GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3171401
Semester – VII
Subject Name: Food Standards and Quality Assurance

Type of Course: **Professional Core Course**
Prerequisite: **Nil**

Rationale: The increasing need for safe, wholesome and nutritious food by consumers has increased the scientific interest in the comprehensive description of food quality and development of standards and laws that will be used to monitor these. The study of the course is therefore required for the Food engineering and technology students to provide them with a robust and practical knowledge of food quality and the control measures for production of high quality and safe foods. The course inspires students to critically evaluate and update the food quality criteria required by modern food consumers and provide a quality assurance framework appropriate for the needs of public sector food sourcing, production, provision and consumption.

Teaching Scheme & Examination Scheme

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ES (E)	PA (M)	ESE (V)	PA(I)	
3	0	2	4	70	30	30	20	150

Course Content

Sr. No.	Content	Total Hrs
1.	**Introduction: Quality Concepts** Quality Control, Quality Assurance, Quality Policy, Quality Analysis	04
2.	**Statutory & Voluntary Food Standards** AGMARK, BIS, Introduction to FSS Act of India 2006.	05
3.	**Total Quality Management (TQM):** Principles of TQM, TQM Transition Model, Integrated TQM Model, Customer Satisfaction, Six Sigma Technique, Kaizen, 5's Concept, Customer Window.	07
4.	**Quality Management Systems and Auditing:** ISO 9000, 22000, 14000, HACCP, SQF.	05
5.	**Sampling and Estimation for Quality Evaluation:** Sensory evaluation and its need. Criteria for selection of taste panel members, Determination of threshold level. Outline of taste panel methods: Difference tests and Rating tests. Unbiasedness, Consistency, Efficiency, Sufficiency and Completeness of a Statistic. UMVUE, Interval estimation procedure.	10
6.	**Statistical Quality Control:** Probability Theory, Conditional probability and independence, Frequency distribution, Measures of dispersion, Standard Deviation, Normal, Binomial, Poisson & X^2-Distributions, Testing of Hypothesis, Degrees of freedom, Null Hypothesis, t-test, Chi-Square test, Concept of Analysis of Variance (ANOVA), Simple Regression, Correlation coefficients.	11

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	**20**	**18**	**20**	**22**	

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Recommended Reference Books

1. Quality Control for Food Industry. Vol I and II by A. Krammer. AVI Publications.
2. Food Quality Assurance by W.A. Gould. AVI Publications.
3. Handbook of Analysis and Quality Control of fruits & Vegetables Products by Dr. S. Ramgama. Tata Mc Grow Hill Publications.
4. Fundamentals of Statistics by S.C. Gupta. Himalaya Publishing House.
5. Probability and Statistics for Engineers. Miller and Freund's. Prentice Hall of India.
6. Guidelines for sensory analysis in food product development and quality control (2nd ed.). Carpenter, R. P., Lyon, D. H., & Hasdell, T. A. (2000). NY: Springer Publishers.
7. Statistical quality control for the food industry. Hubbard, M. R. (1996). NY: Chapman and Hall

Course Outcomes
At the end of the course, the student should be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Define and differentiate between quality assurance and quality control of foods.	10
CO-2	Explain the importance of food quality control systems in satisfying the requirements of both the consumer and legislation.	25
CO-3	Describe and detect food adulteration, detection and prevention.	25
CO-4	Apply a particular sensory test at advanced level for evaluation of quality of food.	20
CO-5	Recall appropriate food standards code as applicable to a particular food group at the national and International level.	20

List of Practical

1. Tests for wheat flour to detect chalk powder or $NaHCO_3$, lime powder ($CaCO_3$), sand, grits and mineral additions (bicarbonates, phosphates, tartarates and calcium etc.
2. Test for sterilized milk.
3. Determination of peroxide value of given samples of oils/fats.
4. Sensory Evaluation of 04-samples of food products using Ranking Analysis Method & 09- Point Hedonic Scale Score Analysis.
5. Determination of total residual chlorine in water sample.
6. Evaluation of Butter for AGMARK standards through chemical analysis.
7. To establish difference between two different samples using a Triangle Test of Sensory Evolution.
8. Sensory Evaluation of Food samples by different techniques.
9. To perform test to establish adulteration in Ghee.
10. Tests for common adulterants in food products.
11. To evaluate food labels of market samples as per PFA / FSSAI standards.
12. To determine BAR (Brix acid ratio) in a given beverage sample.
13. To detect presence of sodium benzoate in processed foods.

Major Equipment

1. Titration assembly and glassware.
2. Sensory evaluation chambers.
3. Food Quality analysis lab
4. Microbiological testing lab.
5. Texture analyzer
6. Compression testing machine
7. Instruments such as Spectrophotometers, Colorimeters, Chromatography kit, Densimetry instrument Refractometer, Polarimeter.
8. Automatic titrate assembly.
9. Moisture meters.

List of Open Source Software/learning websites

a. www.fao.org/activitieshttp://www.foodscience.org/publications.
b. www.**fssai**.gov.in/
c. www.**foodquality**news.com/
d. **foodquality**.wfp.org/
e. www.**foodquality**.com/
f. http://foodqualityandsafety.wfp.org/
g. foodsafetynews.com