



GUJARAT TECHNOLOGICAL UNIVERSITY
Master of Science (Integrated-Biotechnology)

Semester: I

Subject Name: Nutrition Biology

Subject Code: 1310404

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	0	4	70	30	0	0	100

Prerequisite:

Students must be aware about the nutrients required for human growth and development. They know about the different kind of essential nutrient like carbohydrate, lipid & proteins.

Rationale:

It is a branch of biology that focuses specifically on the role of nutrition in the human body. Through nutritional biology students would be equipped with the skill of critical and creative thinking with nutrition requirements and its applicability for the human body.

Course Content:

Unit No.	Content	No. of Hours	Weightage (%)
1	Introduction to Nutrition and Energy Metabolism Defining Nutrition, role of nutrients. Unit of energy, Biological oxidation of foodstuff. Measurement of energy content of food, Physiological energy value of foods, SDA. Measurement of energy expenditure. Direct and Indirect Calorimetry, factors affecting thermogenesis, factors affecting energy input - hunger, appetite, energy balance Energy expenditure in man. Estimating energy requirements, Recommended Dietary Allowances for different age groups. Balanced diet	12	20
2	Dietary carbohydrates and health Review functions of carbohydrates. Digestion, absorption, utilization and storage, hormonal regulation of blood glucose. Dietary requirements and source of carbohydrates, Dietary fiber, role of fibre in lipid metabolism, colon function, blood glucose level and GI tract functions.	10	16
3	Dietary lipid and health Review of classification, sources, functions, digestion, absorption, utilization and storage. Essential Fatty Acids; Functions of EFA, RDA, – excess and deficiency of EFA. Lipotropic factors, role of saturated fat, cholesterol, lipoprotein and triglycerides. Importance of the following: a) Omega – fatty acids. Omega 3/ omega 6 ratio b) Phospholipids c) Cholesterol in the body d) Mono, Polyunsaturated and Saturated Fatty Acids. Dietary implications of fats and oils	15	25
4	Dietary Proteins and health Review of functions of proteins in the body, Digestion and absorption. Essential and Non-essential amino acids. Amino Acid Availability Antagonism, Toxicity and Imbalance, Amino acid Supplementation. Effects of deficiency. Food source and Recommended Dietary Allowances for different	8	14



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	age group. Amino acid pool. NPU, Biological Value, Nitrogen balance. PEM and Kwashiorkor.		
5	Food and drug interactions and Nutraceuticals Nutrient interactions affecting ADME of drugs, Alcohol and nutrient deficiency, Anti-depressants, psychoactive drugs and nutrient interactions, Appetite changes with drug intakes and malnutrition. Food as medicine.	15	25
	Total Hours:	60	

Textbook:

1. Srilakshmi B. Dietetics, 7th Multicolour Ed. New Age International (P) Ltd. 2014.
2. Martha H. Stipanuk. Biochemical, Physiological, and Molecular Aspects of Human Nutrition. Hardback ISBN13: 978-1437709599

Reference Books:

1. Guthrie AH. Introductory Nutrition, 6th Revised Ed., McGraw-Hill Inc., US.1986.

Course Outcomes:

No.	Course Outcomes	RBT Level*
1	Gain insight into the mechanistic aspects of nutrition and energy metabolism	UN,AP,RM
2	Absorption, Utilization, Transport, Excretion, Balance, Deficiency, Toxicity, Sources of nutritional diet	UN,RM,AP
3	Students will gain insight into the mechanistic aspects of Assessment of Nutritional status and also Food and drug interactions and Nutraceuticals	UN,RM,AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List:

Not Applicable

List of Laboratory/Learning Resources Required:

1. https://onlinecourses.swayam2.ac.in/cec19_ag02/preview
2. <https://nptel.ac.in/courses/126104004>