

North Central Michigan College

NCMC MASTER COURSE SYLLABUS

Last Date Revised ____9/24/08____

DIVISION/AREA: Liberal Arts

DEPARTMENT: Chemistry

ASSOCIATE DEAN: Samantha McLin

ORIGINATOR: Ralph Christensen

DEAN OF INSTRUCTION: Tim Dykstra

HOURS OF INSTRUCTION:

Credit hours: 3
Lecture: 3
Lab:
Contact hours: 52.8

COURSE TITLE: Chemistry of Chocolate

COURSE ALPHA: CEM

COURSE NUMBER: 110

CATALOG DESCRIPTION: An examination of the principles of cacao bean harvesting and chocolate processing. It will then look at the chemistry and health issues of cocoa butter and the constituent fatty acids. The presence of antioxidants in chocolate will then be discussed. The next topic will be the chemistry and physiological effect of caffeine and related compounds in chocolate. Finally the class will examine the relationships if any between chocolate and obesity, dental health, headaches, exercise performance, and acne. There is no chemistry prerequisite. The underlying chemistry will be taught as it is needed. This course does not satisfy General Education Requirements.

PREREQUISITE(S): none

COREQUISITE(S): none

GENERAL EDUCATION DISTRIBUTION AREA: None
(example: Social Science Group B)

GENERAL EDUCATION/PROGRAM OUTCOMES:

Think critically and analytically

COURSE OBJECTIVES AND OUTCOMES:

The student will be able to:
Summarize the history of chocolate use
Know critical terms related to chocolate chemistry
Describe the main chemicals found in chocolate
Explain the differences in different types of chocolate
Describe how the cocoa bean is processed.

- Explain the different steps in the processing of chocolate.
- Demonstrate how to temper chocolate
- Describe the chemical composition of cocoa butter
- Separate cocoa butter from chocolate
- Discuss the health effects of stearic acid; in particular its risk factors for cardiovascular disease
- Give the chemical description of phytochemicals and phenolics and the chemical structure of methylxanthines.
- Discuss the possible health benefits of these chemicals found in chocolate.
- Explain the sensory and taste preferences in chocolate
- Explore the relationships, if any, between chocolate consumption and dental health, headaches, obesity, or acne.
- Discuss cultural and psychological approaches to the consumption of chocolate.
- Describe the possible reasons why some people crave chocolate.

METHODS OF INSTRUCTION:

Lecture, group discussion, tasting, laboratory activity

METHODS OF EVALUATION:

Reports on activities. Weekly assignments. Article files collected from scientific and popular magazines.

REQUIRED TEXT AT TIME OF COURSE ADOPTION/REVISION:

TEXTS: none

OPTIONAL SUPPLEMENTARY MATERIALS:

Chocolate & Cocoa, I Knight, Ed., Blackwell Science, 1999

The Science of Chocolate, S.T. Beckett, Royal Society of Chemistry, 2000

Lessons in Chocolate, G. Tannenbaum, Flinn Scientific, 1993

Industrial Chocolate Manufacture and Use, S.T. Beckett, Ed., Blackwell, 1999.

Reasonable accommodations can be provided to students with documented disabilities. Please contact Learning Support Services at 348-6817 to arrange these.

SUGGESTED TIME ALLOWANCE AND SEQUENCE OF INSTRUCTION:

(List general content description of what is being covered each week)

WEEK 1	History of Chocolate and Chocolate Vocabulary
WEEK 2	Chocolate Ingredients
WEEK 3	Cocoa Bean and Chocolate Processing

WEEK 4	Liquid Chocolate Making
WEEK 5	Controlling the Flow Properties of Liquid Chocolate
WEEK 6	Cocoa Butter, Constituent Fatty Acids, and Crystallizing the Fat in Chocolate
WEEK 7	Cardiovascular Health: Role of Stearic Acid on Atherogenic and Thrombogenic Factors
WEEK 8	Phytochemicals and Phenolics – same health effect as a glass of wine?
WEEK 9	Methylxanthines or in otherwords caffeine
WEEK 10	Manufacturing Chocolate Products: Sensory and Taste Preferences
WEEK 11	Obesity and Chocolate Consumption
WEEK 12	Chocolate and Headaches: Is There a Relationship
WEEK 13	Cocoa, Chocolate, Acne, and Dental Health
WEEK 14	Cultural and Psychological Approaches to the Consumption of Chocolate
WEEK 15	Chocolate Cravings and Food Allergies
WEEK 16	Wrap up

APPROVED FOR ADOPTION/REVISION BY THE CRD/AP COMMITTEE ON __10/1/08_____