

TITLE OF COURSE: FS 583 Advances in Cereal Chemistry and Technology

CREDIT HOURS: 3 HOURS

INSTRUCTOR: Dr. Brennan Smith

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OFFICE: AG SCI 111B (UI)

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OFFICE HOURS: To be determined

COURSE TIME: MWF 8:30–9:20

SKYPE ADDRESS: Brennan.smith364

LOCATION: To be determined

### COURSE DESCRIPTION:

This course provides in-depth information on wheat chemistry and technology as well as chemistry and uses of other cereal grains and legumes. Emphasis will be given to composition and functionality of wheat as related to processing and product quality, along with reviews of recent advances in cereal sciences and technology

**TEXT BOOK:** Recommended: Delcour J, Hosney C. (2010). *Principles of Cereal Science and Technology*. Third Addition. AACC International, Inc. St. Paul, Minnesota.

Note: Some semesters the recommended text book is offered free online by Kellogg's and AACCI. Please check with the instructor and determine if this option is available prior to purchasing a hard copy of the required text.

Handouts, journal articles, and other scientific literature used in this course will be distributed as necessary by the instructor.

### RECOMMENDED PREREQUISITES:

MBios 303, Chem 345, and FS 460 or equivalent

### GRADING:

Quizzes	100 Points
Mid Term Exam	100 Points
Journal Reviews	100 Points
Term Paper/Presentation	100 Points
Attendance/Participation	50 Points
Final Exam	150 Points
<b>Total</b>	<b>600 points</b>

**GRADING:**

<u>Grades:</u>	<u>Total Points</u>	<u>Final Grade</u>	
		WSU	UI
	<b>570 – 600</b>	A	A
	<b>540 – 569</b>	A–	A
	<b>430 – 539</b>	B+	B
	<b>516 – 429</b>	B	B
	<b>480 – 515</b>	B–	B
	<b>456 – 479</b>	C+	C
	<b>438 – 455</b>	C	C
	<b>420 – 437</b>	C–	C
	<b>&lt;420</b>	F	F

**EVALUATION:**

**Exams:** Exams will be in short answer and/or essay format. **Please bring a blue or black pen for all in class exams.** Exams will be given during regularly schedule class times.

**Term Paper:** Terms papers are expected to be ~10 pages in length. Term paper topics will be selected from a provided list of topics. Topics not on list are acceptable only upon instructor approval. Papers are to be submitted as a single double spaced document utilizing 12 pt Times New Roman font, with one inch margins. Specifics on content and formatting will be distributed as another document.

**Journal Article Review:** 5 peer reviewed journal articles will be distributed to students over the course of the semester for review. Journal articles will be summarized and analyzed by students. Analysis will include theme/ purpose, validity of research, validity of methods used, overall content, adequacy of written language, reporting of results, sufficient discussion of results, your overall impressions of the research and publication, and what you learned and/or found interesting.

**Quizzes:** Quizzes can be given without notice on any day of lecture. Advance notice may or may not be given. Quizzes will be worth ~20 points each

**You are expected to attend every class:** Attendance is mandatory! Exceptions will only be given for illnesses and emergencies. Other absences for scholarly activities or career progression may be given. **This will only occur when there is no major conflict with this course, and upon advanced approval by the instructor.**

If ample notice is not given, it is at the discretion of the instructor whether or not to allow for absence without consequence. The ability to take makeup exams, quizzes, and assignments is also at the discretion of the instructor.

**STUDENT LEARNING OUTCOMES (SLOs):** Successful completion of the course should enable the student to:

- A. Identify and describe the chemistry of cereal and legume components and their functionality at a fundamental/molecular level on exams, quizzes, reviews, class discussions, and presentations
- B. Describe how pre-harvest production and environmental factors can affect grain composition on exams, quizzes, reviews, class discussions, and presentations
- C. Outline and discuss various milling processes and how cereal structure and chemistry affect the process on exams, quizzes, reviews, class discussions, and presentations
- D. Describe the various types of cereal processing on exams, quizzes, reviews, class discussions, and presentations
  - a. Identify and describe how the chemistry of each component/step of these processes affects end-use
  - b. Outline and discuss the processes of cereal product production as it relates to health and nutrition in humans
- E. Interpret, summarize, and discuss scientific literature for journal reviews and course discussions using reviews and class discussions
- F.

**Students with Disabilities:**

**WSU students:** Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

**UI students:** Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306 (Phone 885---6307; Email [dss@uidaho.edu](mailto:dss@uidaho.edu); website at [www.uidaho.edu/dss](http://www.uidaho.edu/dss)) in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

**Academic Regulations & Student Affairs Policy Regarding Absences (UI):**

It is the policy of the Office of Student Affairs to assist students during crisis situations where they are unable to notify their instructors prior to a hurried emergency departure. The Office of Student Affairs will send professors an "Emergency Notification" in those instances where the student will be away for more than two days. The Office of Student Affairs will not issue notifications retroactively or for "one-day emergencies."

**Academic Etiquette:** Cell phones are a distraction. Please keep cellular phones silent during class and lab sessions. **Students are also expected to be kind, courteous, and professional towards instructors, teaching assistants, university staff, and other students at all times without exception.**

**WSU Safety Statement:** Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act” protocol for all types of emergencies and the “Run, Hide, Fight” response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI’s Run, Hide, Fight video and visit the WSU safety portal.

**University of Idaho Classroom Learning Civility Clause:** In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center’s confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).

**Academic integrity (WSU)** will be strongly enforced in this course. Each student must turn in original work. No copying will be accepted. Students who violate WSU's Standards of Conduct for Students will receive an F as a final grade in this course, will not have the option to withdraw from the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions:  
<http://conduct.wsu.edu/policies/standards-of-conduct/>

**Plagiarism and Academic Integrity Addendum (UI):**

University of Idaho, Student Code of Conduct Article II—Academic Honesty

1. Cheating on classroom or outside assignments, examinations, or tests is a violation of this code.

2. Plagiarism, falsification of academic records, and the acquisition or use of test materials without faculty authorization are considered forms of academic dishonesty and, as such, are violations of this code.
3. Because academic honesty and integrity are core values at a university, the faculty finds that even one incident of academic dishonesty seriously and critically endangers the essential operation of the university and may merit expulsion. [rev. 7-98]
4. The operation of UI requires the accuracy and protection of its records and documents. To use, make, forge, print, reproduce, copy, alter, remove, or destroy any record, document, or identification used or maintained by UI violates this code when done with intent to defraud or misinform.
5. All data acquired through participation in UI research programs is the property of the university and must be provided to the principal investigator. In addition, collaboration with the University Research Office for the assignment of rights, title, and interest in patentable inventions resulting from the research is also required [see 5400 A through E].
6. Entrance without proper authority into any private office or space of a member of the faculty, staff, or student body is a violation of this code.
7. It is also a violation to hack or make unauthorized use of any computer or information system maintained by the university or a member of the faculty, staff, or student body. [rev.7-05]
8. Instructors and students are responsible for maintaining academic standards and integrity in their classes. Consequences for academic dishonesty may be imposed by the course instructor. Such consequences may include but cannot exceed a grade of "F" in the course. The instructor should attempt to notify the student of the suspected academic dishonesty and give the student an opportunity to respond. The notice and the opportunity may be informal and need not be in writing. Penalties for any disciplinary infraction must be judicially imposed. [See 1640.02 C-5] [rev. 7-98]
9. Instructors may report incidents of academic dishonesty to the dean of students. Upon receiving such a report, the dean of students shall provide the student with written notice that a report has been made and an opportunity to meet with the dean to discuss the report. The dean of students shall maintain the report and any record of the meeting for a period of time deemed appropriate by the dean. The dean of students may file a complaint against the student after the meeting has taken place or the student has elected, either affirmatively or through inaction, not to meet with the dean. [add. 7-98]

For more information on academic integrity and academic dishonesty, please visit:

<http://www.uidaho.edu/DOS/academicintegrity/Student%20Resources>

#### **Statement of Firearm Regulations (UI):**

The University of Idaho bans firearms from its property with only limited exceptions. One exception applies to persons who hold a valid Idaho enhanced concealed carry license, provided those firearms remain concealed at all times. If an enhanced concealed carry license holder's firearm is displayed, other than in necessary self-defense, it is a violation of University policy. Please contact local law enforcement (call 911) to report firearms on University property.

## TENTATIVE LECTURE SCHEDULE

Date	Day	Topic	Instructor
1-11	M	Introduction, course objectives	Smith
13	W	Structure of cereal grain and legumes	Smith
15	F	Structure of cereal grain and legumes	Smith
18	M	MLK-Day Holiday	
20	W	Varieties of wheat	Smith
22	F	Waxy wheat	Smith
25	M	High amylose wheat	Smith
27	W	Genetic-by-environment variations	Guest
29	F	Grain hardness I	Morris
2-1	M	Grain hardness II	Morris
3	W	Milling I	Smith
5	F	Milling II	Smith
8	M	Cereal proteins- nomenclature and analysis I	Smith
10	W	Cereal proteins- nomenclature and analysis II	Smith
12	F	Cereal proteins- FTIR and NMR analysis	Smith
15	M	Presidents Day Holiday	
17	W	Cereal proteins- functionality I	Smith
19	F	Cereal proteins- functionality II	Smith
22	M	Cereal lipids	Smith
24	W	Cereal carbohydrates I	Smith/Lin
26	F	Cereal carbohydrates II	Smith/Lin
29	M	Cereal non starch polysaccharides	Smith
3-2	W	Chemistry of dough mixing	Smith
4	F	Fermentation, and baking	Smith
7	M	Staling I	Smith
9	W	Staling II	Smith
11	F	Mid-term Exam	Smith
14	M	Spring Break	
16	W	Spring Break	
18	F	Spring Break	
21	M	Journal article review discussion (first 3 articles)	Smith
23	W	Surfactants and enzymes in cereal processing & manuf.	Smith
25	F	Dough rheology	Joyner
28	M	Dough rheology	Joyner
30	W	Soft wheat products I	Smith
4-1	F	Soft wheat products II	Smith
4	M	Malting & brewing	Smith
6	W	Malting & brewing	Smith
8	F	Gluten-free I	Smith

11	M	Gluten-free II	Smith
13	W	"Functional" components of cereals and legumes	Smith
<b>Date</b>	<b>Day</b>	<b>Topic</b>	<b>Instructor</b>
4-15	F	Nutrition I	Guest
18	M	Nutrition II	Guest
20	W	Industrial products	Smith
22	F	Industrial by-products	Smith
25	M	Student term paper presentation an discussion	Smith
27	W	Student term paper presentation an discussion	Smith
29	F	Student term paper presentation an discussion	Smith
5-2	M	Finals week	
4	W	Finals week	
6	F	Finals week	