17FT024 LIPID SCIENCE AND TECHNOLOGY

Hours Per Week :

L	T	P	C
3	1	-	4

Total Hours :

L	T	P
45	15	-

WA/RA	SSH/HSH	CS	SA	S	BS
15	30	-	5	5	-

Course Description and Objectives:

This course deals with Lipid chemistry and characterization; processing of fats and oils; food applications; biobased applications; overview of lipid's role in health and nutrition. By the end of the semester students will be able to understnd lipid type, sources, structure, properties and food and non-food usage; lipid metabolisms and biotechnology; as well as lipid bioproducts and industrial processing technologies.

Course Outcomes:

The student will be able to:

- To develop a working knowledge of basic lipid chemistry, sources of fats and oils, refining of fats and oils, food and biobased industrial applications.
- To use additional resources for information gathering and critical review.
- To demonstrate scientific and creative proficiencies to solve practical problems associated with lipids.

SKILLS:

- ✓ Judge the quality of products formed during frying.
- ✓ Predict the physiochemical changes during frying of foods.
- .✓ Measurement of flavour emulsions and their stability

UNIT-I

Nutritional aspects of food lipids and their sources– omega-3 and omega- 6 fatty acids and their significance, Phytosterols and their nutraceutical significance.

UNIT-II

Measurement of lipid degradation parameters during deep-fat frying and storage of foods. Flavour emulsions and their stability.

UNIT-III

Fat powders like cream, butter, cod-liver oil etc. and techniques involved such as micro encapsulation, Fat substitutes based on carbohydrates and proteins.

UNIT-IV

Formulation and characterization of low-fat spreads, whipped creams, margarines, mayonnaise, salad dressings etc. Bakery shortenings chemistry, formulation and technology. Alternative fats, low fat substitutes.

UNIT – V

Trans-fatty acids- formation during processing and nutritional aspects, Enzymatic approach to tailor made fats.

TEXT BOOKS:

1. Akoh CC. 2005. Handbook of Functional Lipids. Taylor & Francis.
2. Dutta PC. 2004. Phytosterols as Functional Food Components and Nutraceuticals. Marcel Dekker.
3. Garti N & Kiyotaka S.2001. Crystallization Processes in Fats and Lipid Systems. Marcel Dekker.

REFERENCE BOOKS:

1. Gunstone F. 2006.Modifying Lipids for Use in Food.Woodhead.
2. O'Brien RD.1998. Fats and Oils - Formualting and Processing for Applications. Woodhead.
3. Sikorski ZE & Kolakowska A. 2002. Chemical and Functional Properties of Food Lipids. CRC.

ACTIVITY:

- To carry out an experiment on deep fat frying of vegetables and to study degradation products from oil