

<b>Course No :</b>	<b>PFE 366</b>	<b>Course Title :</b>	<b>Post Harvest Engineering of Horticultural Crops</b>
<b>Semester:</b>	<b>VI</b>	<b>Credits:</b>	<b>: 2 (1+1)</b>

## Syllabus

### Theory

Importance of processing of fruits and vegetables, spices, condiments and flowers. Composition and nutritional value of horticultural crops. Maturation standards and indices, preparation of fruits and vegetables for fresh market. Post harvest handling operations. Cooling of horticultural produce, need changes, methods. Low temperatures and physiological disorders. Quality-components, factors influencing quality. Quality standards for fresh fruits and vegetables. Storage atmosphere-CO<sub>2</sub>, ethylene, micro-biological growth. Modified atmosphere during transport and storage. Cold Storages and control atmosphere storages. Storage deterioration - biological and environmental factors. Codex standards and ISO.

### Practical

Study of maturity of selected fruits, study of physiological maturity of given fruits, study of wax coating, study of a ripening chambers, study of use of chemicals for ripening and enhancing shelf life of fruits and vegetables, study of respiration quotient, study of pre-cooling methods, study of commercial cold storage units, study of chilling injury of selected fruits, study of physiological disorders in fruits and vegetables, study of blanching of vegetables, visit to commercial fruits and vegetable processing plant and pack house.

**Course No :** PFE 367      **Course Title:** : Refrigeration and Air conditioning  
**Semester:** VI            **Credits :** : 2 (1+1)

## Syllabus

### Theory

Terminology & laws of thermodynamics applied to refrigeration, Principles of refrigeration, Units of refrigeration, Types of refrigeration systems. Mechanical vapour compression, Components of mechanical refrigeration system, Reverse Carnot cycle and Bell Coleman cycle. P-V, P-S, P-H diagrams, Vapor compression cycles- dry and wet compression, superheating and sub cooling. Vapour absorption refrigeration system. Common refrigerants and their properties. Cold storage plants.

Thermodynamic properties of moist air, perfect gas relationship for approximate calculation, adiabatic saturation process, wet bulb temperature and its measurement, psychometric chart and its use, elementary psychometric process.

Air conditioning, principles, type and functions of air conditioning, physiological principles in air conditioning. Humidifiers and dehumidifiers, cooling load and calculations, types of air conditioners, applications.

### Practical

Study of vapour compression systems; Study of domestic household refrigerator, Study of domestic water cooler, Study of absorption type refrigeration system, Study of window air conditioner, Tutorials on thermodynamic air cycles, Solving problems of refrigeration on vapour compression and absorption system; Numerical on vapour compression cycle refrigeration system, Study cold storage for fruit and vegetables, Freezing load and time calculations for food materials, Determination of refrigeration parameters (COP) using refrigeration tutor, Determination of refrigeration parameters (COP) using Air conditioning tutor, Numerical on design of air conditioning systems, Estimation of refrigeration requirements in dairy & food plant; Visit to chilling or ice making and cold storage plants.

