1. **FST 4201 FATS AND OILS TECHNOLOGY**
2. *COURSE INSTRUCTOR*

*Mr. George Ntibarikure (BSc. Food Sc.&Technology, MSc. Chemistry)*

1. *COURSE TYPE*

*Core course for Year IV BSc. Food Science & Technology*

1. *COURSE STRUCTURE*

*Course is 3 credit units (3 CU): 2 lecture hours and 2 practical hours per week for 15 study weeks; [i.e. 30 lecture hours & 30 practical hours equivalent to 45 contact hours].*

1. *COURSE DESCRIPTION*

*Structure of fats and oils. Sources and classification of fats and oils. Chemical and physical characteristics. Use and importance in industry and nutrition. Processing of fats and oils. Pre-extraction operations, extraction/processing, filtering and refining. Hydrogenation in the production of fats and margarine. Quality and nutritive values of processed products. Chemistry of frying and use of antioxidants. Storage properties of fats and oils.*

1. *COURSE OBJECTIVES*

*General objectives*

1. *Impart knowledge on isolation and purification of fats and oils.*
2. *Impart knowledge and skills in fat and oil products development*
3. *Impart skills in quality assurance, assessment and measurement of physical and chemical changes occurring in fat and oil products*

*Specific objectives*

1. *Isolation and purification of lipids from animal sources*
2. *Isolation and purification of lipids from plant sources*
3. *Measurement of acid value, iodine value, and peroxide value as indices of quality of lipid products*
4. *RECOMMENEDED REFERENCES*
5. *Harry Lawson 1994. Food oils and fats: Technology, utilization and nutrition.*
6. *Allen R.R. 1982. Journal of American Oil Chemist Society*
7. *Gunstone F.D & Norris F.A 1983. Lipids in foods; chemistry, biochemistry and technology*
8. *Chan H.W.S 1987. Food science & technology. A series of Monographs. Autoxidation of unsaturated lipids*
9. *Fennema O.R 1985. Food Chemistry*
10. *Meyer L.H 1987. Food Chemistry*
11. *Schultz H.W & Sinnhuber R.O 1962. Symposium on foods; lipids and their oxidation*
12. *Pearson 1991. Composition and analysis of foods*
13. *COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND*

*EQUIPMENT*

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| ***TOPIC*** | ***CONTENT*** | ***METHOD OF INSTRUCTION/ Time allocation******(i.e. contact hours)*** | ***TOOLS/ Equipment needed*** |
| 1. *Introduction*
 | * *Structure of fats and oils*
* *Sources and classification*
* *Chemical and physical properties*
* *Read and make notes on the significance of saturation and unsaturation in the technology of lipids.*
 | *-Interactive lectures* *(2 hr)* *-Take home assignment:*  | *LCD projector/ BB/ White Markers*  |
| 1. *Recovery of fats and oils*
 | * *Methods*
* *Recovery from plant, animal and marine sources*
* *Pre-extraction operations*
* *Read and make notes on mechanical and solvent extraction of lipids*
* *Lab practical: Mechanical extraction of oil from sunflower/peanut*
 | *-Interactive lectures* *(4 hr)* *-Take home assignment:* *- Lab practical(3hr):*  | *LCD projector/ BB/ White Markers/**Reagents and apparatus* |
| 1. *Refining*
 | * *Importance*
* *Methods*
* *Neutralization*
* *Bleaching*
* *Deodorization*
* *Hydrogenation*
* *Measuring refining losses*
* *Visit BIDCO/MUKWANO*
 | *-Interactive lectures* *(12 hr)* *-Practical skills (9 hrs)* | *LCD projector/ BB/ White Markers/**Transport* |
| 1. *Fats and oil products*
 | * *Margarine production and applications*
* *Shortenings production and applications*
* *Solvent extraction of lipids*
 | *- Interactive lecture* *(1 hr)**-2 Lab practical (6 hr):*  | *LCD projector/ BB/ White Markers / Flip charts/**Reagents and apparatus* |
| 1. *Mid semester evaluation*
 |  | *- Mid semester test* *(2 hr)* |  |
| 1. *Chemistry of frying*
 | * *Methods & requirements*
* *Heat transfer mechanisms*
* *Use of antioxidants*
* *Read and make notes on the use and available antioxidants in lipid industry*
 | *-Interactive lectures* *(4 hr)* *-Take home assignment*  | *LCD projector/ BB/ White Markers / Flip charts* |
| 1. *Antioxidants*
 | *Use and application of antioxidants* | *Interactive lectures (2 hr)* | *LCD projector/ BB/ White Markers / Flip charts* |
| 1. *Quality assessment, assurance and measurement*
 | * *Iodine value, Peroxide value, Acid value and saponification value*
 | *- Interactive lectures* *(3 hr)**- 4 Lab practical (12 hr):*  | *LCD projector/ BB/ White Markers/* *Reagents and Apparatus* |

1. *SUMMARY OF T IME NEEDED*
* *Lecture hours 30 hr*
* *Laboratory hours 30 hr*
1. *OVERALL COURSE EVALUATION*
* *Individual & group assignments and tests 20%*
* *Laboratory practical, class attendance and participation 20%*
* *Final exam 60%*