

BRESCIA UNIVERSITY COLLEGE
SCHOOL OF FOOD AND NUTRITIONAL SCIENCES
Foods & Nutrition 3342A (Section 530)
Advanced Food Science

Course Director: Dr. S. Hekmat
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Office Hours: By appointment

Classes: Tuesdays, 8:30-11:30AM in BR-201
Laboratories: Tuesdays, 11:30AM-2:30PM or Wednesday, 8:30-11:30AM or
Thursdays, 11:30AM-2:30PM in UH-MRW-156

Prerequisite (s): Chemistry 2003A/B or 2213A/B and Food and Nutrition 2232
Registration in the BSc Foods and Nutrition programs.

DESCRIPTION: This course examines selected processing methods and their effect on the nutritive value and acceptability of a product; properties and uses of food carbohydrates, fats and enzymes used in food industry. Emphasis will be placed on the knowledge of processing methods and their effects on the nutritive values and acceptability of a product, the chemical properties and uses of carbohydrate, fat and protein in food preparation and in the food industry. Food processing, chemistry and analysis will be stressed in the food lab.

APPROACH: Lectures (in-class and/or on-line), 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.

LEARNING OBJECTIVES:

Upon successful completion of this course, students will be able to demonstrate the Brescia Competencies as follows:

- 1) Recognize and appreciate the modern food technology used in food processing and food preservation (Critical Thinking, Inquiry and Analysis, Level 4)
- 2) Acquire information on food microbiology and safety (Critical Thinking, Inquiry and Analysis, Problem Solving, Level 4)
- 3) Study the importance of carbohydrate, fat and protein in product formation (Critical Thinking, Inquiry and Analysis, Problem Solving, Level 4)
- 4) Demonstrate their acquired knowledge of food processing, food preservation, food microbiology, food safety and food composition in written midterm and final exams (Critical Thinking, Inquiry and Analysis, Problem Solving, Level 4)
- 5) Research, design and conduct a questionnaire on an assigned food science topic as a group project (Critical Thinking, Self-Awareness and Development, Social Awareness and Engagement, Level 4)
- 6) Describe and discuss the questionnaire results through a group presentation and written report (Critical Thinking, Self-Awareness and Development, Social Awareness and Engagement, Level 4)

TEXT (Required): 1. Hekmat, S. 2018. Advanced Food Science Laboratory Manual.

TEXTS (Optional in Brescia Library)

1. Nielsen, S. 2017. Food Analysis. 5th edition.
2. Kodali, D. R. 2014. Trans Fats Replacement Solution.
3. Cruz, R. M. S., Khmelinskii, I., Vierira, M. C. 2014. Methods in Food Analysis.
4. Delgado, A. M., Almeida, M. D. V., and Parisi, S. 2017. Chemistry of the Mediterranean Diet.
5. Hosseinian, F., Oomah, B. D., and Campos-Vega, R. 2017. Dietary Fiber Functionality in Food and Nutraceuticals from Plant to Gut.
6. Preedy, V. R. 2015. Processing and Impact on Active Components.
7. Topp, E. and Howard, M. 2017. The Complete Book of Small-Batch Preserving.
8. Lawrence, M. 2013. Food Fortification.
9. Redman, N. E. and Morrone, M. 2017. Food Safety. 3rd edition.
10. Institute of Medicine, National Research Council of the National

- Academes. 2003. Scientific Criteria to Ensure Safe Food.
11. Sun, D. 2016. Computer Vision Technology for Food Quality.
 12. Pawsey, R. K. 2002. Case Studies in Food Microbiology for Food Safety and Quality.
 13. Damodaran, S. and Paraf, A. 1997. Food Proteins and their Applications.
 14. Mazza, G. 2002. Functional Foods: Biochemical and Processing Aspects.
 15. Satin, M. 2006. Food Irradiation: A Guidebook. 2nd ed.
 16. Barbosa-Canovas, G. V. 1995. Food Preservation by Moisture Control.
 17. Akoh, C. C. and Min, D. B. 2008. Food Lipids, Chemistry, Nutrition and Biochemistry.
 18. Zapsalis, C. and R. A. Beck. 1986. Food chemistry and Nutritional Biochemistry. Framingham, Massachusetts. John Wiley & Sons Inc.
 19. Cliver, D.O. 2002. Foodborne Disease. San Diego, Calif.
 20. Sim, D. S., S. Nakai and Guenter, W. 1999. Egg Nutrition and Biotechnology.
 21. Whitaker, J. R. 1994. Principles of Enzymology for Food Sciences.
 22. Vieira, E. R. 1997. Elementary Food Science, New York: Van Nostrand Reinhold.

TOPICS:

Food Microbiology and Safety: Fermentation, Food Spoilage, Food Poisoning

Food Processing: Canning, Refrigeration, Freezing, Dehydration, Radiation

Food Chemistry: Carbohydrate, Protein, and Fat Chemistry

ASSIGNMENTS:

Class and lab projects will be discussed at the beginning of the semester.

MARKING:

Class Test (Oct. 30, 2018)	25%
Lab Test (Dec. 4, 2018)	15 %
Group Lab Project (Nov. 20-22, 2018)	10 %
Class Project & Presentation	10 %
Final Examination (TBD)	40 %
TOTAL	100%

LAB FEES:

\$45.00 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.)

COURSE SPECIFIC 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.
- 4) 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.

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, pre-treatment 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.

2018-19 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 for illness 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. Minor ailments typically treated by over-the-counter medications will not normally be accommodated.

Students must submit their documentation along with a request for relief specifying the nature of the accommodation being requested no later than two business days after the date specified for resuming responsibilities. In cases where there might be an extended absence or serious issue, students should submit their documentation promptly and consult their Academic Advisor for advice during their recovery period. Whenever possible, students who require academic accommodation should provide notification and documentation in advance of due dates, examinations, etc. Appropriate academic accommodation will be determined by the Dean's Office/Academic Advisor in consultation with the student's instructor(s). Academic accommodation may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, arranging Special Exams or Incompletes, re-weighting course requirements, or granting late withdrawals without academic penalty

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 from: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf . 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.

The full policy on requesting accommodation due to illness can be viewed at:
http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_12

2. ACADEMIC CONCERNS

If you feel that you have a medical or personal challenge 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 are not normally considered.

If you think that you are too far behind to catch up or that your work load is not manageable, you should consult your 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, <http://brescia.uwo.ca/academics/registrar-services/> or the list of official sessional dates in the Academic Calendar, see the Sessional Dates tab at <http://www.westerncalendar.uwo.ca/index.cfm?SelectedCalendar=Live&ArchiveID=>). 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.

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 and warranted.

It is important to note that the Academic 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 (http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#SubHeading_68).

4. SCHOLASTIC OFFENCES

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at: http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_20 .

Students are responsible for understanding the nature of and avoiding the occurrence of plagiarism and other academic offences. 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 Scholastic Discipline for Undergraduate Students in the Academic Calendar.

If you are in doubt about whether what you are doing is inappropriate or not, consult your instructor, the Academic Dean's Office, 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.

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 (<http://www.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 is to be sent to the School Chair. If the response of the Chair is considered unsatisfactory to the student, she may then submit a written appeal to the Office of the Dean. If the student is not satisfied with the decision of the Dean, she may appeal to the Senate Review Board Academic (SRBA), if there are sufficient grounds for the appeal. For information on academic appeals you can consult your Academic Advisor or see the Student Academic Appeals – Undergraduate in the

Academic Calendar

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_14.

Note that final course marks are not official until the Academic Dean has reviewed and signed the final grade report for the course. If course marks deviate from acceptable and appropriate standards, the Academic Dean may require grades to be adjusted to align them with accepted grading practices.

6. PREREQUISITES

Unless you have either the prerequisites for a course or written special permission from the 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 prerequisite(s).

7. SUPPORT

Support Services

The Brescia University College Registrar's website, with a link to Academic Advisors, is at <http://brescia.uwo.ca/academics/registrar-services/> . The website for the Student Development Centre at Western is <http://www.sdc.uwo.ca/> .

Mental Health and Wellness

Students may experience a range of issues that can cause barriers to your learning, such as increased anxiety, feeling overwhelmed, feeling down or lost, difficulty concentrating and/or lack of motivation. Services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about mental health and wellness at Brescia at <http://brescia.uwo.ca/life/mental-health-wellness/>. Students who are in emotional/mental distress should refer to Health and Wellness at Western, http://uwo.ca/health/mental_wellbeing/index.html, for information about how to obtain help for yourself or others.

Sexual Violence

All members of the Brescia University College community have a right to work and study in an environment that is free from any form of sexual violence. Brescia University College recognizes that the prevention of, and response to, Sexual Violence is of particular importance in the university environment. Sexual Violence is strictly prohibited and unacceptable and will not be tolerated. Brescia is committed to preventing Sexual Violence and creating a safe space for anyone in the Brescia community who has experienced Sexual Violence.

If you or someone you know has experienced any form of Sexual Violence, you may access resources at <http://brescia.uwo.ca/life/sexual-violence/>.

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.