

THE UNIVERSITY OF WESTERN ONTARIO
BRESCIA UNIVERSITY COLLEGE
DIVISION OF FOOD AND NUTRITIONAL SCIENCES

Foods & Nutrition 2232
Principles of Food Science

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LEARNING

OBJECTIVES: On successful completion of this course students will

- 1) acquire information on the fundamental nature of the ingredients used in food preparation and the basic scientific principles underlying their behaviour through weekly lectures and laboratories
- 2) apply this information to food preparation in the lab
- 3) demonstrate their knowledge of these scientific food principles through tests and exams
- 4) recognize high quality foods and how to use them in daily food choices, food preparation and menu planning
- 5) integrate their nutritional knowledge and gained practical food preparation experience to complete a personal menu planning assignment
- 6) research and explain an assigned food science topic through a written summary document and an oral class presentation

STRESS:

This course is a study of the physical structure, chemical composition and nutritive value of foods with emphasis on the effect of the physical and chemical environment on a finished product. An experimental approach will demonstrate the principles and method of food preparation.

The topics for discussion include carbohydrate foods (fruits, vegetables, cereals, starch, sugar), protein foods (milk, cheese, eggs, meat, fish, poultry), beverages (coffee, tea), flour mixtures (flour, leavening agents, quick breads, bread, cakes, pastry) and menu planning.

APPROACH: Lectures, videos, readings and discussions will be integrated with experiments done in the food laboratory.

TEXT: Bennion, Marion. Introductory Foods, 13th ed.
New Jersey: Prentice-Hall, Inc.

Hekmat, S. 2014. Principles of Food Science Laboratory Manual and Recipe book.

MARKING:	Tests (2 midterms)	25%
	Lab Tests, Menu Planning & Performance	30%
	Project & Presentation	10%
	Final Exam	35%
	Total	100%

GENERAL ADVICE: The following apparel is required for the Food Lab:

white uniform or lab coat
white shoes, hair net

Lab Fees: \$80.00 per student
(A receipt for payment of laboratory fees must be submitted to the instructor by the end of the third week of classes in order to continue in the course.)

Specific Course Policies: For mark components of 10% or higher, any student who misses these requirements can request for accommodation from the academic counsellors on medical or non-medical grounds with proper documentation submitted. The academic counsellors will then make the request for accommodation to the faculty as necessary.

**Divisional
Policies:**

The policy of the Division of Food and Nutritional Sciences is as follows:

- 1) Failure to attend at least 75% of laboratories or studios will result in failure in the laboratory or studio and an "incomplete" in the course. Successful completion of the laboratory/studio will be necessary in order to receive credit in the course.
- 2) Assignments are due at time and date noted. **The mark will be reduced by 20%** on assignments submitted late. Assignments submitted after seven days will **not** be accepted for marking, except with documentation to show a confirmed personal illness or a death in her/his immediate family.
- 3) There will be no make-up mid-term test for a student who has missed a test, except with documentation to show a confirmed personal illness or a death in her/his immediate family.

TOPICS TO BE COVERED

- **FACTORS IMPORTANT IN FOOD PREPARATION:**
Food composition, simple and complex carbohydrates, heat, measurement.
- **FRUITS:**
Classification, structure of plant cell, composition and nutritive value, plant pigments, enzymatic browning, maillard browning, flavour constituents, and selection of fruits.
- **VEGETABLES:**
Classification, composition and nutritive value, flavour of vegetable, storage of vegetables, texture of vegetables and effects of cooking, and potatoes.
- **MILK AND CHEESE:**
Milk - Composition and nutritive value, production of milk for market, constituents of milk, physical properties of milk, coagulation of milk, types and uses of milk.
Cheese - Brief history, classification, manufacturing, ripening of cheese, processed cheese, composition and nutritive value, and cheese cookery.
- **EGGS:**
Structure, composition and nutritive value, egg quality, coagulation, egg white foam, and egg cookery.
- **SUGAR AND SUGAR COOKERY:**
Chemical structure of sugars, market forms, syrups, relative sweetness of sugars, solubility of sugar, and crystallization of sugar.
Candies - Classification and principles for candy making.
- **STARCH:**
Sources, composition and molecular structure, gelatinization, hot paste, gel structure and problems in starch cookery.
- **CEREALS:**
Structure of cereal kernel, enriched cereals, different types of cereals, alimentary pastes, and cereal cookery.
- **GELATIN:**
Market forms, nutritive value, and gel formation.
- **FAT:**
Characteristic and composition of food fats, rancidity of fat, and uses and care of frying fat.
- **MEAT:**
Structure of meat cut, composition and nutritive value of meat, post-mortem changes and aging, inspection and grading, meat cuts and identification, tenderness of meat, care of meat at home, and meat cookery.
- **POULTRY:**
Classification, processing, composition, and cooking poultry.
- **FISH:**
Classification, composition and nutritive value, market forms, shellfish, and fish cookery.
- **FLOUR:**
Milling process, types of flour, constituents of flour and gluten development.
- **LEAVENING AGENTS:**
Types, individual leavening agents and their characteristics.
- **FLOUR MIXTURES:**
Classification and factors affecting texture of baked products.
Quick Breads - Popovers, griddle cakes, waffles, muffins, and biscuits.
Cakes - Classification, ingredients and mixing method for different types cake and cake mixes.
Bread - Types of bread, ingredients and proportions, methods of mixing, and staling of bread.
Pastry - Shortening power of fat and oil in pastry, tenderness and flakiness of plain pastry and puff pastry.

- **TEA AND COFFEE:**
History and popularity, processing, composition, and factors affecting quality.
- **MENU PLANNING:**
Meal patterns, writing of menus, purpose of menu planning, consideration for planning menus, and menu evaluation.

SUGGESTED BOOKS & JOURNALS

The following books and journals may be useful in your study and your oral report.

Books

1. Sikorski, Z. E. Chemical and Functional Properties of Food Components.
2. Jowitt, R. A Classification of Foods and Physical Properties.
3. Cassens, R. G. Nitrite Cured Meat.
4. O'Brien, R. D. Fats and Oils: Formulating and Processing for Applications.
5. McWilliams, M. Food Fundamentals. California: Plycon Press.
6. Charley, H. Food Science. New York: The Ronald Press Co.
7. Freeland-Groves, J.H. and G.C. Peckham. Foundations of Food Preparation. 6th ed. New Jersey: Prentice Hall.
8. Gates, J.D. Basic Foods.
Chicago: Holt Rinehart and Winston Inc.
9. Kinder, F. and Green, N.R. Meal Management.
New York: Macmillan Publishing Co.
10. Vail, G.E., Phillips, J.A., Rust, L.O., Griswold, K.M., and Justin, M.M.
Foods. Boston: Houghton Mifflin Co.
11. Charley, H. Foods: A Scientific Approach. 3rd ed. New Jersey: Prentice Hall.

Journals

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| 1. Journal of Food Science | 8. Journal of Food Composition & Analysis |
| 2. Food Technology | 9. Journal of the American Oil Chemists' Society |
| 3. Food in Canada | 10. Journal of the American Dietetic Association |
| 4. Cereal Foods World | 11. Canadian Journal of Dietetic Practice and Research |
| 5. Cereal Chemistry Association | 12. Journal of Family & Consumer Sciences |
| 6. Prepared Foods | 13. Family and Consumer Sciences Research Journal |
| 7. Consumer Reports | 14. Journal of Dairy Science |

BRESCIA UNIVERSITY COLLEGE ACADEMIC POLICIES AND REGULATIONS

1. POLICY REGARDING MAKEUP EXAMS AND EXTENSIONS OF DEADLINES

When a student requests academic accommodation (e.g., extension of a deadline, a makeup exam) for work representing 10% or more of the student's overall grade in the course, it is the responsibility of the student to provide acceptable documentation to support a medical or compassionate claim. All such requests for academic accommodation **must** be made through an Academic Advisor and include supporting documentation. Academic accommodation on medical grounds will be granted only if the documentation indicates that the onset, duration and severity of the illness are such that the student could not reasonably be expected to complete her academic responsibilities. Appropriate academic accommodation will be determined by the Dean's Office in consultation with the student's instructor(s). Please note that personal commitments (e.g., vacation flight bookings, work schedule) which conflict with a scheduled test, exam or course requirement are not grounds for academic accommodation.

A UWO Student Medical Certificate (SMC) is **required** if a student is seeking academic accommodation on medical grounds. This documentation should be obtained at the time of the initial consultation with the physician/nurse practitioner or walk-in clinic. A SMC can be downloaded under the Medical Documentation heading of the following website: <https://studentservices.uwo.ca/secure/index.cfm> . If it is not possible to have an SMC completed by the attending physician/nurse practitioner, the student must request documentation sufficient to demonstrate that her ability to meet academic responsibilities was seriously affected. Please note that under University Senate regulations documentation stating simply that the student "was seen for a medical reason" or "was ill" is **not** adequate to support a request for academic accommodation. All documentation is to be submitted to an Academic Advisor.

Whenever possible, requests for academic accommodation should be initiated in advance of due dates, examination dates, etc. Students must follow up with their professors and Academic Advisor in a timely manner.

The full statement of University policy regarding extensions of deadlines or makeup exams can be found at <http://www.westerncalendar.uwo.ca/2013/pg117.html>

2. ACADEMIC CONCERNS

If you feel that you have a medical or personal problem that is interfering with your work, contact your instructor and Academic Advisor as soon as possible. Problems may then be documented and possible arrangements to assist you can be discussed at the time of occurrence rather than on a retroactive basis. Retroactive requests for academic accommodation on medical or compassionate grounds may not be considered.

If you think that you are too far behind to catch up or that your work load is not manageable, you should consult an Academic Advisor. If you consider reducing your workload by dropping one or more courses, this must be done by the appropriate deadlines (refer to the Registrar's website, www.registrar.uwo.ca, for official dates). You should consult with the course instructor and the Academic Advisor who can help you consider alternatives to dropping one or more courses. *Note that dropping a course may affect OSAP eligibility and/or Entrance Scholarship eligibility.*

The Dean may refuse permission to write the final examination in a course if the student has failed to maintain satisfactory academic standing throughout the year or for too frequent absence from the class or laboratory.

3. ABSENCES

Short Absences: If you miss a class due to a minor illness or other problems, check your course outline for information regarding attendance requirements and make sure you are not missing a test

or assignment. Cover any readings and arrange to borrow notes from a classmate. Contact the course instructor if you have any questions.

Extended Absences: If you have an extended absence, you should contact the course instructor and an Academic Advisor. Your course instructor and Academic Advisor can discuss ways for you to catch up on missed work and arrange academic accommodations, if appropriate.

4. POLICY ON CHEATING & ACADEMIC MISCONDUCT

Students are responsible for understanding the nature of and avoiding the occurrence of plagiarism and other academic offences. Students are urged to read the section on Scholastic Offences in the Academic Calendar. Note that such offences include plagiarism, cheating on an examination, submitting false or fraudulent assignments or credentials, impersonating a candidate, or submitting for credit in any course without the knowledge and approval of the instructor to whom it is submitted, any academic work for which credit has previously been obtained or is being sought in another course in the University or elsewhere. Students are advised to consult the section on Academic Misconduct in the Western Academic Calendar.

If you are in doubt about whether what you are doing is inappropriate or not, consult your instructor, the Student Services Centre, or the Registrar. A claim that "you didn't know it was wrong" is not accepted as an excuse.

The penalties for a student guilty of a scholastic offence (including plagiarism) include refusal of a passing grade in the assignment, refusal of a passing grade in the course, suspension from the University, and expulsion from the University.

Plagiarism:

Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com.

Computer-marked Tests/exams:

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating. Software currently in use to score computer-marked multiple-choice tests and exams performs a similarity review as part of standard exam analysis.

5. PROCEDURES FOR APPEALING ACADEMIC EVALUATIONS

All appeals of a grade must be directed first to the course instructor. If the student is not satisfied with the decision of the course instructor, a written appeal signed by the student must be sent to the Department Chair. If the response of the department is considered unsatisfactory to the student, she may then submit a signed, written appeal to the Office of the Dean. Only after receiving a final decision from the Dean may a student appeal to the Senate Review Board Academic. A Guide to Appeals is available from the Ombudsperson's Office, or you can consult an Academic Advisor. Students are advised to consult the section on Academic Rights and Responsibilities in the Western Academic Calendar.

6. PREREQUISITES AND ANTIREQUISITES

Unless you have either the prerequisites for a course or written special permission from your Dean to enroll in it, you will be removed from the course and it will be deleted from your record. This decision may

not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Similarly, you will also be deleted from a class list if you have previously taken an antirequisite course unless this has the approval of the Dean. These decisions may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course because you have taken an antirequisite course.

7. SUPPORT SERVICES

The Brescia University College Registrar's website, with a link to Academic Advisors, is at http://www.brescia.uwo.ca/academics/registrar_services/index.html . The Western Registrar's website is at <http://www.registrar.uwo.ca/index.cfm> . The website for the Student Development Centre at Western is at <http://www.sdc.uwo.ca/> . Students who are in emotional/mental distress should refer to Mental Health @ Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Portions of this document were taken from the Academic Calendar, the Handbook of Academic and Scholarship Policy and the Academic Handbook of Senate Regulations. This document is a summary of relevant regulations and does not supersede the academic policies and regulations of the Senate of the University of Western Ontario.