- SEMETSER:- I
- COURSE NO.:- FCN-112
- COURSE TITLE:- FOOD CHEMISTRY - I
- CREDITS:- 3(2+1)

➢ THEORY

NO. OF UNITS	TOPICS	NO. OF LECTURES
1	*Nature Scope and Development of food chemistry, Role of food chemist.*	*2*
2	*Moisture in foods* ▪ *Role and type of water in foods.* ▪ *Functional properties of water, role of water in food spoilage.* ▪ *Water activity and sorption isotherm* ▪ *Molecular mobility and foods stability*	*4*
3	*Dispersed systems of foods* ▪ *Physicochemical aspects of food dispersion system* *a) Sol b) gel c) foam d) emulsions* ▪ *Rheology of diphase systems*	*4*
4	*Carbohydrates* 1. *Functional characteristics of different carbohydrates (sugars- water relationship, sweetness).* 2. *Maillard reaction, Caramelizateion, Methods to control non enzymatic reactions.* 3. *Modification of carbohydrates- unmodified and modified starches, modified celluloses* 4. *Dietary fibres NDF, ADF, cellulose, hemicellulose, pectin and carbohydrates digestibility – sugars and starch and their energy values.* 5. *Functional properties of polysaccharides, natural vegetable gums, carbohydrate composition of various natural foods.*	*5*
5	*Proteins in foods* *Physicochemical properties- ionic properties, protein denaturation, gelation and hydrolysis.* 1. *Protein content and composition in various foods- cereal grains, legumes and oilseed proteins, proteins of meat, milk,egg and fish.* 2. *Functional properties of proteins in foods – water and oil binding, foaming, gelation, emulsification.* 3. *Effects of processing on functional properties of proteins-heat processing, alkali treatments, chilling, freezing, dehydration and radiations.* 4. *Unconventional sources of proteins- SCP, fish protein concentrates, leaf proteins.*	*5*
6	*Lipids in foods* 1. *Role and use of lipids /fat, occurrence, fat group classification,* 2. *Physicochemical aspects of fatty acids in natural foods, hydrolysis,*	*6*

	reversion, polymorphism and its application. *3. Chemical aspects of lipolysis, auto oxidation, antioxidants,* *4. Technology of fat and oil processing* *a) Refining* *b) Hydrogenations* *c) Inter esterification* *d) Safety use of oils and fats in food formulation*	
7	*Enzymes in food industry* *Carbohydrases (amylases, cellulases, pectinases, invertases)* *Proteasase, lipases and oxidases in food processing.*	*4*
	TOTAL	**30**

- PRACTICALS

NO. OF UNITS	TOPICS	NO. OF EXPT.
1	*Determination of moisture content of foods using different methods.*	*2*
2	*Studies on absorption isotherms of different foods.*	*2*
3	*Swelling and solubility characteristics of starches*	*2*
4	*Rheological properties of diphase systems*	*2*
5	*Determination of crude proteins by microkjaldhal method*	*2*
6	*Determination of essential amino acids i.e. Lysine, tryptophan, methionine etc.*	*2*
7	*Isolation of egg and milk protein*	*2*
8	*Preparation of protein isolate and concentrate of plant proteins*	*2*
9	*Determination of acid value, saponification value and iodine number of fat/ oil*	*2*
10	*Assay of amylases, papain and lipases.*	*3*
	TOTAL	**21**

- *Reference Books:*

- Food Chemistry Vol - I Fennama O. R.
- Food Chemistry Mayer L. H.