GUJARAT TECHNOLOGICAL UNIVERSITY

FOOD PROCESSING & TECHNOLOGY (14)
TECHNOLOGY OF CEREALS PULSES AND OIL SEEDS

SUBJECT CODE: 2151408
B.E. 5th SEMESTER

Type of course: Food Processing Technology

Prerequisite: Nil

Rationale: To acquaint with production trends, structure, composition, quality evaluation and processing technologies for product development and value addition of various cereals, pulses and oilseeds.

Teaching and Examination Scheme:

<table>
<thead>
<tr>
<th>Teaching Scheme</th>
<th>Credits</th>
<th>Examination Marks</th>
<th>Total Marks</th>
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Content:

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<thead>
<tr>
<th>Sr. No.</th>
<th>Content</th>
<th>Total Hrs</th>
<th>% Weightage</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Food Grains: Production trends, structure and chemical composition of cereals, pulses and oilseeds. Supply chain of food grains, physico-chemical properties of food grains.</td>
<td>6</td>
<td>12</td>
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<td>2</td>
<td>Legumes Processing: Pretreatment of pulses for milling, Methods of milling of pulses, Factors affecting milling of pulses, Pulse based processed products.</td>
<td>8</td>
<td>16</td>
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<td>3</td>
<td>Oilseeds Processing for Oil Extraction: Preparation of oilseeds, Mechanical and Solvent extraction methods of oil extraction, Oil refining, hydrogenation, Utilization of deoiled cake.</td>
<td>8</td>
<td>16</td>
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<td>4</td>
<td>Processing of Wheat: Wheat classification, Structure of wheat grain, Wheat milling- basic concepts, products and by-products, Flour milling, Turbo grinding and air-classification, Flour grades and their suitability for baking purposes.</td>
<td>10</td>
<td>20</td>
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<td>5</td>
<td>Paddy milling: Milling of Paddy- basic concepts, traditional and modern methods of milling, Parboiling techniques.</td>
<td>12</td>
<td>24</td>
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<td>6</td>
<td>Corn milling: Dry and wet milling of corn, corn starch and its conversion products.</td>
<td>6</td>
<td>12</td>
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Suggested Specification table with Marks (Theory):

<table>
<thead>
<tr>
<th>Distribution of Theory Marks</th>
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<tbody>
<tr>
<td>R Level</td>
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<tr>
<td>18</td>
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</tbody>
</table>

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom’s Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.
Reference Books:
1. Corn: Chemistry and Technology by Watson SA & Ramstad PE., AACC
2. Unit Operations of Agricultural Processing by K.M. Singh and K.K. Sahay
3. Manuals on Rice and its processing by CFTRI Mysore and IIT Kharagpur.
7. Bakery Technology and Engineering by Matz SA.CBS Publication

Course Outcome:
At the end of this module, the student will be able to:
1. Understand the basic composition and structural parts of food grains.
2. Aware the importance of physico-chemical properties of food grains
3. Understand the basics of milling operations for food grains
4. Identify the problems associated with milling of grains and their solution.
5. Know processing food grains into value added products

List of Practical:
1. To study the physico-chemical properties of food grains
2. Preparation of malt
3. Determination of glutent content in wheat flour
4. To study the cooking quality of rice using water up takes method.
5. To study the methods of extraction of oil from oilseeds
6. Determination of under milled grains from polished rice
7. Preparation of quick cooked rice
8. Determination of Angle of Repose of grains
10. Parboiling of paddy

Open Ended Problems

The content in this subject would be useful to develop insight and application based knowledge among students

To know the composition of major food grains. How to evaluate the quality of grains. To determine the physico-chemical properties of grains and to know their importance. To know the processing technologies for food grains for value addition. How to extract the oil from oil seeds by various methods

Major Equipments

Grain dryer
Specific gravity separator
Cyclone separator
Sieve shaker
Water bath
Angle of repose equipment
Mini oil expeller
Mini dal mill
List of Open Source Software/learning website

a.  www.cftri.com/milling.html
b.  www.iicpt.edu.in

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.