

# 16AG201 ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS AND FOOD QUALITY

Hours Per Week :

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

Total Hours :

| L  | T | P | WA/RA | SSH/HSB | CS | SA | S | BS |
|----|---|---|-------|---------|----|----|---|----|
| 45 | - | - | 5     | 40      | 4  | 4  | 5 | -  |

## Course Description and Objectives:

This course gives an insight into the properties of different food materials and their quality standards. The objective of this course is to make the students understand the basic properties of food materials and enable them to process, preserve and use them for various applications.

## Course Outcomes:

The student will be able to :

- understand the basic properties of food materials.
- apply the properties on industrial scale.
- acquire basic knowledge about food laws.
- apply the food laws in different industries.

## SKILLS:

- ✓ *Measure engineering properties of food for the application of various designs in food industry.*
- ✓ *Analyze the food product available in the market based upon its quality standards.*



**ACTIVITIES:**

- o *Hazard analysis of processed products using pilot scale food manufacturing.*
- o *Quality assessment of various food products by considering existing laws.*
- o *Estimation of a few engineering properties of different regional crops.*

**UNIT - 1****L-09**

**PHYSICAL AND THERMAL PROPERTIES:** Importance of engineering properties of biological materials, Study of different physical and thermal characteristics of important biological materials like shape, size, volume, density, roundness, sphericity, surface area, specific heat, thermal conductivity, thermal diffusivity, etc.

**UNIT - 2****L-09**

**RHEOLOGICAL AND AERODYNAMIC PROPERTIES:** Measurement of colour, Flavour, Consistency, Viscosity, Texture and their relationship with food quality and composition; Rheological characteristics like stress, strain time effects, Rheological models and their equations, Aerodynamic characteristics and frictional properties.

**UNIT - 3****L-09**

**APPLICATIONS OF ENGINEERING PROPERTIES:** Application of engineering properties in handling processing machines and storage structures, Concept, Objectives and need of quality, Quality control, Methods of quality control, Sampling.

**UNIT - 4****L-09**

**QUALITY CONTROL AND ASSURANCE:** Purpose, Sampling techniques, Requirements and sampling procedures for liquid, Powdered and granular materials, Sensory quality control, Panel selection methods, Interpretation of sensory results in statistical quality control, TQM and TQC, Consumer preferences and acceptance.

**UNIT - 5****L-09**

**FOOD LAWS:** Food Laws and Regulations in India, Food grades and standards like BIS, AGMARK, PFA, FPO, CAC (Codex Alimentarius Commission), Sanitation in food industry, GMP, HACCP (Hazard analysis and critical control point) and ISO 9000 Series.

**TEXT BOOKS:**

1. G. G. Birch and K. J. Paiker, "Control of Food Quality and Food Analysis", Elsevier Applied Science, 1990.
2. M.A. Rao and S.S.H Rizvi, "Engineering Properties of Foods", 4<sup>th</sup> edition, CRC Press, 2014.

**REFERENCE BOOKS:**

1. O.P. Singhal and D.V.K. Samuel, "Engineering Properties of Biological Materials", Saroj Prakashan, Allahabad, 2003.
2. S.N. Herschdorfer, "Quality Control in Food Industry", Academic Press Inc., 1980.
3. N. N. Mohsenin, "Electromagnetic Radiation Properties of Food and Agricultural Products", Gordon and Breach Publishers Inc, UK, 1984.

**WEB LINK:**

1. [http://ecourses.iasri.res.in/email\\_authentication.aspx?Degree\\_Id=04](http://ecourses.iasri.res.in/email_authentication.aspx?Degree_Id=04)