

# ALAGAPPA UNIVERSITY

[A State University Accredited with Accredited with 'A+' Grade by NAAC]  
Karaikudi – 630 003, Tamil Nadu

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## FOOD SENSORS

(Value added course)

Offered by

Department of Bioelectronics and Biosensors

Feeding the world's growing population requires great quantities of food and accurately measuring the quality of that food is vital to sustained personal and economic health. Food quality testing is necessary to monitor and control quality parameters throughout the fresh produce supply chain to meet consumer demands and extend shelf life. Sensors can be used as analytical tools in some food industries, especially applied to the determination of the composition, degree of contamination of raw materials and processed foods, and for the on-line control of the fermentation process.



### Course Benefits

- ❖ Understanding the food safety and measures
- ❖ Understanding the basic of biosensors.
- ❖ Learning the application of sensors in food sectors.

Offered during  
Holidays/Weekends

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<b>Course</b>	<b>FOOD SENSORS</b>
<b>Objectives</b>	The main objective of the course is to provide the attendants theoretical and practical fundamentals of the operation principles of sensor systems. Particular emphasis will be devoted to chemical, and biosensors used in food technology.
<b>Outcomes</b>	At the end of each unit the student will be able to <ul style="list-style-type: none"> <li>❖ understand the food safety and measures describe the role of nanotechnology in food.</li> <li>❖ understand the basic of biosensors.</li> <li>❖ learn the application of sensors in food sectors.</li> </ul>
<b>Schedule</b>	Teaching: 6 hours per week
<b>Prerequisite</b>	Basic knowledge on food safety, importance of food quality, applications of nanotechnology in food industry and biosensors are prerequisite.
<b>Unit I</b>	<b>FOOD SAFETY</b>
	The importance of food safety, how food borne illness affects consumers and retailers, how poor safety practices affect food products, Food hazards, Basic rules regarding personal hygiene, good manufacturing and hygiene practices at various sectors of food processing.
<b>Unit II</b>	<b>FOOD QUALITY</b>
	Basic concepts. Nutritional and sensory attributes and their assessments, causes of undesirable changes leading to quality deterioration in foods and their implications. Determination of probable cause(s) of observed quality change in foods.
<b>Unit III</b>	<b>BASICS OF NANOTECHNOLOGY AND NANOSTRUCTURES IN FOOD</b>
	Evolution of new technologies in the food sector, public perception of nanotechnology food products, Nanomaterials for food applications-Nano-sized food ingredients and additives, naturally occurring food nano substances and nanostructure.
<b>Unit IV</b>	<b>INTRODUCTION TO BIOSENSORS</b>
	Biosensor Design and Fabrication- fundamentals, Biosensor components (electrical, optical based), transducers basic principles, sensors characteristics, analytical evaluation of sensor measurements, accuracy, linearity, detection limit, selectivity and specificity. Scope of biosensors and its limitations.
<b>Unit V</b>	<b>ADVANCED SENSOR APPLICATIONS FOR FOOD PROCESSING</b>
	Gas sensors – Electronic noses, tongues and testers – Chemosensors, biosensors, immunosensors and DNA probes – Sensors for food flavour and freshness; Biosensors for process monitoring and quality assurance – Commercial devices based on biosensors.
<b>References and text books</b>	
<ol style="list-style-type: none"> <li>1. Jennifer K and Peter V. 2006. Nanotechnology in agriculture and food production, Woodrow Wilson International Center.</li> <li>2. D Patranabis “Sensors and Transducers” PHI 2<sup>nd</sup> Edition 2013.</li> <li>3. KouroshKalantar-Zadeh, Benjamin Fry, 2008, Nanotechnology- Enabled Sensors, Springer.</li> <li>4. Erika Kress-Rogers and Christopher, J.B. 2001. Instrumentation and Sensors for Food Industry, Brimelow, CRC Publications.</li> </ol>	
<b>Mode of Evaluation</b>	Assignment/Seminar/Written Examination