Placed at the meeting of
Academic Council
held on 26.03.2018

APPENDIX - CF

MADURAI KAMARAJ UNIVERSITY

(University with Potential for Excellence)

B.Sc. Ancillary Chemistry (Semester)

ALLIED - OILS AND FATS
Revised Syllabus for
(Effective from the academic year 2018-19 onwards)

Semester	Name of the Paper	Hrs/week	Hrs/Semester	Internal	External	credits
III	Oils and Fats -I	4	60	25	75	4
IV	Oils and Fats - II	4	60	25	75	4
V	Oils and Fats - III	4	60	25	75	4
VI	Oils and Fats - IV	4	60	25	75	4
IV	Organic qualitative analysis and milk analysis	2	30	40	60	1
VI	Qualitative and quantitative adultration tests	2	30	40	60	1

Section	Question type	Number of questions to be answered	Marks for each question	Total Marks
A Q. No. 1 - 10	10 Objective questions(Two from each unit) Choose the correct answer from given choices a, b, c and d	10	1	10
B Q. No. 11 - 15	5 Either or type questions (One from each unit with internal choice)	5	7	35
C Q No.16 - 20	Descriptive (One from each unit)	3	10	30

A candidate has to secure a minimum of 40 marks out of 100 marks for passing a paper. (External: Minimum 27 out of 75 marks for theory papers; Minimum of 21 out of 60 marks in the practical papers)

Note: There is no passing minimum for internal assessment marks.

Scheme for Internal Assessment:

Test	10 Marks (average of the best two tests)
Assignment	5 Marks
Seminar/ Group discussion	5 Marks
Peer-Team –Teaching*	5 Marks
Total	25 Marks

SEMESTER - III

UNIT - I

History – common fatty acids present in oils and fats – classification of oils and fats – Omega fatty acids, Trans fats – role of oils and fats in plants, animals and human beings.

UNIT- II

Physical properties of oils and fats – oiliness and viscosity – surface tension – density – refractive index - specific heat and heat of fusion – smoke fire and flash point – solubility and miscibility – determination of refractive index, specific gravity, and viscosity – Engler's apparatus.

UNIT- III

Structure and composition of oils and fats –triglyceride composition of natural fat – hydrolysis – saponification – rancidity and its types – hydrogenation – halogenations – chemical oxidation – epoxidation and polymerization.

UNIT- IV

Synthesis and metabolism in plants and animals – fat metabolism – biosynthesis of fats – ketosis – Kerb's cycle – carbohydrate metabolism- glycolysis

UNIT- V

Enzymes – classification – co-enzyme - chemistry of butter – classification – composition – manufacture and churning.

REFERENCE BOOKS

1. Standard Methods for the Analysis of Oils, Fats and Derivatives 1St Supplement to the 7 th Revised and Enlarged Edition Prepared for publication by A. Dieffenbacher ,W.D. Pocklington
2. A. Bahl and B.S. Bahl, Advanced Organic Chemistry, 1st Multicolour Edition, S. Chand &Company, New Delhi, 2010
3. K.S. Tewari, N.K. Vishnoi and S.N. Mehrotra, A Textbook of Organic Chemistry, 2nd Edition, Vikas Publishing House (Pvt.) Ltd., New Delhi, 2004.

TEXT BOOKS

1. Industrial chemistry, B. K. Sharma
2. The chemistry of oils and fats, Frank D Gunstone, Blackwell Publishers,2004
3. Bailey's Industrial oil and fat products, Vol.2, Daniel Swern, Wiley Interscience Publications

SEMESTER - IV

UNIT - I

Oil seed crops – groundnut, sesame, coconut, castor, cotton seed, mustard, sunflower, linseed, soya bean – black cumin seed – botanical description and their health benefits and drawbacks

UNIT- II

Chemical composition of oils extracted from groundnut, sesame, coconut, and castor

UNIT-III

Production of oils from cotton seed, mustard, sunflower, linseed, soya bean and black cumin seed

UNIT- IV

Milk and milk analysis – Milk constituent – Analysis of milk – organoleptic test – estimation of fat by gravimetric method – determination of density and specific gravity of milk using lactometer.

UNIT- V

Determination of moisture content of cheese – determination of pH of milk – ash content in milk – detection of preservatives in milk – analysis of ghee.

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4. Oil seed crops, E. A. Weiss, Longmann Groups Ltd.

SEMESTER - V

UNIT - I

Process of extraction of oils – cleaning- dehulling- heat treatment – rendering – cooking types of rendering - mechanical expression of oils – solvent extraction – various solvents used – Soxhlet extraction

UNIT- II

Refining –effect of refining-types of refining- bleaching - bleaching absorption method – chemical methods of bleaching - deodorization

UNIT-III

Characteristics of soya bean oil –linseed oil- gingili oil – sunflower oil and cotton seed oil

UNIT- IV

Chemistry of byproducts of oil extraction – methods of spoilage - hydrogenation

UNIT- V

Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol).

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3. Bailey's Industrial oil and fat products, Vol.2, Daniel Swern, Wiley Interscience Publications
4. Oil seed crops, E. A. Weiss, Longmann Groups Ltd.

SEMESTER - VI

UNIT - I

Role of MUFA and PUFA in preventing heart diseases -Estimation of I_2 value & RM value Estimation of saponification value and their significance- acetyl value – Polanski value

UNIT- II

Analysis of ice cream – determination of fat content and acidity – analysis of skimmed milk powder – determination of fat content, moisture content

UNIT-III

Solid content determination in fats by NMR- Spectrophotometric determination of the colour – use of GLC

UNIT- IV

Detection of adulteration – uses of oils and fats – Baudonin test foe sesame oil – Halphen and Bechi test for cotton seed oil – ammonium molybdate test for castor oil – Valenta test – Belliar turbidity temperature test – Letting test for soya bean oil

UNIT- V

Mineral oils – origin – composition – refining – gasoline –octane number – flash point – petrochemical industries in India

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