 Definition and diffusion of "pastry beers"

Beer pastry cream – Lambic and chocolate "double" mousse - Guinness torte

Readings
Brewer Association, A Brief Beer & Food Matching Chart . Available online.
Bottleneck Management, Beer and Food Pairing Chart . Available online.

Learning Outcomes

- Explain the chemical behavior of ingredients during mixing and cooking.
- Balance formulas by understanding interactions, ratios, and functional roles.
- Apply multisensory principles and contemporary gastrophysics to flavor design.
- Integrate cost control, marketing factors, and packaging choices into product strategy.
- Evaluate how these variables shape the commercial performance of a pastry operation.
- Produce shortcrusts with controlled gluten development and optimized texture.
- Assess the impact of mixing methods and leavening agents on structure and rise.
- Select alternative fats and manage butter temperature for optimal aroma absorption.

- Use nuts and lecithin as functional ingredients in advanced pastry applications.
- Apply lecithin, chocolate, and fruit purées to create stable, innovative sponges.
- Formulate alternative pastry creams using varied sugars and starches.
- Emulsify cocoa butter in curds and manage fat–water interactions.
- Use legumes and vegetable starches to meet structural and dietary requirements.
- Produce fat-free or low-fat mousses using modern hydrocolloids.
- Justify hydrocolloid selection (including carrageenan) based on desired texture.
- Apply puffed, popped, and sanded cereals to enhance texture complexity.
- Produce yogurt and explain the roles of enzymes, rennet, and lactic acid bacteria.
- Incorporate fermented dairy to enrich dessert profiles.
- Use beer's bitterness, aroma, and fermentation profile in pastry preparations.
- Identify beer styles suitable for pairing and recipe development.