

THE UNIVERSITY OF WESTERN ONTARIO

BRESCIA UNIVERSITY COLLEGE

DIVISION OF FOOD AND NUTRITIONAL SCIENCES

Foods & Nutrition 3342A
Advanced Food Science

Course Director: Dr. L. Ahmadi
Office MRW 161
Phone Number: 519-432-8353, ext.28068
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Office Hours: Tuesday 1:30-2:30 pm
Or, by appointment

Learning Objectives:

On successful completion of this course students will:

- 1) recognize and appreciate the modern food technology used in food processing and food preservation
- 2) acquire information on food microbiology and food safety
- 3) study the importance of carbohydrate, fat and protein in product formation
- 4) demonstrate their acquired knowledge of food processing, food preservation, food microbiology, food safety and food composition in written midterm and final exams
- 5) research, design and conduct a questionnaire on an assigned food science topic as a group project
- 6) describe and discuss the questionnaire results through a group presentation and written report

STRESS:

Emphasis will be placed on the knowledge of processing methods and their effects on the nutritive values and acceptability of a product, the properties and uses of carbohydrate, fat and protein in food preparation and in the food industry, and the pros and cons of food additives. Food analysis is stressed in the food lab.

APPROACH:

Lectures, visual aids, discussions, assigned readings and lab experience are all methods used to acquire a knowledge and understanding in certain areas of food and food analysis.

- TEXT (Required):**
1. Vieira, E. R. Elementary Food Science, New York: Van Nostrand Reinhold.
 2. Hekmat, S. Advanced Food Science Laboratory Manual.

- TEXTS (Optional in Brescia Library)**
1. Damodaran, S. and Paraf, A. Food Proteins an their applications.
 2. Mazza, G. Functional Foods: Biochemical and Processing Aspects.
 3. Satin, M. Food Irradiation: A Guidebook. 2nd ed.
 4. Barbosa-Canovas, G. V. Food Preservation by Moisture Control.
 5. Akoh, C. C. and Min, D. B. Food Lipids, Chemistry, Nutrition and Biochemistry.
 6. Karmas, E. and Harris, R.S. Nutritional Evaluation of Food Processing. 2nd ed. Westport, Conn. AVI Publishing Co. Inc.
 7. Zapsalis, C. and R. A. Beck. Food chemistry and Nutritional Biochemistry. Frtamingham, Massachusetts. John Wiley & Sons Inc.
 8. Cliver, D.O. Foodborne Disease. San Diego, Calif.
 9. Sim, D. S. , S. Nakai and Guenter, W. Egg Nutrition and Biotechnology.
 10. Whitaker, J. R. Principles of Enzymology for Food Sciences.

SCHEDULE OF TOPICS:	Weeks 1 - 5	Food microbiology and fermentation, food spoilage, food poisoning, canning, freezing.
	Weeks 6 - 10	Dehydration, radiation, carbohydrate chemistry
	Weeks 11 - 13	Protein chemistry, fat chemistry, food additives.

ASSIGNMENTS: Class project and lab reports will be discussed at the beginning of the semester.

MARKING:	Class Test	30%
	Lab Test	15%
	Project & Presentation	20%
	Final Examination	35%
	TOTAL	100%

Lab Fees: \$40.00 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.)

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

- 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 within seven (7) days of the due time. 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.

Specific Course Policies:

For mark components of 10% or higher, any student who misses these requirements can request 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.

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DESCRIPTION

1. **FOOD PROCESSING AND ITS EFFECT ON THE NUTRITIVE VALUE OF FOOD:**

- a) Keeping quality of food, spoilage agents, food and micro-organisms.
- b) Canning - history, acid and low-acid foods, pH-temperature relationship, heat penetration, canning methods, spoilage of canned foods, effects of canning on nutrient retention of canned foods.
- c) Jelly and related products - gel formation, pectin substances, types of pectin, roles of essential ingredients in gel formation, jelly failure and possible causes.
- d) Freezing - effects of freezing on micro-organisms in food, freezing process and methods, pretreatment of food, physical and chemical changes during freezing, storage and thawing, effect of freezing on the nutrient retention in frozen food.
- e) Dehydration - changes in food during drying, selection of drying methods and freeze-dehydration, dehydration of coffee, tea, fruits and fruit juice products, and dry milk products, influence of drying on food acceptability and nutrient retention.
- f) Radiation - discovery, radioactive decay, unit of radiation, ionizing radiation, radiation effect on micro-organisms and nutrients of food, wholesomeness and acceptability of radiation-stabilized food.

2. **FOOD PROTEINS:**

Type, structure and classification of amino acids and protein, chemical and physical properties of protein, determination of protein in food, meat protein, soy protein and microbial protein.

3. **FOOD CARBOHYDRATES:**

Classification, chemistry, structure of cellulose and hemicellulose, crude fibre, browning reaction, sweeteners and sweetness, natural vegetable gums.

4. **FOOD FATS:**

Chemistry, properties, processing of fat, commercial fats and oils, rancidity, antioxidants.

5. **FOOD ENZYMES:**

Distribution of enzymes in food materials, factors affecting enzymatic activity, use of enzymes in food processing, enzymatic browning.

6. **FOOD ADDITIVES:**

Classification, functions, applications, safety for use, health protection and food laws in Canada.

ADVANCED FOOD LAB

LAB

- 1 Introduction
- 2 Group Project
- 3 Freezing Principles
- 4 Canning Principles
- 5 Group Project
- 6 Mono- & Disaccharides / Iodine Test for Starch
- 7 Non-enzymatic Browning
- 8 Isolation of Casein and Isolation of Wheat Gluten
- 9 The Effect of Fat, Sugar, Stabilizer, Milk-Solids-Nonfat on
Manufacture of Yogurt
- 10 Sampling and sample Handling
- 11 Lactic Acid Bacteria in Fermented Dairy Products
- 12 Evaluation of Canned and Frozen Products, Yogurt and Lactic Acid
Bacteria
- 13 Group Project

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.

If supporting documentation is from a family physician, Hospital Urgent Care Centre or Emergency Department, or a walk-in clinic a UWO Student Medical Certificate (SMC) is **required**. To download an SMC go to <https://studentservices.uwo.ca/secure/index.cfm> and follow the link under "Medical Documentation". Documentation should be obtained at the time of the initial visit. If it is not possible to have an SMC completed by the attending physician, 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 document-ation stating simply that the student "was seen for a medical reason" or "was ill" is **not** considered 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/2011/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 University of Western Ontario Registrar's website is at <http://www.registrar.uwo.ca/index.cfm>

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 West