Food 4260  Water Management in Food Processing              June 2014

Credits:        (3-L: 0-0)3

Description:   The course is devoted to the management of water and wastewater in the food process industry. The roles of water in food processing, recycle and reuse opportunities, treatment options for water and wastewater are presented. The course also discusses water stewardship in relation to food processing, water and wastewater regulations and implication for HACCP and ISO. Laboratory sessions are designed for the student to become familiar with Standard Methods for the Examination of Water and Wastewater

Prerequisite:  No prerequisite

Instructor:  A.W. Hydamaka  
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Texts/References:      
Required : None


References : Ensuring Water Quality  Food Technology  Jan. 2008

Just Add Water: Regulating and protecting the most common ingredient

Scientific Status Summary,  Journal of Food Science, Vol. 73, Nr. 1  2008

Objectives:  At the end of the course, students should:

1.  Learn proper water and wastewater management in food processing

2.  Be aware of water laws and regulations that govern the food industry.

3.  Become familiar with the term water stewardship.

4.  Understand the roles of water in food process applications

5.  Become aware of opportunities to conserve, recycle, reuse water.
6. Learn treatment options for water and wastewater.

7. Be aware of water and wastewater implications for HACCP and ISO

8. Be familiar with analytical test procedures for the analyses of water and wastewater.

9. Understand the principles behind analytical techniques for water and wastewater.

10. Demonstrate practical proficiency and teamwork in the laboratory

11. Be able to interpret and report results in a scientific report.

**Subject Outline**

Introduction

1. Laws and regulations
   - drinking water standards
   - wastewater standards

2. Roles of water in food process applications

3. Water Stewardship, HACCP, ISO

4. Analytical parameters for potable water

5. Wastewater parameters important in surcharge - COD, BOD, TOC, SS

6. Calculations in volumetric analysis
   - molarity
   - normality

7. Determination of physical and chemical properties of water and wastewater
   - turbidity, alkalinity, acidity, hardness

8. Water disinfection

9. Microbiology of Drinking Water

10. Methods of wastewater treatment
    - primary treatment
      - screening
      - filtration
    - secondary treatment
      - biological
    - tertiary or advanced treatment
      - nitrogen, phosphorus removal
      - water disinfection
      - coagulation
      - softening
      - activated carbon
Laboratory Information:

Analyses of water and food industry wastewater samples covering areas in the subject outline.

Topics

- gravimetric analysis
- volumetric analysis
- instrumental analysis
  - pH meter, spectrometer, D.O. meter, TOC analyzer, CO2D analyzer,
- Test kits
- Tour City of Winnipeg North End Treatment Plant - optional

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"To plagiarize is to take ideas or words of another person and pass them off as one's own. Obviously, it is not necessary to state the source of well known or easily verifiable facts, but students are expected to acknowledge the sources of ideas and expressions they use in their written work, whether quoted directly or paraphrased. This applies to diagrams, statistical tables and the like, as well as written material.

It will also be considered plagiarism and/or cheating if a student submits a term paper written in whole or in part by someone other than himself or herself, of copies the answer or answers of a fellow student in any test, examination, or take-home assignment. Plagiarism or any other form of cheating in examinations or term tests is subject to serious academic penalty."

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