Haldia Institute of Technology

Department of Food Technology

COURSE INFORMATION

**Course Code: FT-603**

**Course Name: Bakery, Confectionary and Extruded foods.**

**Contacts: 3 (L) per week**

**Credits: 4**

COURSE OUTCOME

**At the end of this course, the incumbent will be able to:**

**FT603.1**Ability to understand the **basics** of Bakery, confectionary & Extruded Food products.

**FT603.2** Ability to understand different **raw materials used** and their **testing** methods of Bakery products.

**FT603.3** Ability to understand different **line or flow diagrams** for different bakery, confectionary and extruded products processing operations.

**FT603.4** Ability to **cope up with modern bakery products processing (eg. Biscuit, bread etc.) Operations** as well as Confectionary and modern extruded products (third generation products, 3X) and their techniques already implemented.

**FT603.5** Ability to understand to maintain **bakery hygiene**, bakery processing laws & ethics and prevent food processing hazards.

**FT603.6** Ability to **understand** and **apply** knowledge (hygiene) on laws and regulations related to bakery foods and also ability to **function** effectively as an individual, and as a member or leader in diverse teams in multi-disciplinary settings, and to **develop** buddingentrepreneurs.

PREREQUISITES

**To understand this course, the incumbentmust have idea of:**

* Elementary chemistry
* Food processing / Engineering

SYLLABI

**Module I (8L)**: Introduction to baking; Bakery ingredients and their functions; Machines and equipment for batch and continuous processing ofbakery products.

**Module II (8L)**: Testing of flour; Manufacture of bread, cake and biscuits; Analysis of

Bakeryproducts; Cake icing techniques, wafer manufacture, cookies, crackers, dusting or breading.

**Module III (8L)**: Manufacture of bread rolls, sweet yeast dough products, cake specialties,pies andpastries, doughnuts, chocolates and candies; Coating or enrobing of Chocolate(including pan-coating); Maintenance, safety and hygiene ofbakery plants.

**Module IV (8L)**: Importance and applications of extrusion in food processing; Pre and

Post extrusion treatments; Manufacturing process ofextruded products; Change of functionalproperties of food components during extrusion.

**Revision: 4L**

BEYOND SYLLABI COVERAGE

Industrial visit for any bakery plant.

Identification of all Bakery products, Confectionaries and extruded food products.

LECTURE PLAN

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| **LectureNo.** | **Details of coverage** | **Handout, Lecture Notes, Links etc.** |
| 1 | Significance of this course, syllabus discussed. | [Lecture Note1](Lecture%20Note.pdf) |
| 2 | Introduction to Bakery, Reasons for the selection of wheat crops as the primary raw material in bakery. Types of wheat according to their botanical name. Structure (basic) of wheat grain. The nutrients present in Endosperm, Bran, Germ and their presence of comparison.  | Bakery Science and Cereal Technology; Neelam Khetrapaul, Raj Grewal, Sudesh Jood, Daya publication. |
| 3 | Milling: Introduction and compare between stone and mechanical milling. Different types of flour which are produced from wheat, maize, oat, millet, rye, rice, barley. | -----Do----- |
| 4 | Water absorption capacity (WAC). Its usefulness and dependent factors. Strong & weak wheat grain and hence weak and strong flour. Gluten: its quality and quantity in flour dough.  | -----Do----- (+) class notes |
| 5 | Testing of flour: Different testing of wheat flour, qualitative and quantitative analysis.  | Class notes |
| **6** | Testing of flour: Different testing of wheat flour, qualitative and quantitative analysis.  | -----Do----- |
| **7** | Testing of flour: Different testing of wheat flour, qualitative and quantitative analysis.  | -----Do----- |  |
| **8** | Different ingredients used in bakery industries and their roles / functions / uses. | Bakery Science and Cereal Technology; Neelam Khetrapaul, Raj Grewal, Sudesh Jood, Daya publication. |
| **9** | Different ingredients used in bakery industries and their roles / functions / uses. | -----Do----- |
| **10** | Different ingredients used in bakery industries and their roles / functions / uses. | -----Do----- |
| **11** | Biscuit: Types (ISI). Short and hard dough biscuits. Manufacture of biscuit with described steps and neat flow diagram.  | Bakery Technology & Engineering; Matz SA; 1960; AVI Pub. (+) ***Class Notes.*** |
| **12** | Mixing procedures of biscuit dough and mixers used in bakery plant. Cream-cracker biscuit manufacturing.  | -----Do----- |
| **13** | Baking oven: Different types, baking zones. | -----Do----- |
| **14** | Role of baking oven zones. Mode of heat transfer. Oven fuels. | -----Do----- |
| **15** | Cookie: Defination. Different types. Manufacture, faults and care to be taken during processing. | -----Do----- |
| **16** | Bread: Introduction. Different types of bread manufacturing. Importance of the role of salt. | Bakery Science and Cereal Technology; Neelam Khetrapaul, Raj Grewal, Sudesh Jood, Daya publication. |
| **17** | Different ingredients require for bread manufacturing. Selection of flour. Different steps for bread manufacturing and their importance. | -----Do----- |
| **18** | Cake: Introduction. Different ingredients used. Their important roles. Selection of flour.  | -----Do-----, Class notes |
| **19** | Different methods of manufacturing of cake (sugar batter and flour batter method). | -----Do-----, Class notes |
| **20** | Faults in cake making. Cake icing (different methods). | -----Do-----, Class notes |
| **21** | Pastry: Introduction. Different methods of pastry manufacturing. Faults in pastry making. | -----Do-----, Class notes |
| **22** | Wafer: Ingredients required. Selection of flour. Manufacturing process. | -----Do-----, Class notes |
| **23** | Doughnuts: Introduction. Types. Selection of flour. Different ingredients. Manufacturing process. Selection of frying oil. Care to be taken during processing of doughnuts. | -----Do-----, Class notes |
| **24** | Pie: Introduction. Selection of flour. Different ingredients used. Manufacturing process. Different faults in pie. | -----Do-----, Class notes |
| **25** | Analysis of Bakery products: Analysis of Biscuits | Class notes |
| **26** | Analysis of Bakery products: Analysis of Bread. | -----Do----- |
| **27** | Maintenance of Bakery plants. | Bakery Science and Cereal Technology; Neelam Khetrapaul, Raj Grewal, Sudesh Jood, Daya publication. |
| **28** | Safety and hygiene to maintain in bakery plants. | -----Do----- |
| **29** | Confectionary: Introduction to candies: Crystalline and non-crystalline candies.  | Website |
| **30** | Mechanism of formation. Dependent factors. Comparison between crystalline and non-crystalline candies. | Class notes |
| **31** | Introduction to Chocolates: Types, Manufacturing processes (steps). | -----Do----- |
| **32** | Manufacturing process of chocolates (detail: steps), Care to be taken during processing. | -----Do----- |
| **33** | Introduction to extrusion | Notes |
| **34** | Advantages and disadvantages of extrusion. | -----Do----- |
| **35** | Introduction to extruder: Single screw extruder. | -----Do----- |
| **36** | Different parts and zones present in a single screw extruder (**SSE**) and their roles / functions. | -----Do----- |
| **37** | Double screw extruder (**DSE**): Introduction, their types. Compare between **SSE**&**DSE**. Pre and post extrusion treatments | -----Do----- |
| **38** | Manufacturing process of few extruded products | -----Do----- |
| **39** | Change of functionalproperties of food components during extrusion. | -----Do----- |
| **40** | Revision on Bakery | From previous years Semester Question papers. |
| **41** | Revision on Confectionary and Extrusion / extruder. | -----Do----- |
| \*Minimum 36 lectures for 3 contact courses and 48 lectures for 4 contact courses |

RECOMMENDED READINGS

**TEXT**

1. Bakery Technology & Engineering; Matz SA; 1960; AVI Pub.
2. Bakery Science and Cereal Technology; Neelam Khetrapaul, Raj Grewal, Sudesh Jood, Daya publication.

**REFERENCE**

1. Up to-date Bread Making; Fance WJ & Wrogg BH; 1968, Maclasen & Sons Ltd.
2. Modern Cereal Chemistry; Kent-Jones DW & Amos AJ; 1967, Food Trade Press Ltd.
3. Extrusion of Food, Vol 2; Harper JM; 1981, CRC Press.