

**DEPARTMENT OF
FOOD SCIENCE**



UNIVERSITY OF ARKANSAS

**Undergraduate Handbook
2018-2019**

<http://food-science.uark.edu/>

Welcome to Food Science!

Welcome to the Department of Food Science and the University of Arkansas. The Food Science faculty and staff are pleased you have chosen Food Science as your major and we know that you will enjoy this interesting and rewarding discipline. You are joining a nationally recognized program consistently ranked in the top 10 nationally and we are proud to count you among our ranks. Your enrollment in Food Science represents a very important decision in your academic education and professional career development. By completing the B.S.A. degree requirements in this program you will have achieved professional credentials that are nationally recognized. The Food Science curriculum is designed to provide science-based knowledge for competencies important in achieving successful professional careers.

Career opportunities for students with degrees in Food Science are abundant and diverse. The driving force for the diversity of employment opportunities is that U.S. consumers spend over one billion dollars every day for food. The increasing demand for new, safe, high quality and nutritious foods requires educated, energetic and innovative Food Science graduates. With your degree in Food Science you will be a major participant in this exciting field of specialization with opportunities to improve the world's food supply and the health and enjoyment of the global population. There will be many challenges and rewards!

The Department of Food Science is recognized for excellent student advising, student relations and communications. Cathy Hamilton, who you know or will know, serves as our leader for Food Science undergraduate student advising. You can be assured that your course selections and scheduling for successful degree completion are our priorities and that Ms. Hamilton or myself will always be available to provide accurate information. In addition to academic program advising, you will be provided information regarding scholarship, internship and extracurricular opportunities. Please don't hesitate to ask us if you need assistance with anything related with your degree program in Food Science.

The Department of Food Science is fortunate to have faculty who are outstanding teachers and student mentors. The faculty are genuinely concerned that students learn information and develop skills associated with new technologies and scientific knowledge. During your academic program you will have the opportunity to become acquainted with the Food Science faculty. In addition, many students take advantage of part-time employment opportunities to work on research projects with faculty, staff and graduate students in the Department and I encourage you to take advantage of this opportunity to gain hands-on experience.

Extracurricular activities are abundant at the University of Arkansas and I encourage you to participate in those of interest to you. The Food Science Club offers several opportunities outside-the-classroom to have fun, help others and learn. In addition, events such as the College Bowl Competition, Food & Beverage Innovation Competitions and the Ozark section of the Institute of Food Technologists programs are exciting opportunities. There are also opportunities for studies abroad and internships that I strongly encourage you to pursue as such experiences will make you more competitive when you seek employment in the food industry.

We look forward to working with you during your studies and career in Food Science. Our primary mission is to assist you with your education and provide guidance for your future. Please let me or other faculty and staff know of any questions you may have. Again, welcome and congratulations on choosing to major in Food Science!

Wayne Mackay

Wayne Mackay
Interim Department Head

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DEGREES IN FOOD SCIENCE

The general requirements for a Bachelor of Science in Agriculture with a major in Food Science are:

- 120 total credit hours, including: University core requirements (see appendix for rationale behind general education core), Bumpers College requirements, Food Science departmental core requirements and general electives
- 36 credit hours must be in upper division courses (3000 and 4000 level courses)
- 9 credit hours must be within Bumpers College but outside FDSC departmental code
- Minimum GPA of 2.0 on all work attempted at the UA

The Department of Food Science at the University of Arkansas offers three degree concentrations:

Food Science (FDSC) – a challenging science-intensive program designed to prepare the student for employment in research, product development, and graduate school.

Food Technology (FDTN) – provides an integrated background in food science and business or nutrition designed to prepare the student for careers in the food industry. Students on this concentration are required to complete a minor in business or nutrition.

Food & Culinary Sciences (FDCU) – provides an interdisciplinary background in food science and culinary arts designed to prepare the student for a career in product development. The culinary courses required on this concentration are taken through Northwest Arkansas Community College at Brightwater, A Center for the Study of Food in Bentonville, AR or any institution offering equivalent culinary course work.

Specific degree requirements for the three concentrations vary and are outlined in the following pages. The degree check sheets include all requirements to complete the specific concentration. Because our programs require the completion of an internship, typically done in a summer term, students majoring in Food Science are not eligible to participate in the Eight-Semester Degree Completion Program (DCP). Nine-Semester DCP plans have been included in this handbook as they can be useful in determining the typical layout of courses and the course pre-requisites.

**Check Sheet for Food Science Concentration
2018-2019**

STUDENT _____

STUDENT'S ID _____

ADVISOR _____

COMMUNICATIONS (6-12 hours)

- ___ ENGL 1013 Composition I unless exempt (FA, SP, SU)
- ___ ENGL 1023 Composition II unless exempt (FA, SP, SU)

(choose two from the approved list of courses)

- ___ Communication Intensive Course
- ___ Communication Intensive Course

US HISTORY AND GOVERNMENT (3 hours)

(choose one from the following courses)

- ___ HIST 2003 History of American People to 1877 (FA, SP, SU)
- ___ HIST 2013 History of American People to Present (FA, SP, SU)
- ___ PLSC 2003 American National Government (FA, SP, SU)

MATHEMATICS AND STATISTICS (13 hours)

- ___ MATH 1203 College Algebra (FA, SP, SU)
- ___ MATH 1213 Plane Trigonometry (FA, SP, SU)
- ___ MATH 2554 Calculus I (FA, SP, SU)

(choose one from the following courses)

- ___ STAT 2303 Principles of Statistics (FA, SP, SU)
- ___ STAT 2023 Biostatistics (SP)
- ___ AGST 4023 Principles of Experimentation (SP)

PHYSICAL AND BIOLOGICAL SCIENCES (27-31 hours)

- ___ BIOL 1543 & BIOL 1541L Principles of Biology (FA, SP, SU)
- ___ BIOL 2013 & BIOL 2011L General Microbiology (FA, SP, SU)
- ___ PHYS 2013 & PHYS 2011L College Physics I (FA, SU)
- ___ CHEM 1103 & CHEM 1101L University Chemistry I (FA, SP, SU)
- ___ CHEM 1123 & CHEM 1121L University Chemistry II (FA, SP, SU)
- ___ CHEM 3813 Elements of Biochemistry (FA, SP, SU)

(choose one from the following options)

- ___ CHEM 2613 & CHEM 2611L Organic Physiol. Chem. (FA, SP, SU)
- OR
- ___ CHEM 3603 & CHEM 3601L Organic Chemistry I (FA, SU)
- ___ CHEM 3613 & CHEM 3611L Organic Chemistry II (SP, SU)

FINE ARTS AND HUMANITIES (6 hours)

Category A: Fine Arts (choose one from the following courses)

- ___ ARCH 1003 Architecture Lecture (FA, SP)
- ___ ARHS 1003 Art Lecture (FA, SP, SU)
- ___ COMM 1003 Film Lecture (FA, SP, SU)
- ___ DANC 1003 Movement & Dance (FA, SP, SU)
- ___ ENGL 2023 Creative Writing I (FA, SP)
- ___ HUMN 2114H Honors Birth of Modern Culture 1600-1900 (FA)
- ___ LARC 1003 American Landscape (FA, SP)
- ___ MLIT 1003 Experiencing Music (FA, SP, SU)
- ___ MLIT 1333 Popular Music (SP)
- ___ THTR 1003 Theatre Appreciation (FA, SP, SU)
- ___ THTR 1013 Musical Theatre Appreciation (FA, SP)

Category B: Humanities (choose one from the following courses)

- ___ AAST 2023 The African American Experience (FA, SP, SU)
- ___ ARCH 1013 Diversity and Design (SU)
- ___ CLST 1003 Intro to Classical Studies: Greece (FA, odd years)
- ___ CLST 1013 Intro to Classical Studies: Rome (SP, even years)
- ___ COMM 1233 Media, Community and Citizenship (FA, SP)
- ___ ENGL 1213 Introduction to Literature (FA)
- ___ GNST 2003 Intro to Gender Studies (FA, SP)
- ___ HUMN 1124H Honors Equilibrium of Cultures, 500-1600 (SP)
- ___ HUMN 2124H Honors 20th Century Global Culture (SP)
- ___ MRST 2013 Intro to Medieval & Renaissance Studies (FA, even years)
- ___ MUSY 2003 Music in World Cultures (FA, SP)
- ___ PHIL 2003 Intro to Philosophy (FA, SP, SU)
- ___ PHIL 2103 Intro to Ethics (FA, SP, SU)
- ___ PHIL 2203 Logic (FA, SP, SU)
- ___ PHIL 3103 Ethics and the Professions (FA, SP, SU)
- ___ WLIT 1113 World Lit I (FA, SP, SU)
- ___ WLIT 1123 World Lit II (FA, SP, SU)
- ___ Any Intermediate I Foreign Language (FA, SP, SU)

SOCIAL SCIENCES (9 hours)

(choose three from the following courses)

- ___ AGEC 1103 Ag Microeconomics (FA, SP, SU)
- ___ ANTH 1023 Cultural Anthropol (FA, SP, SU)
- ___ ECON 2013 Macroeconomics (FA, SP, SU)
- ___ ECON 2143 Basic Economics (FA, SP, SU)
- ___ GEOS 2003 World Reg. Geography (FA, SP)
- ___ HDF5 2413 Family Relations (FA, SP)
- ___ HIST 1113 World Civ I (FA, SP)
- ___ HIST 2003 Am. History to 1877 (FA, SP, SU)
- ___ HUMN 1114H Honors Roots of Culture to 500 C.E. (FA)
- ___ HUMN 2114H Honors Birth of Modern Culture (FA)
- ___ PLSC 2003 Am. Government (FA, SP, SU)
- ___ PLSC 2203 State & Local Govt. (FA, odd yrs)
- ___ RESM 2853 Leisure and Society (FA, SP, SU)
- ___ SOCI 2033 Social Problems (IR)
- ___ AGEC 2103 Ag Macroeconomics (FA, SP)
- ___ COMM 1023 Comm Diverse World (FA, SP)
- ___ ECON 2023 Microeconomics (FA, SP, SU)
- ___ GEOS 1123 Human Geography (FA, SP, SU)
- ___ HDF5 1403 Life Span Develop (FA, SP)
- ___ HDF5 2603 Rural Families & Commun (SP)
- ___ HIST 1123 World Civ II (FA, SP)
- ___ HIST 2013 Am. History Present (FA, SP, SU)
- ___ PLSC 2013 Comparative Politics (FA, SP, SU)
- ___ PSYC 2003 Psychology (FA, SP, SU)
- ___ SOCI 2013 Sociology (FA, SP, SU)

UNIVERSITY REQUIREMENT (1 hours)

(Required for new freshmen only)

- ___ UNIV 1001 University Perspectives (FA, SP, SU)

FOOD SCIENCE CORE (26 hours)

- ___ FDSC 1011 Exploring Topics in Food Science (FA)
- ___ FDSC 1103 Introduction to Food Science (SP)
- ___ FDSC 3202 Introduction to Food Law (SP)
- ___ FDSC 3103 Principles of Food Processing with lab (FA)
- ___ FDSC 4113 & 4111L Food Analysis and lab (SP)
- ___ FDSC 4304 Food Chemistry with lab (FA)
- ___ FDSC 431V(3) Internship in Food Science (FA, SP, SU)
- ___ FDSC 4413 Sensory Evaluation of Food with lab (FA)
- ___ FDSC 4713 Product Innovation for the Food Scientist with lab (SP)

**ADDITIONAL REQUIREMENTS FOR FOOD SCIENCE CONCENTRATION
(10 hours)**

- ___ NUTR 1213 Fundamentals of Nutrition (FA, SP)
- ___ FDSC 4122 & 4121L Food Microbiology and lab (FA)
- ___ FDSC 4754 Engineering Principles of Food Processing with lab (SP, even years)

ELECTIVES (9-19)

OTHER GRADUATION REQUIREMENTS

120 total semester hours including:
9 hours outside departmental code (FDSC) and within Bumpers College
36 semester hours of 3000/4000 level courses
30 semester hours in Bumpers College at UA
Minimum GPA of 2.00
No more than 35% online or self-paced courses

Dale Bumpers College of Agricultural, Food & Life Sciences
NINE-SEMESTER DEGREE COMPLETION PROGRAM
B.S.A. – Food Science (FDSC)
2018-2019

FDSC Requirements: 6-12 hours Communication; 3 hours History; 13 hours Mathematics and Statistics; 27-31 hours Science; 6 hours Fine Arts/Humanities; 9 hours Social Sciences; 1 hour University Perspectives; 36 hours departmental core; 9-19 hours electives

Bold – Course meets University Core. Pre-requisites, co-requisites, or recommended courses are in parentheses.

Fall Semester Year 1	
Course	Hours
ENGL 1013 Composition I unless exempt	3
MATH 1203 College Algebra	3
BIOL 1543/1541L Principles of Biology	4
UNIV 1001 University Perspectives	1
FDSC 1011 Exploring Topics in Food Science	1
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	15

Spring Semester Year 1	
Course	Hours
ENGL 1023 Comp II (Pre-ENGL 1013) unless exempt	3
MATH 1213 Plane Trigonometry (Pre-MATH 1203 or MATH 1204 with a grade of C or better)	3
CHEM 1103/1101L University Chemistry I (Pre-MATH 1203)	4
FDSC 1103 Introduction to Food Science	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	16

Fall Semester Year 2	
Course	Hours
MATH 2554 Calculus I (Pre-MATH 1213 with grade of C or better)	4
CHEM 1123/1121L University Chemistry II (Pre-CHEM 1103)	4
NUTR 1213 Fundamentals of Nutrition	3
General Elective (FDSC 2603 Science in the Kitchen recommended)	3
Total Semester Hours	14

Spring Semester Year 2	
Course	Hours
Communication Intensive Elective (from approved list)	3
CHEM 2613/2611L Organic Physiological Chemistry (Pre-CHEM 1123/1121L)	4
BIOL 2013/2011L General Microbiology (Pre-BIOL 1543/1541L and CHEM 1103 or CHEM 1123/1121L)	4
Fine Arts/Humanities OR Social Science OR History Core Elective	3
General Elective (FDSC 2701 Food for Health recommended)	1
Total Semester Hours	15

Fall Semester Year 3	
Course	Hours
Statistics Elective – choose from STAT 2303 (Pre-MATH 1203 or MATH 1204 with a C or better), STAT 2023 (Pre-MATH 2554) OR AGST 4023 (Pre-MATH 1203 or higher)	3
PHYS 2013/2011L College Physics I (Pre-MATH 1213)	4
FDSC 4122/4121L Food Microbiology (Pre-BIOL 2013/ 2011L or BIOL 2533)	3
FDSC 4304 Food Chemistry (Pre-CHEM 2613/2611L or CHEM 3603/3601L)	4
Total Semester Hours	14

Spring Semester Year 3	
Course	Hours
Communication Intensive Elective (from approved list)	3
FDSC 3202 Introduction to Food Law	2
FDSC 4113/4111L Food Analysis (Pre-FDSC 4304 and CHEM 2613/2611L or CHEM 3603/3601L)	4
FDSC 4754 Engineering Principles of Food Processing (Pre-PHYS 2013/2011L and MATH 1213)	4
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	16

Summer Year 3	
Course	Hours
FDSC 431V Internship in Food Science (Pre-junior standing)	3

Fall Semester Year 4	
Course	Hours
FDSC 3103 Principles of Food Processing (Pre-CHEM 1123/1121L and MATH 2043 or MATH 2554)	3
FDSC 4413 Sensory Evaluation of Food (Pre-Statistics)	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
General Elective	6
Total Semester Hours	15

Spring Semester Year 4	
Course	Hours
FDSC 4713 Product Innovation for the Food Scientist (Pre-FDSC 4304, FDSC 3103, FDSC 4413, Pre or Co-FDSC 4113/4111L)	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
CHEM 3813 Elements of Biochemistry (Pre-CHEM 2613/2611L or CHEM 3613/3611L)	3
General Elective	3
Total Semester Hours	12
TOTAL HOURS	120

Check Sheet for Food Technology Concentration
2018-2019

STUDENT _____

STUDENT'S ID _____

ADVISOR _____

COMMUNICATIONS (6-12 hours)

- ___ ENGL 1013 Composition I unless exempt (FA, SP, SU)
- ___ ENGL 1023 Composition II unless exempt (FA, SP, SU)

(choose two from the approved list of courses)

- ___ Communication Intensive Course
- ___ Communication Intensive Course

US HISTORY AND GOVERNMENT (3 hours)

(choose one from the following courses)

- ___ HIST 2003 History of American People to 1877 (FA, SP, SU)
- ___ HIST 2013 History of American People to Present (FA, SP, SU)
- ___ PLSC 2003 American National Government (FA, SP, SU)

MATHEMATICS AND STATISTICS (9-12 hours)

- ___ MATH 1203 College Algebra (FA, SP, SU)
- ___ MATH 2043 Survey of Calculus (FA, SP, SU)

(for students declaring AGBS and GBUS minors only)

- ___ MATH 2053 Finite Mathematics (FA, SP, SU)

(choose one from the following courses)

- ___ AGECE 2403 Quantitative Tools for Agribusiness (FA)
- ___ WCOB 1033 Data Analysis and Interpretation (FA, SP, SU)
- ___ STAT 2303 Principles of Statistics (FA, SP, SU)
- ___ AGST 4023 Principles of Experimentation (SP)

PHYSICAL AND BIOLOGICAL SCIENCES (20-23 hours)

- ___ BIOL 1543 & BIOL 1541L Principles of Biology (FA, SP, SU)
- ___ BIOL 2013 & BIOL 2011L General Microbiology (FA, SP, SU)
- ___ CHEM 1103 & CHEM 1101L University Chemistry I (FA, SP, SU)
- ___ CHEM 1123 & CHEM 1121L University Chemistry II (FA, SP, SU)
- ___ CHEM 2613 & CHEM 2611L Organic Physiological Chemistry (SP, SU)

(for students declaring GFNU minor only)

- ___ CHEM 3813 Elements of Biochemistry (FA, SP, SU)

FINE ARTS AND HUMANITIES (6 hours)

Category A: Fine Arts (choose one from the following courses)

- ___ ARCH 1003 Architecture Lecture (FA, SP)
- ___ ARHS 1003 Art Lecture (FA, SP, SU)
- ___ COMM 1003 Film Lecture (FA, SP, SU)
- ___ DANC 1003 Movement & Dance (FA, SP, SU)
- ___ ENGL 2023 Creative Writing (FA, SP)
- ___ HUMN 2114H Honors Birth of Modern Culture 1600-1900 (FA)
- ___ LARC 1003 American Landscape (FA, SP, SU)
- ___ MLIT 1003 Experiencing Music (FA, SP, SU)
- ___ MLIT 1333 Popular Music (SP)
- ___ THTR 1003 Theatre Appreciation (FA, SP, SU)
- ___ THTR 1013 Musical Theatre Appreciation (FA, SP)

Category B: Humanities (choose one from the following courses)

- ___ AAST 2023 The African American Experience (FA, SP, SU)
- ___ ARCH 1013 Diversity and Design (SU)
- ___ CLST 1003 Intro to Classical Studies: Greece (FA, odd years)
- ___ CLST 1013 Intro to Classical Studies: Rome (SP, even years)
- ___ COMM 1233 Media, Community and Citizenship (FA, SP)
- ___ ENGL 1213 Introduction to Literature (FA)
- ___ GNST 2003 Intro to Gender Studies (FA, SP)
- ___ HUMN 1124H Honors Equilibrium of Cultures, 500-1600 (SP)
- ___ HUMN 2124H Honors 20th Century Global Culture (SP)
- ___ MRST 2013 Intro to Medieval and Renaissance Studies (FA, even years)
- ___ MUSY 2003 Music in World Cultures (FA, SP)
- ___ PHIL 2003 Intro to Philosophy (FA, SP, SU)
- ___ PHIL 2103 Intro to Ethics (FA, SP, SU)
- ___ PHIL 2203 Logic (FA, SP, SU)
- ___ PHIL 3103 Ethics and the Professions (FA, SP, SU)
- ___ WLIT 1113 World Lit I (FA, SP, SU)
- ___ WLIT 1123 World Lit II (FA, SP, SU)
- ___ Any Intermediate I Foreign Language course (FA, SP, SU)

SOCIAL SCIENCES (9 hours)

(choose three from the following courses; one course must be outside AGECE/ECON discipline) Students pursuing AGBS minor must choose AGECE 1103; Students pursuing GBUS minor must choose ECON 2143

- ___ AGECE 1103 Ag Microeconomics (FA, SP, SU)
- ___ ANTH 1023 Cultural Anthropol (FA, SP, SU)
- ___ ECON 2013 Macroeconomics (FA, SP, SU)
- ___ ECON 2143 Basic Economics (FA, SP, SU)
- ___ GEOS 2003 World Reg. Geography (FA, SP)
- ___ HDF5 2413 Family Relations (FA, SP)
- ___ HIST 1113 World Civ I (FA, SP)
- ___ HIST 2003 Am. History to 1877 (FA, SP, SU)
- ___ HUMN 1114H Honors Roots of Culture to 500 C.E. (FA)
- ___ HUMN 2114H Honors Birth of Modern Culture (FA)
- ___ PLSC 2003 Am. Government (FA, SP, SU)
- ___ PLSC 2203 State & Local Govt. (FA, SP, SU)
- ___ RESM 2853 Leisure and Society (FA, SP, SU)
- ___ SOCI 2033 Social Problems (IR)
- ___ AGECE 2103 Ag Macroeconomics (FA, SP)
- ___ COMM 1023 Comm Diverse World (FA, SP)
- ___ ECON 2023 Microeconomics (FA, SP, SU)
- ___ GEOS 1123 Human Geography (FA, SP, SU)
- ___ HDF5 1403 Life Span Develop (FA, SP)
- ___ HDF5 2603 Rural Families & Commun (SP)
- ___ HIST 1123 World Civ II (FA, SP)
- ___ HIST 2013 Am. History to Pres. (FA, SP, SU)
- ___ PLSC 2013 Comparative Politics (FA, SP, SU)
- ___ PSYC 2003 Psychology (FA, SP, SU)
- ___ SOCI 2013 Sociology (FA, SP, SU)

UNIVERSITY REQUIREMENT (1 hours)

(Required for new freshmen only)

- ___ UNIV 1001 University Perspectives (FA, SP, SU)

FOOD SCIENCE CORE (26 hours)

- ___ FDSC 1011 Exploring Topics in Food Science (FA)
- ___ FDSC 1103 Introduction to Food Science (SP)
- ___ FDSC 3202 Introduction to Food Law (SP)
- ___ FDSC 3103 Principles of Food Processing with lab (FA)
- ___ FDSC 4113 & 4111L Food Analysis and lab (SP)
- ___ FDSC 4304 Food Chemistry with lab (FA)
- ___ FDSC 431V(3) Internship in Food Science (FA, SP, SU)
- ___ FDSC 4413 Sensory Evaluation of Food with lab (FA)
- ___ FDSC 4713 Product Innovation for the Food Scientist with lab (SP)

ADDITIONAL REQUIREMENTS FOR FOOD TECHNOLOGY CONCENTRATION (18-21 hours)

- ___ FDSC 2503 Food Safety and Sanitation (FA, SP) *OR*
- ___ FDSC 2523 Sanitation and Safety in Food Processing Operations (IR)
- ___ *OR* FDSC 4122 & 4121L Food Microbiology and lab (FA)

(Complete one of the following options)

Option 1: Agribusiness minor (AGBS-m)

- ___ ISYS 1120 Computer Competency Requirements (FA, SP, SU)
- *AGME 2903 may be taken instead of ISYS 1120 (if chosen, hours will be counted as elective hours)
- ___ AGECE 2142 & 2141L Agribusiness Financial Records and lab (FA, SP)
- ___ AGECE 2303 Introduction to Agribusiness (FA, SP, SU)
- ___ AGECE 3303 Food & Agricultural Marketing (FA, SP, SU)
- ___ AGECE 4313 Agricultural Business Management (FA)
- ___ 3000-4000 level business course chosen from departmental codes: *ACCT, AGECE, ECON, FINN, ISYS, MGMT, MKTG, SCMT, or WCOB*

Option 2: General Business minor (GBUS-m)

- ___ ISYS 1120 Computer Competency Requirements (FA, SP, SU)
- ___ ACCT 2013 Accounting Principles (FA, SP, SU)
- ___ MGMT 3563 Management Concepts & Organizational Behavior (IR)
- ___ MKTG 3433 Introduction to Marketing (FA, SP, SU)
- ___ 3000-4000 level Walton College course
- ___ 3000-4000 level Walton College course
- *Departmental codes for Walton College courses are: *ACCT, ECON, FINN, ISYS, MGMT, MKTG, SCMT, or WCOB*

Option 3: General Foods and Nutrition minor (GFNU-m)

- ___ NUTR 1213 Fundamentals of Nutrition (FA, SP)
- ___ NUTR 2112 & 2111L Principles of Foods and lab (FA, SP)
- ___ NUTR 3203 Human Nutrition (SP)
- ___ NUTR 4213 Advanced Nutrition (FA)
- (choose two from the following courses)*
- ___ NUTR 2203 Sports Nutrition (FA, SP)
- ___ NUTR 4223 Life Cycle Nutrition (FA)
- ___ NUTR 4243 Community Nutrition (SP)

NOTE: Students must declare chosen minor with the Bumpers College Dean's Office.

ELECTIVES (10-19)

OTHER GRADUATION REQUIREMENTS

120 total semester hours including:
9 hours outside departmental code (FDSC) and within Bumpers College
36 semester hours of 3000/4000 level courses
Minimum GPA of 2.00
No more than 35% online or self-paced courses

Dale Bumpers College of Agricultural, Food & Life Sciences
NINE-SEMESTER DEGREE COMPLETION PROGRAM
B.S.A. – Food Science (FDSC) – Food Technology (FDTN)
2018-2019

FDSC Requirements: 6-12 hours Communication; 3 hours History; 9-12 hours Mathematics and Statistics; 20-23 hours Science; 6 hours Fine Arts/Humanities; 9 hours Social Sciences; 1 hour University Perspectives; 44-47 hours departmental core; 10-19 hours electives

Bold – Course meets University Core. Pre-requisites, co-requisites, or recommended courses are in parentheses.

Fall Semester Year 1	
Course	Hours
ENGL 1013 Composition I unless exempt	3
MATH 1203 College Algebra	3
BIOL 1543/1541L Principles of Biology	4
UNIV 1001 University Perspectives	1
FDSC 1011 Exploring Topics in Food Science	1
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	15

Spring Semester Year 1	
Course	Hours
ENGL 1023 Comp II (Pre-ENGL 1013) unless exempt	3
CHEM 1103/1101L University Chemistry I (Pre-MATH 1203)	4
FDSC 1103 Introduction to Food Science	3
Business minors only – ISYS 1120 Computer Competency Requirement and MATH 2053 Finite Math (Pre-MATH 1203 with grade of C or better)	3
Nutrition minors only – NUTR 1213 Fundamentals of Nutrition	3
Social Science Core Elective – business minors must choose AGEC 1103 Principles of Ag Microeconomics (Pre- MATH 1203) OR ECON 2143 Basic Economics: Theory & Practice	3
Total Semester Hours	16

Fall Semester Year 2	
Course	Hours
MATH 2043 Survey of Calculus (MATH 1203 with grade of C or better)	3
CHEM 1123/1121L University Chemistry II (Pre-CHEM 1103)	4
Business minors only – AGEC 2142/2141L Agribusiness Financial Records (Pre-ISYS 1120 and AGEC 1103) OR ACCT 2013 Accounting Principles (Pre-ISYS 1120 and MATH 2053 with grade of C or better)	3
Nutrition minors only – NUTR 2112/2111L Principles of Foods (Pre-NUTR 1213 and CHEM 1103)	3
General Elective (FDSC 2603 Science in the Kitchen recommended)	3
FDSC 2503 Food Safety and Sanitation	3
Total Semester Hours	16

Spring Semester Year 2	
Course	Hours
Communication Intensive Elective (from approved list)	3
CHEM 2613/2611L Organic Physiological Chemistry (Pre-CHEM 1123/1121L)	4
Statistics Elective – AGEC 2403 Quantitative Tools for Agribusiness (Pre-AGEC 1103 and MATH 2053) OR AGST 4023 Principles of Experimentation (Pre- MATH 1203 or higher) OR WCOB 1033 Data Analysis and Interpretation (Pre-ISYS 1120 and MATH 2053 with grade of C or better) OR STAT 2303 Principles of Statistics (Pre- MATH 1203 or MATH 1204 with C or better)	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
General Elective (FDSC 2701 Food For Health recommended)	1
Total Semester Hours	14

Fall Semester Year 3	
Course	Hours
BIOL 2013/2011L General Microbiology (Pre-BIOL 1543/1541L and CHEM 1103 or CHEM 1123/1121L)	4
Business minors only – 3000-4000 level business elective OR MKTG 3433 Introduction to Marketing (Pre-ECON 2413 and WCOB 1033)	3
Nutrition minors only – NUTR 4223 Life Cycle Nutrition (Pre-NUTR 1213 and BIOL 2213/2211L)	3
FDSC 4304 Food Chemistry (Pre-CHEM 2613/2611L)	4
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	14

Spring Semester Year 3	
Course	Hours
Communication Intensive Elective (from approved list)	3
Business minors only – [AGEC 2303 Introduction to Agribusiness (Pre-AGEC 1103) AND AGEC 3303 Food & Agricultural Marketing (Pre-AGEC 1103)] OR [MGMT 3563 Management Concepts & Organizational Behavior AND 3000-4000 level business elective]	6
Nutrition minors only – CHEM 3813 Elements of Biochemistry (Pre-CHEM 2613/2611L) and NUTR 3203 Human Nutrition (Pre-NUTR 1213 and CHEM 2613/2611L)	3
FDSC 3202 Introduction to Food Law	2
FDSC 4113/4111L Food Analysis (Pre-FDSC 4304 and CHEM 2613/2611L)	4
Total Semester Hours	15

Summer Year 3	
Course	Hours
FDSC 431V Internship in Food Science (Pre-junior standing)	3

Fall Semester Year 4	
Course	Hours
FDSC 3103 Principles of Food Processing (Pre-CHEM 1123/1121L and MATH 2043 or MATH 2554)	3
FDSC 4413 Sensory Evaluation of Food (Pre-Statistics)	3
Business minors only – AGEC 4313 Agricultural Business Management (Pre-AGEC 2142/2141L and AGEC 2303) OR 3000-4000 level business elective	3
Nutrition minors only – NUTR 4213 Advanced Nutrition (Pre-CHEM 3813 and NUTR 3203)	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
General Elective	3
Total Semester Hours	15

Spring Semester Year 4	
Course	Hours
FDSC 4713 Product Innovation for the Food Scientist (Pre-FDSC 4304, FDSC 3103, FDSC 4413, Pre or Co-FDSC 4113/4111L)	3
Business minors only – General Elective	6
Nutrition minors only – [NUTR 2203 Sports Nutrition (Pre-NUTR 1213) OR NUTR 4243 Community Nutrition (Pre-NUTR 1213)] AND General Elective	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	12
TOTAL HOURS	120

**Check Sheet for Food and Culinary Sciences Concentration (Partnership with NWACC)
2018-2019**

STUDENT _____

STUDENT'S ID _____

ADVISOR _____

COMMUNICATIONS (6-12 hours)

- ___ ENGL 1013 Composition I unless exempt (FA, SP, SU)
- ___ ENGL 1023 Composition II unless exempt (FA, SP, SU)

(choose two from the approved list of courses)

- ___ 3000-4000 level Communication Intensive Course
- ___ 3000-4000 level Communication Intensive Course

US HISTORY AND GOVERNMENT (3 hours)

(choose one from the following courses)

- ___ HIST 2003 History of American People to 1877 (FA, SP, SU)
- ___ HIST 2013 History of American People to Present (FA, SP, SU)
- ___ PLSC 2003 American National Government (FA, SP, SU)

MATHEMATICS AND STATISTICS (9 hours)

- ___ MATH 1203 College Algebra (FA, SP, SU)
- ___ MATH 2043 Survey of Calculus (FA, SP, SU)
- ___ STAT 2303 Principles of Statistics (FA, SP, SU)

PHYSICAL AND BIOLOGICAL SCIENCES (20 hours)

- ___ BIOL 1543 & BIOL 1541L Principles of Biology (FA, SP, SU)
- ___ BIOL 2013 & BIOL 2011L General Microbiology (FA, SP, SU)
- ___ CHEM 1103 & CHEM 1101L University Chemistry I (FA, SP, SU)
- ___ CHEM 1123 & CHEM 1121L University Chemistry II (FA, SP, SU)
- ___ CHEM 2613 & CHEM 2611L Organic Physiol. Chem. (FA, SP, SU)

FINE ARTS AND HUMANITIES (6 hours)

Category A: Fine Arts (choose one from the following courses)

- ___ ARCH 1003 Architecture Lecture (FA, SP)
- ___ ARHS 1003 Art Lecture (FA, SP, SU)
- ___ COMM 1003 Film Lecture (FA, SP, SU)
- ___ DANC 1003 Movement & Dance (FA, SP, SU)
- ___ ENGL 2023 Creative Writing (FA, SP)
- ___ HUMN 2114H Honors Birth of Modern Culture 1600-1900 (FA)
- ___ LARC 1003 American Landscape (FA, SP)
- ___ MLIT 1003 Experiencing Music (FA, SP, SU)
- ___ MLIT 1333 Popular Music (SP)
- ___ THTR 1003 Theatre Appreciation (FA, SP, SU)
- ___ THTR 1013 Musical Theatre Appreciation (FA, SP)

Category B: Humanities (choose one from the following courses)

- ___ AAST 2023 The African American Experience (FA, SP, SU)
- ___ ARCH 1013 Diversity and Design (SU)
- ___ CLST 1003 Intro to Classical Studies: Greece (FA, odd years)
- ___ CLST 1013 Intro to Classical Studies: Rome (SP, even years)
- ___ COMM 1233 Media, Community and Citizenship (FA, SP)
- ___ ENGL 1213 Introduction to Literature (FA)
- ___ GNST 2003 Intro to Gender Studies (FA, SP)
- ___ HUMN 1124H Honors Equilibrium of Cultures, 500-1600 (SP)
- ___ HUMN 2124H Honors 20th Century Global Culture (SP)
- ___ MRST 2013 Intro Medieval & Renaissance Studies (FA, even years)
- ___ MUSY 2003 Music in World Cultures (FA, SP)
- ___ PHIL 2003 Intro to Philosophy (FA, SP, SU)
- ___ PHIL 2103 Intro to Ethics (FA, SP, SU)
- ___ PHIL 2203 Logic (FA, SP, SU)
- ___ PHIL 3103 Ethics and the Professions (FA, SP, SU)
- ___ WLIT 1113 World Lit I (FA, SP, SU)
- ___ WLIT 1123 World Lit II (FA, SP, SU)
- ___ Any Intermediate I Foreign Language (FA, SP, SU)

SOCIAL SCIENCES (9 hours)

(choose three from the following courses)

- ___ AGECE 1103 Ag Microeconomics (FA, SP, SU)
- ___ ANTH 1023 Cultural Anthropol (FA, SP, SU)
- ___ ECON 2013 Macroeconomics (FA, SP, SU)
- ___ ECON 2143 Basic Economics (FA, SP, SU)
- ___ GEOS 2003 World Reg. Geography (FA, SP)
- ___ HDFS 2413 Family Relations (FA, SP)
- ___ HIST 1113 World Civ I (FA, SP)
- ___ HIST 2003 Am. History to 1877 (FA, SP, SU)
- ___ HUMN 1114H Honors Roots of Culture to 500 C.E. (FA)
- ___ HUMN 2114H Honors Birth of Modern Culture 1600-1600 (FA)
- ___ PLSC 2003 Am. Government (FA, SP, SU)
- ___ PLSC 2203 State & Local Govt. (FA, odd yrs)
- ___ RESM 2853 Leisure and Society (FA, SP, SU)
- ___ SOCI 2033 Social Problems (IR)
- ___ AGECE 2103 Ag Macroeconomics (FA, SP)
- ___ COMM 1023 Comm in Diverse World (FA, SP)
- ___ ECON 2023 Microeconomics (FA, SP, SU)
- ___ GEOS 1123 Human Geography (FA, SP, SU)
- ___ HDFS 1403 Life Span Develop (FA, SP)
- ___ HDFS 2603 Rural Families & Commun (SP)
- ___ HIST 1123 World Civ II (FA, SP)
- ___ HIST 2013 Am. History to Present (FA, SP, SU)
- ___ PLSC 2013 Comparative Politics (FA, SP, SU)
- ___ PSYC 2003 Psychology (FA, SP, SU)
- ___ SOCI 2013 Sociology (FA, SP, SU)

UNIVERSITY REQUIREMENT (1 hour)

(Required for new freshmen only)

- ___ UNIV 1001 University Perspectives (FA, SP, SU)

FOOD SCIENCE CORE (26 hours)

- ___ FDSC 1011 Exploring Topics in Food Science (FA)
- ___ FDSC 1103 Introduction to Food Science (SP)
- ___ FDSC 3202 Introduction to Food Law (SP)
- ___ FDSC 3103 Principles of Food Processing with lab (FA)
- ___ FDSC 4113 & 4111L Food Analysis and lab (SP)
- ___ FDSC 4304 Food Chemistry with lab (FA)
- ___ FDSC 431V(3) Internship in Food Science (FA, SP, SU)
- ___ FDSC 4413 Sensory Evaluation of Food with lab (FA)
- ___ FDSC 4713 Product Innovation for the Food Scientist with lab (SP)

**ADDITIONAL REQUIREMENTS FOR CULINARY SCIENCES
CONCENTRATION (24 hours)**

- ___ NUTR 1213 Fundamentals of Nutrition (FA, SP)
- ___ FDSC 2503 Food Safety & Sanitation (FA, SP)
- ___ ORFDST 1013* Food Safety
- ___ FDST 1023* Foundations
- ___ FDST 1033* Sauces
- ___ FDST 1043* Methods
- ___ FDST 1203* Baking
- ___ FDST 1403* Butchery & Charcuterie
- ___ FDST 2003* World Cuisine

*NWACC course codes

ELECTIVES (10-16 hours)

Note: 8 hours must be upper division

OTHER GRADUATION REQUIREMENTS

- 120 total semester hours including:
 - 9 hours outside departmental code (FDSC) and within Bumpers College
 - 36 semester hours of 3000/4000 level courses
- Minimum GPA of 2.00
- No more than 35% online or self-paced courses

Dale Bumpers College of Agricultural, Food & Life Sciences
NINE-SEMESTER DEGREE COMPLETION PROGRAM
B.S.A. – Food Science (FDSC) – Food and Culinary Sciences (FDCU)
2018-2019

FDSC Requirements: 6-12 hours Communication; 3 hours History; 9 hours Mathematics and Statistics; 20 hours Science; 6 hours Fine Arts/Humanities; 9 hours Social Sciences; 1 hour University Perspectives; 50 hours departmental core; 10-16 hours electives

Bold – Course meets University Core. Pre-requisites, co-requisites, or recommended courses are in parentheses. Italicized courses taken at NWACC.

Fall Semester Year 1	
Course	Hours
ENGL 1013 Composition I unless exempt	3
MATH 1203 College Algebra	3
BIOL 1543/1541L Principles of Biology	4
UNIV 1001 University Perspectives	1
FDSC 1011 Exploring Topics in Food Science	1
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	15

Spring Semester Year 1	
Course	Hours
ENGL 1023 Composition II (Pre-ENGL 1013) unless exempt	3
CHEM 1103/1101L University Chemistry I (Pre-MATH 1203)	4
FDSC 1103 Introduction to Food Science	3
FDSC 2503 Food Safety and Sanitation - same as <i>FDST 1013</i>	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
Total Semester Hours	16

Fall Semester Year 2	
Course	Hours
MATH 2043 Survey of Calculus (Pre-MATH 1203 or MATH 1204 with grade of C or better)	3
CHEM 1123/1121L University Chemistry II (Pre-CHEM 1103)	4
NUTR 1213 Fundamentals of Nutrition	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
<i>FDST 1023 Foundations</i>	3
Total Semester Hours	16

Spring Semester Year 2	
Course	Hours
Communication Intensive Elective (from approved list-must be 3000-4000 level course)	3
CHEM 2613/2611L Organic Physiological Chemistry (Pre-CHEM 1123/1121L)	4
BIOL 2013/2011L General Microbiology (Pre-BIOL 1543/1541L and CHEM 1103 or CHEM 1123/1121L)	4
General Elective (FDSC 2701 Food for Health recommended)	1
<i>FDST 1033 Sauces (Pre-FDST 1013 and FDST 1023)</i>	3
Total Semester Hours	15

Fall Semester Year 3	
Course	Hours
STAT 2303 Principles of Statistics (Pre-MATH 1203 or MATH 1204 with grade of C or better)	3
FDSC 4304 Food Chemistry (Pre-CHEM 2613/2611L)	4
General Elective-must be 3000-4000 level course	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
<i>FDST 1403 Butchery & Charcuterie</i>	3
Total Semester Hours	16

Spring Semester Year 3	
Course	Hours
Communication Intensive Elective (from approved list-must be 3000-4000 level course)	3
FDSC 3202 Introduction to Food Law	2
FDSC 4113/4111L Food Analysis (Pre-FDSC 4304 and CHEM 2613/2611L)	4
Fine Arts/Humanities OR Social Science OR History Core Elective	3
<i>FDST 1043 Methods (Pre-FDST 1033)</i>	3
Total Semester Hours	15

Summer Year 3	
Course	Hours
FDSC 431V Internship in Food Science (Pre-junior standing)	3

Fall Semester Year 4	
Course	Hours
FDSC 3103 Principles of Food Processing (Pre-CHEM 1123/1121L and MATH 2554 or MATH 2043)	3
FDSC 4413 Sensory Evaluation of Food (Pre-Statistics)	3
Fine Arts/Humanities OR Social Science OR History Core Elective	3
General Elective-must be 3000-4000 level course	6
Total Semester Hours	15

Spring Semester Year 4	
Course	Hours
FDSC 4713 Product Innovation for the Food Scientist (Pre-FDSC 4304, FDSC 3103, FDSC 4413, Pre or Co-FDSC 4113/4111L)	3
<i>FDST 2003 World Cuisine (Pre-FDST 1043)</i>	3
<i>FDST 1203 Baking</i>	3
Total Semester Hours	9
TOTAL HOURS	120

ADDITIONAL ACADEMIC PROGRAMS

Minors

Students are encouraged to use elective hours to obtain a minor in a particular area of interest. Minors usually require 18-24 hours of coursework and can be chosen from areas of study within Bumpers College, Fulbright College of Arts and Sciences, and Walton College of Business Administration. **If you are interested in pursuing a minor, please contact your advisor as early as possible.** It is important that you declare the minor when you decide. A second advisor from the department of your chosen minor can be consulted to assist you in choosing courses to fulfill your minor requirements.

Common minors for Food Science students include Agricultural Business, General Business, Marketing, Nutrition, Poultry Science, Animal Science, Psychology and Foreign Languages. Requirements for these minors and any other minor you might be interested in can be found in the University of Arkansas Catalog of Studies:

<http://catalog.uark.edu/undergraduatecatalog/>.

For students seeking a major in Food Science through the Food Technology concentration, a minor in Agricultural Business, General Business or Nutrition is required and is achieved with required core course work, thus leaving elective hours available for other courses of interest or to pursue a second minor.

Pre-Professional Programs

Students interested in pursuing pre-professional programs such as pre-medical, pre-pharmacy, and pre-dental can do so as a Food Science major. The Food Science concentration, in particular, is easily adapted to fulfill the requirements to enter medical, pharmacy and dental schools. Students pursuing pre-professional programs will have a pre-professional advisor in addition to a Food Science advisor. If you are pursuing a pre-professional program, it is important that you discuss this with your Food Science advisor. Your advisor's recommendation of courses may be different with this knowledge. Your Food Science and pre-professional advisors will work together to ensure you fulfill your course requirements for both programs.

Honors Program

Qualifying students are encouraged to enter the Bumpers College Honors Program. Minimum qualifications for incoming freshmen are a 28 ACT and 3.50 high school GPA. Current UA students and transfer students require a minimum college GPA of 3.50 on no more than 62 hours of completed course work. Honors students are required to take 9-12 hours of honors coursework, 3-6 hours of honors thesis and maintain a 3.50 cumulative GPA. The student will conduct a research or creative activity in close association with a faculty mentor. The resulting thesis can be published in *Discovery*, the undergraduate research journal published by the Bumpers College or another applicable professional journal. For more information, visit the Bumpers College Honors Program web page at <https://bumpershonors.uark.edu/> or contact Dr. Charlie Rosenkrans, Bumpers College Honors Program Director (crosenkr@uark.edu; 575-4376). To submit an application visit this web page: https://honorscollege.formstack.com/forms/honors_application.

CORE COMPETENCIES IN FOOD SCIENCE

The University of Arkansas is one of only 40 Food Science programs in the United States with a degree plan, the Food Science Concentration, which is approved by the Institute of Food Technologists (IFT), the key international professional society for food scientists. IFT approval imparts a confidence to employers and graduates that a student graduating from an approved program will have attained specific knowledge and skills in the field of Food Science. This approval is based on curriculum requirements that educate students to specific core competencies in Food Science. For students choosing the Food Science Concentration, these core competencies that you should master by graduation are listed below. For students choosing the Food Technology or Food and Culinary Sciences Concentrations, you should master many of these core competencies, but not necessarily all.

Content:	By the Completion of the Food Science Program, Students Should:
<i>Applied Food Science</i>	
<ul style="list-style-type: none">• Integration and application of food science principles (food chemistry, microbiology, engineering/processing, etc.)• Computer skills• Statistical skills• Quality assurance• Analytical and affective methods of assessing sensory properties of food utilizing statistical methods• Current issues in food science• Food laws and regulations	<ul style="list-style-type: none">• Be able to apply and incorporate the principles of food science in practical, real-world situations and problems.• Know how to use computers to solve food science problems.• Be able to apply statistical principles to food science applications.• Be able to apply the principles of food science to control and assure the quality of food products.• Understand the basic principles of sensory analysis.• Be aware of current topics of importance to the food industry.• Understand government regulations required for the manufacture and sale of food products.
<i>Success Skills</i>	
<ul style="list-style-type: none">• Communication skills (i.e., oral and written communication, listening, interviewing, etc.)• Critical-thinking/problem-solving skills (i.e., creativity, common sense, resourcefulness, scientific reasoning, analytical thinking, etc.)• Professionalism skills (i.e., ethics, integrity, respect for diversity)• Life-long learning skills• Interaction skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.)• Information acquisition skills (i.e., written and electronic searches, databases, Internet, etc.)• Organizational skills (i.e., time management, project management, etc.)	<ul style="list-style-type: none">• Demonstrate the use of oral and written communication skills. This includes such skills as writing technical reports, letters, and memos; communicating technical information to a non-technical audience; and making formal and informal presentations.• Define a problem, identify potential causes and possible solutions, and make thoughtful recommendations.• Apply critical-thinking skills to new situations.• Commit to the highest standards of professional integrity and ethical values.• Work and/or interact with individuals from diverse cultures.• Explain the skills necessary to continually educate oneself.• Work effectively with others.• Provide leadership in a variety of situations.• Deal with individual and/or group conflict.• Independently research scientific and nonscientific information.• Competently use library resources.• Manage time effectively.• Facilitate group projects.• Handle multiple tasks and pressures.

Food Chemistry & Analysis

- Structure and properties of food components, including water, carbohydrates, protein, lipids, other nutrients, and food additives
- Chemistry of changes occurring during processing, storage, and utilization
- Principles, methods, and techniques of qualitative and quantitative physical, chemical, and biological analyses of food and food ingredients
- Understand the chemistry underlying the properties and reactions of various food components.
- Have sufficient knowledge of food chemistry to control reactions in foods.
- Understand the major chemical reactions that limit shelf life of foods.
- Be able to use the laboratory techniques common to basic and applied food chemistry.
- Understand the principles behind analytical techniques associated with food.
- Be able to select the appropriate analytical technique when presented with a practical problem.
- Demonstrate practical proficiency in a food analysis laboratory.

Food Safety & Microbiology

- Pathogenic and spoilage microorganisms in foods
- Beneficial microorganisms in food systems
- Influence of the food system on the growth and survival of microorganisms
- Control of microorganisms
- Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow.
- Identify the conditions under which the important pathogens are commonly inactivated, killed, or made harmless in foods.
- Utilize laboratory techniques to identify microorganisms in foods.
- Understand the principles involving food preservation via fermentation processes.
- Understand the role and significance of microbial inactivation, adaptation, and environmental factors (i.e., a_w , pH, temperature) on growth and response of microorganisms in various environments.
- Be able to identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed, or made harmless in foods.

Food Processing & Engineering

- Characteristics of raw food material
 - Principles of food preservation, including low and high temperatures, water activity, etc.
 - Engineering principles, including mass and energy balances, thermodynamics, fluid flow, and heat and mass transfer
 - Principles of food processing techniques, such as freeze drying, high pressure, aseptic processing, extrusion, etc.
 - Packaging materials and methods
 - Cleaning and sanitation
 - Water and waste management
 - Understand the source and variability of raw food material and their impact on food processing operations.
 - Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage.
 - Understand the principles that make a food product safe for consumption.
 - Understand the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings.
 - Be able to use the mass and energy balances for a given food process.
 - Understand the unit operations required to produce a given food product.
 - Understand the principles and current practices of processing techniques and the effects of processing parameters on product quality.
 - Understand the properties and uses of various packaging materials.
 - Understand the basic principles and practices of cleaning and sanitation in food processing operations.
 - Understand the requirements for water utilization and waste management in food and food processing.
-

PROFESSIONAL DEVELOPMENT/DEGREE ENHANCEMENT OPPORTUNITIES

Food Science Club

The Food Science Club is comprised primarily of Food Science undergraduate and graduate students, but it is open to all students across campus. The club's mission is to promote Food Science to the university and community while providing a social atmosphere for its members. Members participate in monthly meetings, fundraisers, social activities and community service projects. Club functions can be a great way to meet UA Food Science students and alumni and to make contacts with local industries.

All Food Science students are automatically members of the Food Science Club. Meetings and club functions are held throughout the year. The FDSC Club traditionally hosts a back to school picnic and an end of the year BBQ along with several other social events. The club also makes and sells apple butter during the fall semester as a club fundraiser. Proceeds from the fund raiser are used to fund their social events, other events and a book scholarship to an active club member each year.

Be sure to watch your uark e-mail for club announcements. *Don't ever let transportation to the club meetings/functions be a reason for not attending.* If transportation is an issue for you, please don't hesitate to contact one of the club officers who will gladly assist in helping you get there and/or get back home. We hope to see you at the first meeting!

More information about the Food Science Club and the current Club Officers can be found at <http://food-science.uark.edu/food-science-club.php>. Feel free to contact any club officer for information or email the club directly at foodscienceclub@gmail.com.

2018-2019 FDSC Club Officers

President	Deandrae Smith	dls005@uark.edu
Vice President	Ana Gonzalez	aigonzal@uark.edu
Secretary	Emily King	eak002@uark.edu
Treasurer	Aubrey Dunteman	anduntem@uark.edu
Activities Coordinator	Asmita Singh	as118@uark.edu

Other UA Campus Organizations, Intramural Sports and Recreational Activities

A diverse variety of Registered Student Organizations (RSOs) are available to you on the UA campus. RSOs include groups such as departmental clubs, special interest clubs, Greek organizations, student government, religious organizations, service/honorary organizations. Visit this website for more information on RSOs: <http://osa.uark.edu/registered-student-organizations/>.

University Recreation (UREC) provides a diverse selection of recreational opportunities for the UA community. Your student fees provide you with a UREC membership that grants access to the Health, Physical Education and Recreation (HPER) building as well as the

UREC Fitness Center in the Arkansas Union. UREC programs include aquatics, club sports, intramural sports, dance classes, self-defense classes, fitness classes, etc. Through UREC you can even rent equipment for outdoor activities like biking, hiking, climbing and camping. Visit this website for more information: <http://urec.uark.edu/>.

Professional Organizations

There are a number of professional organizations relevant to the field of Food Science. Membership in one or more professional organization provides students with access to scholarships, competitive awards, leadership opportunities, travel grants and career centers to aid in the job placement process. Students are encouraged to enhance their professional development by joining national/international organizations. Some examples of organizations relevant to the field of Food Science are:

Institute of Food Technologists (IFT)/IFT Student Association (IF TSA) - www.ift.org and <http://www.ift.org/community/students.aspx>.

Research Chef's Association (RCA) - <http://www.culinology.org/>

International Association for Food Protection (IAFP) - <https://www.foodprotection.org/>.

American Association of Cereal Chemists (AACC) - <http://www.aaccnet.org/Pages/default.aspx> and <http://www.aaccnet.org/MEMBERSHIP/STUDENTASSOCIATION/Pages/default.aspx>

American Oil Chemists Society (AOCS) - <https://www.aocs.org/>

American Society for Nutrition (ASN) - <http://nutrition.org/>

Competitions

Students have the opportunity to participate in a variety of competitions sponsored by the University of Arkansas and a number of outside organizations. Examples of opportunities include:

Quiz Bowl Team – the Food Science Quiz Bowl team is comprised of undergraduate and graduate students who compete at the IF TSA Regional College Bowl Competition each year. Winners of each regional competition then compete in the National College Bowl Competition at the Institute of Food Technologists Annual Meeting and Food Expo. If you are interested in joining the Quiz Bowl Team, contact Cathy Hamilton (hamilton@uark.edu).

Product Development Teams – the Food Science Product Development Teams are comprised of undergraduate and graduate students. These teams work throughout the year to develop products for submission to several product development competitions. The UA Product Development Team has been very successful in competitions over the last several years. If you are interested in joining a Product Development Team contact Cathy Hamilton (hamilton@uark.edu).

Research Paper Competitions – for students choosing to work on a research project with one of our faculty members, there are a number of opportunities to submit the findings in research paper competitions and/or oral and poster competitions. Competitions are available through Gamma Sigma Delta at the UA and through outside organizations such as Ozarks Food

Processors Association and the professional organizations listed above. Students interested in participating in a research project should contact Cathy Hamilton (hamilton@uark.edu), who will help them to locate a faculty member to work with.

Visit the websites above for the professional organizations to see the variety of competitions available through them for food science students. Additionally, announcements for many upcoming competitions are forwarded to students through their uark email, so be sure to read your emails!

Internships

Food Science students are required to participate in an internship at some point during their academic career. An internship is a short-term job for students to gain experience in their chosen field and to apply their Food Science knowledge in a practical situation. While most internships are during the summer, local internships can be done throughout the school year. Participating in an internship makes you a more marketable job applicant, as employers recognize the importance of practical experience.

The Food Science Internship Committee is committed to assisting students in finding internships. Each year the FDSC Internship Committee compiles a booklet containing resumes for students seeking internships and forwards it to prospective employers and various industry contacts. The Committee can often be a good source of industry contacts for students seeking an internship in a specific region. While this resource is available to assist you in locating an internship, *ultimately it is your responsibility to secure your internship*. Additionally, Internship opportunities are announced throughout the year through your uark email and students should also check company websites for internship opportunities.

See “Steps to an Internship” in the Appendix for more detailed information about the internship program.

Study Abroad Opportunities

Studying abroad is a great way to enhance your resume. Many employers recognize the skills that studying abroad can give you – enhanced communication skills, cultural understanding and sometimes knowledge of a foreign language. Many students who study abroad also experience an increase in self-confidence, independence, maturity and the ability to adapt. There are a number of study abroad programs available to you. These programs range from a short summer program to a full semester or even a full year. For more information on study abroad opportunities:

- 1) Visit the UA Office of Study Abroad and International Exchange web site for all available programs for UA students and more study abroad information:
<http://studyabroad.uark.edu/>
- 2) Visit the Bumpers College International Programs website for available programs targeting Bumpers College majors and more study abroad information:
<http://bumpersinternational.uark.edu/index.php>

- 3) Announcements for study abroad opportunities available through other universities are often sent to the Food Science Department. These announcements are forwarded on to students – so watch your uark email for study abroad opportunities.

Be sure to let your academic advisor, Cathy Hamilton (hamilton@uark.edu), know of your intention to study abroad. Planning is very important to ensure you are able to stay on track with your required coursework for your targeted graduation term.

ACADEMIC ADVISING/REGISTRATION - UACONNECT/UASUCCESS

Academic Advising

Bumpers College and the Food Science Department take academic advising very seriously. We feel strongly that students are more successful if they visit with an academic advisor at least once per semester. For this reason, advising holds are placed on all Bumpers College students' student record each semester requiring the student to meet with their advisor before registering for classes.

The academic advisor for the Food Science Department is Cathy Hamilton (hamilton@uark.edu; 575-5299). Students are encouraged to contact Cathy any time they have questions or concerns about their classes and their academic program. For general questions and concerns, feel free to email Cathy or to stop by her office (Food Science Building N113). For academic advising prior to registration, students are required to reserve an advising appointment through UASuccess (see "UA Success Appointment Scheduling" in the Appendix for information on how to schedule an appointment through UASuccess).

Registration

Current UA students are able to register for classes during "Priority Registration". Priority registration typically starts near the first of November for spring classes and the first of April for summer and fall classes. It is recommended that you meet with your advisor before the beginning of Priority Registration so that your advising hold is removed and you are ready to enroll as soon as your enrollment appointment is active (your enrollment appointment is the first day/time you can register for classes for that term). Enrollment appointments are determined based on current standing (freshman, sophomore, junior, senior) and any priority groups you may qualify for (such as honors, athletes, students registered with Center for Educational Access). Students reserve their advising appointment through UASuccess (see "UA Success Appointment Scheduling" in the Appendix for information on how to schedule an appointment through UASuccess).

UASuccess

UASuccess gives you an easy way to schedule the appointments you need with your instructors, advisors and counselors. It also provides you with lists of resources that can help you be successful as a UA student. You can get to UASuccess by going to your Blackboard account and selecting the UASuccess tab.

See "UA Success Appointment Scheduling" in the Appendix for instructions on scheduling appointments through UASuccess with your advisor or instructors.

UAConnect

UAConnect, is your total access for all things related to your student record. You will use UAConnect to enroll in classes, check grades, review your degree audit, pay your student account, apply for graduation and many other tasks. UAConnect help and tutorials are

available on this website: <http://help-uconnect.uark.edu/help-centers/student.php>. Please take the time to review these different UAConnect help files. The information contained in them will be very beneficial for your ability to use UAConnect to its fullest.

Financial Agreement with UA

Each semester before the beginning of priority registration a pre-registration hold will be placed on your student account to update your financial agreement with the UA. This hold will prevent registration until the agreement is completed. Visit UAConnect Help Center (<http://help-uconnect.uark.edu/help-centers/student.php>) for a tutorial on how to remove this hold. The tutorial is located under Student Account, Student Activity Guide.

Holds

In addition to advising and pre-registration holds, other holds may be placed on your student record for various reasons. Some of these holds prevent enrollment in classes. Common examples of holds that prevent enrollment include past due student account and past due parking holds. It is important that you pay attention to your holds and make every effort possible to eliminate any holds before priority registration begins to ensure you are able to enroll, giving you the best opportunity to get the classes you need.

Visit UAConnect Help Center (<http://help-uconnect.uark.edu/help-centers/student.php>) for a tutorial on how to view your holds.

FERPA (Student Rights and Privacy)

The Family Educational Rights and Privacy Act of 1974, also known as FERPA, is a federal law created to protect the privacy of your educational records. With just a few exceptions, all of your educational records are considered confidential and may not be released to anyone without your written consent, including your parents. This protection of your college educational records starts as soon as you enroll in your first class at the UA, regardless of your age.

Please visit this website: <http://registrar.uark.edu/student-records/ferpa/index.php> for information and tutorials on FERPA. This site has information for understanding FERPA for both you and your parents. You will set your FERPA restrictions through your UAConnect student center. Please note that if you do not set up a FERPA 3rd Party Release for your parents, no one at the UA will be permitted to talk with them should an issue arise. For example, if you want your parents to be able to talk to the Treasurer's Office regarding charges on your student account for you and you have not submitted a FERPA 3rd Party Release indicating it is ok to talk to your parents, the Treasurer's Office will not be able to answer their questions. Should you decide to set up a FERPA 3rd Party Release you can choose to release any or all information to that person, or you can specify just certain things that are ok to be released (such as ok to release financial information but not information about attendance or grades).

Parent Center/ParentConnect

Parent Center/Parent Connect allows you to give access to your parent(s) to look at your academic and/or financial information directly through UAConnect, depending on what access you indicate is allowed. The areas you can choose to give your parents access to are

your student account data, grades and class schedule, phone and address information you provided the UA with and financial aid information.

Please note, giving your parent access through Parent Center does not override your FERPA restrictions. If you want your parent to be able to ask someone at the UA questions about the information you gave them access to, you need to also submit a FERPA 3rd Party Release Form.

University of Arkansas Catalog of Studies

The Catalog of Studies is a comprehensive and interactive reference for your years of study. The Catalog gives you valuable information about degree plans and requirements along with information about campus resources, academic regulations, registration information and regulations, and a list and description of every course offered at the UA. The Catalog of Studies is located at this website - <http://catalog.uark.edu/>. Take a few minutes and familiarize yourself with the Catalog and remember that it is a great source of information while you complete your degree.

IMPORTANT UNIVERSITY OF ARKANSAS POLICIES

Academic Probation, Suspension and Dismissal

(as stated in the 2017-2018 Catalog of Studies, <http://catalog.uark.edu/undergraduatecatalog/academicregulations/academicprobationsuspensionanddismissal/>)

A student's academic status at the university is determined at the end of each regular term of enrollment (fall, spring, or summer) on the basis of the student's cumulative and/or term grade-point average (GPA) and number of hours attempted. The student's academic status governs his or her re-enrollment status and determines any conditions associated with re-enrollment or denial of enrollment for a subsequent term. Normally, students are notified of their status individually by the university shortly after the end of each term. However, this policy statement is the formal notification to all students of the conditions that determine academic status and the consequences for each term, regardless of individual notification.

Good Status

Upon initial admission and during a student's first term of enrollment, except for students conditionally admitted on academic probation, the student is in good status. A student remains in, or returns to, good academic status at the end of any regular term (spring, summer, fall) when the cumulative GPA is at or above the required minimum of 2.0.

Academic Probation

When a student's cumulative grade-point average at the end of any fall, spring, or summer term is less than a 2.00 with more than three cumulative hours attempted, the student will be placed on academic probation.

First-Year Freshmen

First-year freshmen who have less than a 2.00 cumulative grade-point average at the end of their first semester of enrollment are considered at risk. During the first six weeks of their second semester, these at risk students must, at a minimum, consult with an academic adviser to develop a plan to get off of probation before being eligible to register for their third semester courses.

Removal from Academic Probation

When a student's cumulative GPA at the end of any fall, spring, or summer term is a 2.00 or above, he or she will be removed from academic probation.

Continuing on Academic Probation

The semester grade point average a student on academic probation must earn to continue on academic probation and avoid academic suspension depends on the cumulative grade hours attempted as outlined in the academic probation chart below.

Probation Chart

Cumulative hours attempted (excludes grades of W)	Placed on Probation if Cumulative GPA Is	Continued on Probation If Semester GPA Is	Removed From Probation If Cumulative GPA Is
4-30 hours attempted	Less than 2.00	Greater than or equal to 1.80	Greater than or equal to 2.00
Greater than 30 hours attempted	Less than 2.00	Greater than or equal to 2.00	Greater than or equal to 2.00

Academic Suspension

A student on academic probation who does not earn the minimum required term GPA will be academically suspended. No student may be academically suspended who has not spent the prior term of enrollment on academic probation. A student on academic suspension will be on academic leave from the university for one major semester (spring or fall) and all contiguous summer and intersessions from the close of the term which resulted in the academic suspension. Thus, a student academically suspended at the end of the spring semester would not be eligible to enroll until the next spring semester; a student academically suspended at the end of the summer semester would not be eligible to enroll until the following spring term; and a student academically suspended at the end of a fall semester would not be eligible to enroll until the next fall semester. The first enrollment when returning from academic suspension may not be in an intersession.

Students who sit out for one major semester after the term of the academic suspension may apply for readmission to the university. A student who does not earn credit from another institution may be readmitted on academic probation following academic suspension. A student who earns credit from another institution(s) during or subsequent to the academic suspension must apply to the university for admission as a transfer student and, if readmitted, will be on academic probation following academic suspension. A student readmitted on academic probation after academic suspension must make a semester grade-point average of at least 2.00 for each semester, (fall, spring, or summer) until he or she is removed from probation. Failure to do so will result in academic dismissal.

Academic Dismissal

A student who returns to the university after an academic suspension is continued on academic probation following suspension and must make a semester grade-point average of at least 2.00 for each fall, spring, or summer term until he or she is removed from academic probation. Failure to do so will result in academic dismissal.

Returning after Dismissal

Students who sit out for at least one full academic year **and** submit at least 12 hours of general education core classes or upper-level classes with at least a 3.0 grade-point average in this coursework will be eligible for automatic readmission from their first academic dismissal. This can be done by taking self-paced courses through the Global Campus¹ at the University of Arkansas or by courses taken at another regionally accredited institution of higher education. Students meeting these requirements must complete a petition to the Academic Standards Committee and submit official transcripts for all work attempted

since being dismissed. The petition is to be submitted to the Office of the Registrar before applying for readmission.

Students who do not meet these conditions, and students who have been academically dismissed more than once, must petition to the Academic Standards Committee to be considered for readmission. It is strongly recommended that students meet with an academic adviser to develop a plan for returning from academic dismissal. Students approved for readmission from academic dismissal must reapply for admission.

A student who reenters the university by favorable action of the Academic Standards Committee after an academic dismissal is continued on academic probation after academic dismissal and must make a semester grade-point average of at least 2.00 for each semester until the cumulative GPA reaches 2.00 and he or she is removed from academic probation. Failure to do so will result in academic dismissal.

Individual colleges or programs have the discretion to set academic admission and continuation standards for specific programs that are higher than university standards.

¹ Students who are not in good academic standing at the University of Arkansas may be enrolled in no more than six hours of self-paced Global Campus courses at any one time.

Academic Integrity Policy

As a University of Arkansas student you are required to be familiar with and to abide by the university's Academic Integrity Policy. Information regarding this policy can be found on this website: honesty.uark.edu. If you ever have questions about how these policies apply to a particular course or assignment you should ask your instructor. A lack of understanding on your part as to what constitutes academic dishonesty can have serious consequences for you. So, be sure to read through all the material on the website above to ensure you understand the policy completely.

SafeAssign is a service that can be used to help spot and prevent plagiarism. SafeAssign is often used by instructors to review papers submitted as assignments for plagiarism by detecting unoriginal content. SafeAssign is also available to you as a student, through Blackboard, to ensure your assignment is properly cited before submitting to your instructor. See "Citing Sources and Avoiding Plagiarism" in Appendix for information on how to use SafeAssign.

Attendance Policy

Regular and attentive attendance in classes is vital to your academic success at the university. Some classes require attendance and class participation by making it part of your overall points for a grade in the class. Some classes do not. Your instructor should include a statement about his/her attendance policy in the syllabus you will receive for their course. If attendance is part of your grade, the number of points available will be noted in the scoring rubric for the course. Regardless of the requirement for attendance, always go to class! Most of your instructors will provide more information in lecture than is available in the material posted on Blackboard and/or your textbook. So if you don't go to class you won't get that

information. Also, if you aren't in class you might miss a pop quiz, or an announcement about a date change for an upcoming test, or an announcement about an opportunity for extra credit. There is a lot you can miss – so go to class!

Your Food Science faculty will very quickly learn who you are. If they don't require attendance in class that doesn't mean they don't notice and don't care when you are not there. Our faculty are very student oriented, your academic success is important to them and they all feel that it is vital that you attend their class regularly to succeed. At some point you will need a letter of recommendation from a faculty member – you should realize that from their perspective, your work ethic in class translates into your potential work ethic in everything else.

There are certain absences that are considered excused. Here is the link to the Attendance Policy for Students in the 2016-2017 Catalog of Studies that addresses excused absences: <http://catalog.uark.edu/undergraduatecatalog/academicregulations/#attendancetext>. The best advice I can give you is to always communicate with your instructors regarding absences you feel should be excused. If you know about the need to miss class ahead of time, communicate with your instructor to confirm he/she considers it excused and how to handle any missed assignments due to the absence. If you are sick you should email your instructor to let them know why you missed class and make arrangements if necessary to make up missed assignments or exams.

Online Credit Hours for On-Campus Undergraduate Students

(as stated in the 2017-2018 Catalog of Studies, <http://catalog.uark.edu/undergraduatecatalog/orientationandregistration/onlinecredit/>)

Any student pursuing an on-campus (face-to-face) undergraduate degree from the University of Arkansas may take up to 35 percent, of the total credit hours required to complete the degree, of regular online (semester/summer) and self-paced online (correspondence) courses for degree credit.

- A freshman (first 30 hours) may take no more than two courses (8 hours) online.
- No student can enroll in more than 12 hours of online courses in any given semester*‡
- For students that have transferred academic credits from other institutions, the percentage of total credit hours obtained at the University of Arkansas through regular (semester/summer) online and self-paced online (correspondence) courses for degree credit cannot exceed 35 percent of the total remaining hours needed to complete the degree after transfer credits are accounted for.
- Exemption from this policy may apply for students in their last semester. All exemption requests must be signed by the department chair and Dean's office that oversee the degree program the student is pursuing.

* For students on financial aid, no more than 6 of these 12 credit hours can come from self-paced online (correspondence) courses. Other financial aid regulations and policies may be applicable on a case by case basis.

‡ International students enrolled full-time are limited to 3 credit hours of online courses per academic term due to federal policies.

FINANCING YOUR EDUCATION

Scholarship Information

Scholarship opportunities are available to current food science students through the UA, Bumpers College, Alumni Association, Food Science Department and several outside organizations. Scholarship opportunities are advertised to you through your uark email address throughout the year as the announcements become available. So watch your email and apply for any scholarships for which you meet the eligibility requirements. You can't receive a scholarship if you don't apply!

There are a number of scholarships available through the UA, Bumpers College, Alumni Association and Food Science Department that have financial need as one of the criteria for the scholarship award. To be eligible for any scholarship with financial need as a criteria, FAFSA information must be on file with the University of Arkansas. If you are not familiar with FAFSA, it stands for Free Application for Federal Student Aid and the form is available on this website: <https://fafsa.ed.gov/>. The information submitted on this form will generate an Estimated Family Contribution (EFC). This EFC can then be used by the scholarship reviewers as an indicator of the applicant's level of financial need.

University-Wide Current Student Scholarships are available each year to current University of Arkansas Students pursuing any major. The application is available online at:

<http://scholarships.uark.edu/current-students/scholarships-for-undergraduates.php>.

Completion of the application requires uploading an academic resume, essay on a topic provided and submission of a letter of recommendation by a UA faculty member, teaching assistant or academic advisor. The deadline to apply is typically February 15. Many of the awards are based on a combination of academic success and involvement, while some are based more on financial need or success despite significant adversity.

Bumpers College Scholarships are available each year to current students pursuing a major within the college. To be eligible for scholarships awarded through the college you must complete the UA University-Wide Scholarship application and all supplemental materials as indicated in the paragraph above. The application deadline is typically February 15.

Information regarding Bumpers College Scholarships is available on this website:

<http://bumperscollege.uark.edu/academics/scholarships-and-financial-aid/index.php>.

Bumpers College scholarship awards are typically based on a combination of academic success and involvement, while some are based more on financial need. Recipients of financial need based Bumpers College scholarships are determined using current FAFSA information at the time that scholarships awards are decided.

Each year, the Department of Food Science awards several scholarships to incoming and current students. To be considered for departmental scholarships you must complete the UA University-Wide Scholarship application and all supplemental materials as indicated in the paragraph above. The application deadline is typically February 15. Departmental scholarship awards are based on a combination of academic success, involvement and financial need. Need is determined by FAFSA information and/or additional scholarship awards.

The Ozark Food Processors Association, an organization of area food processors, awards several scholarships each year to UA students pursuing a Food Science degree. Applications are available online at: <http://ofpa.uark.edu/scholarships.htm>. The application deadline is typically May 31.

Additional scholarships are available through professional organizations such as the Institute of Food Technologists (<http://www.ift.org/community/students/scholarships.aspx>) and the food industry. As information on available scholarships is received throughout the year, the information is forwarded through your uark email address.

Many of these applications require letters of recommendation from faculty and others familiar with your academic performance and/or your character. *Please be courteous and do not wait until the last minute to ask for these letters of recommendation.* Remember that the person agreeing to write the letter is doing you a favor. Set the curve, send it off at least two weeks before the deadline!

Part Time Work Opportunities

Part-time work in the Department of Food Science is often available to interested undergraduate students during the school year and summer months. Faculty members offer a flexible schedule to accommodate classes and exams. Jobs include everything from washing glassware to assisting graduate students with research projects or possibly conducting a research project of your own. Working in a research lab is an excellent opportunity for students, especially for those who wish to continue their education in graduate school. If you are interested in working part-time within the department, please contact Cathy Hamilton (hamilton@uark.edu) for more information on how to locate a job.

Throughout the year, local part-time job opportunities become available. Working part-time for a local food company is great experience for a student. Job announcements are often sent to all FDSC students through their uark email account. Another strategy is to watch local company websites for part-time job openings.

Part time employment opportunities on the University of Arkansas campus can be found on the UA Human Resources website: <https://jobs.uark.edu/>.

For students who have completed the FAFSA and been awarded Federal Work Study, visit this website for information on how to get your work study assignment: http://finaid.uark.edu/work_study_for_students/index.php.

MEET THE FOOD SCIENCE FACULTY

The Department of Food Science faculty is comprised of sixteen extremely talented and highly respected men and women. Each faculty member has a wealth of knowledge and experience in their particular area of interest and Food Science as a whole. Take the time to get to know them, they are a great source of information and advice while making decisions about your future in the field of Food Science. All our faculty have an open door policy and welcome the opportunity to interact with undergraduate students. More information on each faculty member's research program is available on the Food Science Department website (<http://food-science.uark.edu/directory/index.php>)



Wayne Mackay, Interim Department Head
(479) 575-6919; jfmeull@uark.edu; FDSC N202



Griffiths Atungulu, Assistant Professor – Grain Processing Engineering
(479) 575-6843, atungulu@uark.edu, FDSC N-222

Research focuses on engineering effective strategies to maintain grain (rice, corn, soybean and grain-sorghum) quality and prevent mycotoxin development, especially in on-farm, in-bin drying and storage systems.

Teaches: FDSC 2111 Math Elements for Food Science & Technology (SP)
FDSC 4574/5574 Engineering Principles of Food Processing with lab
(SP, even years)



Jamie Baum, Assistant Professor – Nutrition
(479) 575-4474, baum@uark.edu, FDSC N216

Research addresses basic and applied research challenges related to dietary protein intake (e.g. protein source, quality and quantity) and its impact on body composition, energy metabolism and metabolic health using a molecule-to-man approach.

Teaches: FDSC 1011 Exploring Topics in Food Science (FA)
FDSC 2701 Food for Health (SP, co-taught)
FDSC 6023 ST: Regulation of Metabolism (FA, odd years)



Pam Brady, Adjunct Professor
(479) 575-7042; pbrady@uark.edu; FDSC E28

Teaches: FDSC 2523 Food Sanitation & Safety in Food Processing Operations (SP)
FDSC 2603 Science in the Kitchen (FA)



Franck Carbonero, Assistant Professor
(479) 575-6822; fgcarbon@uark.edu; FDSC N-213

Research focus is the impact of diet on the gut microbiome and gut health, phylogenetic and functional diversity of gut microbes, biotransformation of macro and micronutrients by gut microbes and metabolomics.

Teaches: FDSC 4122/5122 & 4121L/5121L Food Microbiology and lab (FA)
FDSC 4333/5333 Molecular Biology Techniques Applied to Nutrition and Food Science (FA)



Phillip Crandall, Professor
(479) 575-7686; crandall@uark.edu; FDSC N213

Research focuses on retail food safety and the use of green technologies that minimize the risk of foodborne pathogens for consumers from farm to fork, and developing novel approaches and solutions for food safety issues from the processing plant through retail.

Teaches: FDSC 4304/5304 Food Chemistry with lab (FA)



Kristen Gibson, Assistant Professor of Molecular Food Safety Microbiology
(479) 575-6844; keg005@uark.edu; FDSC N220

Research focuses on the fate and transport of pathogens within our food systems with a focus on human noroviruses and fresh produce as well as retail food safety.

Teaches: FDSC 3202 Introduction to Food Law (SP)
FDSC 5223 Biosecurity in the Food Industry (FA, even years)
FDSC 5423 Foodborne Diseases (SU, odd years)
FDSC 5503 Food Industry Sanitation (SU, even years)
FDSC 5823 Principles of Food Microbiology (Fall, even years)
FDSC 6403 Epidemiologic Principles in Food Safety and Public Health (FA, odd years)



Navam Hettiarachchy, University Professor
(479) 575-4779; nhettiar@uark.edu; FDSC N218

Research focuses on basic and applied food proteins and peptides with an integrated approach to value addition in nutraceuticals, natural antioxidants, and antimicrobials from Arkansas-grown crops, and industry co-products.

Teaches: FDSC 4713/5713 Food Product & Process Development with lab (SP)
FDSC 6323 Nutraceuticals and Functional Foods (SP, even years)
FDSC 6333 Food Protein Chemistry & Functionality (SP, odd years)



Luke Howard, Professor
(479) 575-2978; lukeh@uark.edu; FDSC N206

Research focuses on improving the awareness of the nutritional quality of fresh and processed plant-based foods. The goal is to ultimately improve human nutrition through the enhancement of existing products and development of new value-added products with disease-preventative and health-promoting benefits.

Teaches: FDSC 1103 Introduction to Food Science (SP)
FDSC 6033 Food Biochemistry (SP, even years)



Sun-Ok Lee, Assistant Professor of Nutrition
(479) 575-6921; sunok@uark.edu; FDSC N211

Research focuses on how dietary phytochemicals and bioactive components in foods and natural extracts exert human health benefits (e.g. prevention of chronic diseases such as cardiovascular disease, cancer, diabetes and obesity). Also focuses on gut microbial metabolism of dietary phytochemicals and food toxicology.

Teaches: FDSC 2701 Food for Health (SP, co-taught)
FDSC 6443 Metabolism of Xenobiotics (FA, even years)



Rubén Morawicki, Assistant Professor
(479) 575-4923; rmorawic@uark.edu; FDSC E13

Research focuses on developing the use of processing techniques to improve the long term sustainability of the food supply chain.

Teaches: FDSC 3103 Principles of Food Processing with lab (FA)
FDSC 6143 Advanced Food Processing (SP, even years)



Andrew Proctor, University Professor
(479) 575-2980; aproctor@uark.edu; FDSC N204

Research focuses on basic and applied research problems related to food oils, fats and associated products, including the development of lipid-based functional foods and enhancing the health-promoting properties of vegetable oil products for use in food, feed and pharmaceutical applications.

Teaches: FDSC 431V/531V Internship in Food Science (FA, SP, SU)



Steven Ricke, Professor
(479) 575-4678; sricke@uark.edu; FDSC E27

Research focuses on understanding the mechanisms of foodborne bacterial pathogen contamination (specifically *Salmonella*, *Listeria* and *Campylobacter*) in all phases of food production and develop a more integrated control effort.



Han-Seok Seo, Assistant Professor
(479) 575-4778, hanseok@uark.edu, N215

Focus is on basic and applied research to address a better understanding of the role of sensory aspects in food perception and acceptance. Additionally, research is designed to enhance knowledge and background of sensory disorder induced food perception and eating behavior.

Teaches: FDSC 4413/5413 Sensory Evaluation of Food with lab (FA)
FDSC 602V ST: Chemosensory Perception and Measurement (FA, odd years)



Terry Siebenmorgen, Distinguished Professor
(479) 575-2841; tsiebenm@uark.edu; FDSC N217

Research focuses on developing improved rice drying systems that minimize milling and functional quality deterioration, maximizing drying capacity and maximizing drying energy efficiency using mathematical model development, laboratory testing and field validation approaches.

Teaches: FDSC 4754/5754 Engineering Principles of Food Processing with lab
(SP, even years)



Renee Threlfall, Research Scientist
(479) 575-4677; rthrelf@uark.edu, FDSC B3

Research focuses on specialty crops with expertise in enology and viticulture (winemaking and grape growing), as well as the processing of small fruits (grapes, blackberries, strawberries, peaches, etc.).

Teaches: FDSC 2401/2401H Uncorked: Vines to Wines (FA)



Ya-Jane Wang, Professor
(479) 575-3871; yjwang@uark.edu; FDSC N214

Research focuses on enhancing utilization and performance of carbohydrate-rich bioresources in a variety of food, pharmaceutical and industrial applications.

Teaches: FDSC 4113/5113 & 4111L/5111L Food Analysis and lab (SP)
FDSC 6123 Food Carbohydrate Chemistry (FA, even years)

IMPORTANT CONTACT INFORMATION

Department of Food Science

(<http://food-science.uark.edu/>; 2650 N Young Ave)

Department Head	Dr. Wayne Mackay makay@uark.edu	575-6919 N-202
Academic Advisor	Cathy Hamilton hamilton@uark.edu	575-5299 N-113
Student Relations Coordinator	Rosa Buescher rosab@uark.edu	575-2682 N-201
Internships	Dr. Andy Proctor aproctor@uark.edu Cathy Hamilton hamilton@uark.edu	575-2980 N-204 575-5299 N-113
Employment	Cathy Hamilton hamilton@uark.edu	575-5299 N-113
Scholarships	Phil Crandall crandal@uark.edu	575-7686 N-213
Office Staff	Connie Tharel ctharel@uark.edu Megan White mw047@uark.edu	575-4450 N-201 575-4455 N-201

Dale Bumpers College of Agricultural, Food and Life Sciences

(<http://bumperscollege.uark.edu/>; AFLS E-108; aflsdean@uark.edu)

Dean			
Dr. Deacue Fields III	dcfields@uark.edu	575-2252	AFLS E202
Associate Dean for Academics			
Dr. Lona Robertson	lrobert@uark.edu	575-2252	AFLS E202
Coordinator of Student Retention & Curriculum			
Vicky Watkins	watkinsv@uark.edu	575-2121	AFLS E202
Director of Advising & Student Records			
Jody Davis	kdavis@uark.edu	575-7758	AFLS E202
Project Director for Scholarships and External Relations			
Kaitlin Gragnano	gragnano@uark.edu	575-2596	AFLS E202
Honors Program Director			
Dr. Charles Rosenkrans, Jr.	crosendr@uark.edu	575-4376	AFLS E202
Director of International Programs			
Dr. Lisa Wood	lswood@uark.edu	575-6770	AFLS E221

University of Arkansas

Office of Admissions - http://admissions.uark.edu/uofa@uark.edu	Silas Hunt Hall 232	575-5346
Office of the Registrar/Campus Office - http://registrar.uark.edu/registra@uark.edu	Silas Hunt Hall 146	575-5451
Office of the Registrar/Main Office - http://registrar.uark.edu/registra@uark.edu	Uptown East 141 1083 East Sain Ave.	575-5451
Financial Aid - http://finaid.uark.edu/finaid@uark.edu	Silas Hunt Hall 114	575-3806
Academic Scholarship Office - http://scholarships.uark.edu/scholars@uark.edu	Silas Hunt Hall 114	575-4464
University Housing - http://housing.uark.edu/housing@uark.edu	960 W. Douglas St.	575-3951
Testing Services - http://test.uark.edu/testing@uark.edu	97 N. Razorback Rd.	575-3948
Pat Walker Health Center - http://health.uark.edu	525 N. Garland Ave.	575-4451
Career Development Center - http://career.uark.edu/new/	Arkansas Union 607	575-2805
University Bookstore - http://www.uofastore.com/	616 N. Garland Ave.	575-2155
International Admissions - http://international-admissions.uark.edu/iao@uark.edu	Gearhart Hall 213	575-6246
International Students & Scholars - http://international-students.uark.edu/iss@uark.edu	Holcombe Hall 104	575-5003
Class+ Center for Learning and Student Success - http://class.uark.edu/class@uark.edu	Gregson Hall 040B	575-2885

ACADEMIC RESOURCES

Class+ Center for Learning and Student Success

<http://class.uark.edu/>

Gregson Hall 040B
575-2885; class@uark.edu

Tutoring is available through Class+ at Gregson Hall and the Multicultural Center to *all* UA students and is *free* of charge. Tutoring is available in many areas including basic science courses (such as chemistry, physics and biology), math courses and foreign language courses.

Supplemental instruction is also available through Class+ for historically difficult courses (such as chemistry and biology). Basically supplemental instruction is out-of-class review sessions led by experienced students who excel in the difficult subject matter. These students know the course content and are anxious to help you through it. These sessions enable students to compare notes, discuss reading assignments, develop organizational tools and predict and work through test questions.

Class+ additionally offers *academic coaching* and other *tools and resources* that are designed to help participants realize their academic potential. Visit this link for the resources available to you at the click of the mouse: <http://class.uark.edu/academic-support/tools-and-worksheets.php>.

Please visit the Class+ web site above for more information and for hours of operation.

+Writing Support

<http://class.uark.edu/>

Gregson Hall 040, Kimpel Hall 315, and Mullins Library
575-6747; writcent@uark.edu

The ability to communicate in writing is vital to your success academically and professionally. Assistance in developing writing skills is available through +Writing Support. This resource is available to *all* UA students and is *free* of charge. You can receive assistance with any writing assignment through one-on-one tutoring or you can upload your paper for online feedback.

Center for Educational Access

<http://cea.uark.edu/>

ARKU 209
575-3104; ada@uark.edu

Adjusting to a university setting presents many challenges for new students, especially for those with disabilities. The University of Arkansas in Fayetteville makes every effort to offer equal educational opportunities for all students and is committed to improving the total university experience for students with disabilities.

The Center for Educational Access (CEA) serves as the central campus resource for helping students with disabilities obtain the accommodations they need for equal access to classroom activity. The CEA provides direct support for students with disabilities and training and educational resources to the University community as a whole. The university also

consults with the CEA about ways to build the technological infrastructure to maximize the accessibility of the institution's programs, services, and activities.

In partnership with students, faculty, and staff, CEA staff members work with students individually and assist academic units to determine reasonable accommodations that will enable every student to have access to the full range of programs and services.

Student Support Services

<http://sss.uark.edu>

Gregson Hall 008
575-3546

The University of Arkansas Student Support Services (SSS) is a federally funded program created to increase retention and graduation rates. SSS provides several services designed to ensure students are successful at the UA including tutoring and assistance in goal setting, study skills, career and graduate school instruction and mentorship opportunities.

To qualify for this service a student must have an academic need *and* be a first generation college student or qualify for federal financial aid or have a documented disability. Students who meet the above eligibility requirements are encouraged to apply for participation in the programs sponsored by SSS.

Please visit the SSS web site for more information and application instructions.

Counseling and Psychological Services (CAPS)

<http://health.uark.edu/counseling/index.php>

Pat Walker Health Center
575-5276

Through CAPS students can work with clinical staff to help resolve problems they are having while here at the UA and learn to develop healthier and more satisfying relationships with friends and family. Services are provided by licensed psychologists, counselors and social workers. Some issues that clinicians work with frequently include adjusting to college life and the loneliness of homesickness; self-esteem; anxiety or confusion about dating and sexuality; decision making; depression; and relationship problems. The goal is to allow people the greatest opportunity to benefit from the university experience, both by avoiding and solving problems and by enhancing the personal growth possible during college.

Emergency services are provided by CAPS 24-hours a day and year round. Staff is on call to deal with situations that require immediate attention. To contact the professional on call, simply call 575-5276.

TRANSPORTATION INFORMATION

Many Food Science courses are held in the classroom, teaching laboratory, or pilot plant facilities here in the Food Science building. Since the Food Science building is located off campus proper at the Arkansas Agricultural Research and Extension Center (AAREC), transportation plans need to be considered when preparing class schedules. Whenever possible, it is best to avoid scheduling a class immediately before or after any Food Science course held in the Food Science Dept. Obviously this approach is not always possible, in which case it is very important that you discuss this issue with your instructors prior to the beginning of the semester.

There are a couple of transportation options for students taking courses in the Food Science building. First, parking is available at the Food Science building without the need of a permit. The AAREC is approximately 2 ½ miles north of campus on Garland Ave so many students drive their personal vehicles to attend classes in the department. Frequently, students who either do not have their own transportation or who will have difficulty with parking on return to campus carpool with other students enrolled in the course.

Another option is the UA transit system. The transit bus stops across the street from the Food Science building on a very regular route. Please check the Transit and Parking web page for routes and departure times (<http://parking.uark.edu/transit-services/transit-operations/index.php>).

APPENDIX

UA SUCCESS-APPOINTMENT SCHEDULING

Scheduling an appointment with your instructor for office hours:

1. Login to Blackboard
2. Click the **UASuccess** link in the upper right hand corner
3. Click on the **Home** link at the top of the UASuccess page
4. Under the **Courses I'm Taking** section, you will see your instructors listed. Click on **See available appointments** to schedule an appointment.
5. Click on one of the bold dates on the calendar to see dates for available office hours.
6. Click on the **Sign Up** icon once you find a date and time that works for your schedule.
7. A new window will appear to "Add Appointment".
 - a. Select a **Reason** (Ex. Course tutoring)
 - b. Enter a **Detailed Description** of why you are scheduling the appointment
 - c. Select the **Course**
 - d. Click **Submit**
 - e. The instructor's calendar should now list your name in the time slot selected
8. Click on the **Home** link at the top.
9. You should see your appointment in the **Appointments** section
 - a. If you need to make any changes to your appointment, click on the calendar icon next to your appointment.

Scheduling an appointment with your assigned advisor:

1. Login to Blackboard
2. Click the **UASuccess** link in the upper right hand corner
3. Click on the **Home** link at the top of the UASuccess page
4. Under the **My Success Network** section, you will see your advisor listed. Click on **See available appointments**.
5. Click on one of the bold dates on the calendar to see dates for available office hours.
6. Click on the **Sign Up** icon once you find a date and time that works for your schedule.
7. A new window will appear to "Add Appointment".
 - a. Select a **Reason** (Ex. Academic Advising)
 - b. Enter a **Detailed Description** (Ex. Discuss spring 2017 schedule)
 - c. Click **Submit**
 - d. The advisors calendar should now list your name in the time slot selected
8. Click on the **Home** link at the top.
9. You should see your appointment in the **Appointments** section
 - a. If you need to make any changes to your appointment, click on the calendar icon next to your appointment.

For students finding additional resources on campus:

1. Click on the **Success Network** link at the top of UASuccess. This will pull up a list of Services.
 - a. You can either scroll through the list of services or type a keyword in the search box on the upper right hand side under your name.
2. When the results display, click on the link for the service you need.
3. If there are Service Members displayed that have entered office hours, click the **Schedule Online** link to schedule an appointment.
4. Follow steps 5-9 from above to schedule an appointment

RATIONALE FOR UA GENERAL EDUCATION CORE

(This explanation for the rationale behind the general education core required for all students pursuing a degree at the University of Arkansas was extracted from the Catalog of Studies (<http://catalog.uark.edu/undergraduatecatalog/>). A list of courses that fulfill each core requirement are located on your check sheet and also in the Catalog of Studies.)

In order to prepare its students for lives of the highest individual quality and the greatest potential contribution to the making of a better world, the University of Arkansas has developed a comprehensive program of general education. Although the basic skills, knowledge, methodologies, and judgments derived from experience in the core area set forth here may provide the basis for a major or professional concentration, the aims of these core requirements are not career specific. Rather, the following areas are designed to develop the tools for critical thinking and effective communication, an understanding of our richly diverse human heritage, the flexibility to adapt successfully to a rapidly changing world, a capacity for lifelong learning, and an enthusiasm for creativity.

English/Communication (6 hours) – Courses offered in this area are designed to develop the ability to organize ideas and to communicate them in grammatically correct written English with clarity, precision, and syntactical maturity. Freshman English courses taken at other universities will satisfy this requirement only if they are courses in composition.

Fine Arts/Humanities (6 hours) – Courses presented in this area are drawn from the study of human thought, emotion, values, culture, and aesthetics. They are designed to develop the capacity for reflection, an appreciation of our own diverse culture and a tolerance of those foreign to us, and a heightened aesthetic and ethical sensibility. The courses are not performance-based, but offer students a basis for the gradual acquisition of broad cultural literacy.

Mathematics (3 hours) – Courses offered in this area are designed to develop the student's ability to understand the diverse mathematical concepts that shape our increasingly technical culture. Core mathematics courses presuppose the ability to apply mathematical techniques at the level of high school algebra and geometry. The specific course(s) selected will depend upon each student's curriculum, but no course below college algebra may be used to fulfill core requirements.

Science (8 hours) – A primary goal of these courses is to develop an appreciation of the basic principles that govern natural phenomena and the role of experiment and observation in revealing these principles. Students should acquire an understanding of the relationship between hypothesis, experiment, and theory, and develop the skills common to scientific inquiry, including the ability to frame hypotheses and defend conclusions based on the analysis of data. These courses are designed to prepare a student for informed citizenship by illustrating the importance of science and technology to the present and future quality of life and the ethical questions raised by scientific and technological advances.

Social Science (9 hours) – The purpose of the social science core is to introduce students to the breadth of inquiry in the social sciences—such as the study of ideas, the behavior of

individuals, groups, institutions, and their interactions. The core should expose students to the history of and the challenges encountered in our complex, culturally diverse world.

American History and Civil Government (3 hours) – Under Arkansas law, no undergraduate degree may be granted to any student who has not passed a college course in American history and civil government.

CITING SOURCES AND AVOIDING PLAGIARISM

(These instructions for using SafeAssign were extracted from the following website:
https://techarticles.uark.edu/blackboard_students/citing_sources_and_avoiding_plagiarism/)

SafeAssign is a tool in Blackboard Learn that allows you and your faculty member to submit and check your papers for proper citation. You can also submit your original paper as a draft to check for proper citation before turning it in for grading.

Submit SafeAssignment for a Course

When your faculty member requires you to submit your paper or other assignment using SafeAssign:

Log into learn.uark.edu with your UARK username and password. Click your course.

In the course menu on the left, click the area where the assignment is located.

Click the name of the assignment.

Click Browse My Computer and select the file to attach. Click Open.

(Optional) Choose to submit your paper to the database.

Click Submit. Verify that your file uploaded by checking for the confirmation message at the top of the page.

Self-enroll to Submit Papers in SafeAssign

Submit your papers to SafeAssign to check your paper for proper citation without or before being required by a faculty member by self-enrolling in the SafeAssign course in Blackboard Learn.

To self-enroll in the SafeAssign course:

Log into Blackboard at learn.uark.edu with your UARK username and password.

Click the Courses tab.

In the Course Catalog list on the right, click SafeAssign.

Mouse over the Course ID "student.safeassign" and click the down arrow. Select Enroll.

Click Submit on the Self Enrollment page.

To submit a draft and check your paper for proper citation before turning it in to be graded:

Ensure you are enrolled in the SafeAssign course (see above).

Log into learn.uark.edu with your UARK username and password.

Click the SafeAssign course. Click Submission Area.

Click the SafeAssign "SUBMIT HERE" link.

Click Browse My Computer and select the file to attach. Click Open.

Click Submit. Verify that your file uploaded by checking for the confirmation message at the top of the page.

Check your submissions by clicking the SafeAssign "SUBMIT HERE" link. Access your originality report by clicking the drop-down menu under Assignment Details. SafeAssign reports are generated in a few minutes, showing the matching percentage results and source list.

FOOD SCIENCE COURSE DESCRIPTIONS

FDSC 1011 Exploring Topics in Food Science (Fa) – Introduces the depth and scope of Food Science as a profession. This course emphasizes the importance of science in processing and preservation of food and discusses current topics and issues. Practical information on food processing, composition, additives, labeling, environmental issues, regulations, safety, sensory analysis, and health benefits will be provided. Curriculum offerings in Food Science will be related to job responsibilities as a Food Scientist. Lecture/discussions, 2 hours per week for 8 weeks.

FDSC 1103 Introduction to Food Science (Sp) – This course is designed to provide students with a general application and understanding of current issues associated with food products and food ingredients. Discussions will focus on controversial subjects involving food products, food additives, food safety and preservation techniques based on scientific principles and popular belief. Lecture/discussions/demonstrations, 3 hours per week.

FDSC 2111 Math Elements for Food Science and Technology (Sp) - Basic data interpretation and analysis, problem interpretation and equation formulation, manipulation of algebraic functions representing applications in food science and technology, predictive models and curve fittings to determine model constants applied in food science and processing. Pre- or Co-requisite: MATH 2043 or MATH 2554.

FDSC 2401/2401H Uncorked: Vines to Wines (Fa) – This introductory course is designed to provide students with an understanding of the basic concepts of growing grapes and winemaking, including history, grape growing, cultivars, chemistry, wine microorganisms, fermentation, winery operations, wine marketing, and the sensory and appreciation of wine. Coursework is expected to integrate lecture and guest presenters with supplement reading assignments. Lecture 2 hours per week for 8 weeks.

FDSC 2523 Sanitation and Safety in Food Processing Operations (Sp) – Topics to be covered include understanding and control of microbial, chemical and physical food hazards as well as emerging food safety issues. Course will include a study of cleaners and sanitizers and sanitary equipment and plant designs. Bioterrorism and food safety will also be discussed. Web-based course. Students may not receive credit for both FDSC 2503 and FDSC 2523.

FDSC 2603 Science in the Kitchen (Fa) – In recent years science has found its way into the kitchen and cooking into laboratories and food processing plants. This course is designed to integrate science and cooking to help students appreciate the chemical and physical properties of foods and understand how the processes used when handling, preparing, and storing foods affect these properties. Lecture 3 hours per week.

FDSC 2701 Food for Health (Sp) – The course is designed for students interested in how foods affect one's health. This course provides students with a background of functional food that will enable them to understand, discuss, and evaluate functionality of food in relation to health. This class is designed to appeal to students studying food science, nutrition, biology, chemistry, nursing, and health and human performance. Lecture 2 hours per week for 8 weeks.

FDSC 3103 Principles of Food Processing with Lab (Fa) – Course is designed as an overview of the unit, food processing operations common to all types of food processing plants. Examples will be drawn from international food processing operations, processing fruits and vegetables, poultry and meats, oil seeds and cereal grains. Emphasis on oral communication and critical thinking skills. Lecture 2 hours per week and Laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: CHEM 1123/1121L and MATH 2043 or MATH 2554.

FDSC 3202 Introduction to Food Law (Sp) – Discussion of government laws and regulations affecting the manufacture of food. Emphasis is on federal regulations relating to food safety, labeling, and the FDA. Discussion relates to practical use of food law. Lecture 2 hours per week.

FDSC 400V Special Problems (Fa, Sp, Su) – Investigation of assigned problems in food science. Prerequisite: Junior standing.

FDSC 4113 Food Analysis (Sp) – Methods of analysis, instrumentation, and laboratory techniques for measuring the chemical composition of raw and value added food products. Lecture 3 hours per week. Corequisite: FDSC 4111L. Prerequisite: FDSC 4304 and CHEM 2613/2611L or CHEM 3603/3601L.

FDSC 4111L Food Analysis Lab (Sp) – Laboratory exercises providing students with experience of analytical techniques and instrumentation used in food analysis. Laboratory 3 hours per week. Corequisite: FDSC 4113. Prerequisite: FDSC 4304 and CHEM 2613/2611L or CHEM 3603/3601L.

FDSC 4122 Food Microbiology (Fa) – The study of food microbiology including classification/ taxonomy, contamination, preservation and spoilage of different kinds of foods, pathogenic microorganisms, food poisoning, sanitation, control and inspection and beneficial uses of microorganisms. Lecture 2 hours per week. Prerequisite: BIOL 2013/BIOL 2011L or BIOL 2533.

FDSC 4121L Food Microbiology Lab (Fa) – A hands-on laboratory course designed to teach students microbiological techniques and certain enumeration and plating techniques of specific food spoilage and pathogenic bacteria. Laboratory 4 hours per week. Co- or Prerequisite: FDSC 4122.

FDSC 4304 Food Chemistry with Lab (Fa) – Water, carbohydrates, lipids, proteins, vitamins, and minerals in foods; biochemical and functional properties, enzymes, food additives (emulsifiers, pigments, colors, flavors, preservatives, and sweeteners), and texture as related to properties in food systems and during processing. Lecture 3 hours per week and Laboratory 4 hours per week. Corequisite: Lab component. Prerequisite: CHEM 2613/CHEM 2611L (or CHEM 3603/3601L).

FDSC 431V Internship in Food Science (1-4) (Fa, Sp, Su) – 1-4 hours credit possible. A supervised practical work experience in the food industry or a governmental or industrial organization having direct impact on the food science area in order to gain professional competence and insight to employment opportunities. May be repeated for total of 6 hours credit.

FDSC 4333 Molecular Biology Techniques Applied to Nutrition and Food Science (Fa) - This course will provide advanced knowledge on current molecular biology techniques and

how they can be used in nutrition and food science. A specific emphasis will be given on learning how to understand and interpret results generated through these methods. Therefore, the course is of interest to a wider audience, as such analytic skills are valuable for a diverse array of disciplines. Methods covered will include DNA and RNA-based techniques (PCR, microarrays, sequencing, genomics and metagenomics), protein-based techniques (blots, proteomics) and other molecules-based techniques (metabolomics, immunoblots). Lecture 3 hours per week. Prerequisite: Junior or senior standing.

FDSC 4413 Sensory Evaluation of Food with Lab (Fa) – Principles and procedures for sensory evaluation of food. Appropriate uses of specific tests will be discussed, along with physiological, psychological, and environmental factors affecting sensory verdicts. Lecture 2 hours per week and Laboratory 2 hours per week. Corequisite: Lab component. Prerequisites: STAT 2303 or WCOB 1033 or STAT 2023 or AGST 4023 or PSYC 2013.

FDSC 4713 Product Innovation for the Food Scientist with Lab (Sp) – This is a capstone course integrating knowledge developed in Food Science to the development of new food products. This course will take an integrated multidisciplinary approach to developing innovative food products and will provide learning experiences in new product development and Research & Development. Topics include product formulation, ingredient interactions, sensory analysis, packaging, labeling, food safety and food law. Lecture 2 hours per week and Laboratory 2 hours per week. Corequisite: Lab component. Pre- or Corequisite: FDSC 4113/4111L. Prerequisites: Senior standing, FDSC 4304, FDSC 3103, and FDSC 4413.

FDSC 4754 Engineering Principles of Food Processing with Lab (Sp, even years) – Basic mechanics of refrigeration, temperature controls, materials handling and mechanical problems as applied to foods and food processing. Lecture 3 hours per week and Laboratory 3 hours per week. Prerequisite: MATH 1213, PHYS 2013, and PHYS 2011L.

CULINARY COURSES AT NORTHWEST ARKANSAS COMMUNITY COLLEGE (NWACC)

FDST 1013 Food Safety – The aim of this course is to instruct students in the proper methods and procedures regarding food safety. This course will provide students with the knowledge of safety and sanitation practices in the foodservice and hospitality industries. Through, assignments and quizzes students will apply the information of the course. Students are encouraged to take the National Serve Safe Certification exam, which is absolutely independent from course grades. Students who want to participate in the Culinary Arts program should take the ServSafe test based on the Serve Safe certification curriculum from the National Restaurant Association and is a required course for accreditation by the American Culinary federation. ***Same as FDSC 2503 at the University of Arkansas*

FDST 1023 Foundations – This course introduces basic food preparation knowledge and skills, recipe conversions and measuring techniques. Also included is instruction in the operation of commercial food service equipment and consideration of the history and value of food to society. The course consists of a lecture and lab component, both of which are competency driven.

FDST 1033 Sauces – In this course students will be instructed in the classic art of stock, sauce and soup production. Classic techniques will be taught and utilized that will then lead into a more modern approach to soups, stocks, and sauces. This course lays the foundation for many other areas of cooking and will provide invaluable competencies utilized in other courses. Prerequisites: FDST 1013, 1023

FDST 1043 Methods – The purpose of this course is to give the students specialized instruction in the center- of- the -plate items and continue to further the knowledge gained in Introduction to Food Preparation and Theory. This course builds on basic food preparation knowledge and skills by focusing on presentation and consumption of center-of-the-plate items and products. Special attention will be given to meat, fish, poultry and wild game cooking and presentation. In addition, this course further broadens knowledge of culinary arts within the commercial kitchen. Prerequisites: FDST 1033

FDST 1203 Baking – The aim of this course is to introduce students to the basic concepts and techniques of baking. This course introduces the student to the ingredients, procedures and processes of baking. The course includes concepts in formulas, measuring and scaling and the chemical reactions of basic doughs, cakes and batters, as well as practical experience in baking a wide range of foods.

FDST 1403 Butchery & Charcuterie – In the Butchery & Charcuterie course, students learn skeletal and muscular composition of animals raised for consumption and how they fabricated into primal and sub primal cuts. An overview of quality and grading along with terminology, availability and commonly used industry cuts. Students will learn to apply the correct cooking technique for every individual primal and sub primal cut. Class will include small carcass breakdown and fabrication for individual portions and for charcuterie. Students will prepare a variety of charcuterie products from fresh sausage to dry cured salamis, smoked meats. Traditional galantines, terrines and pates will be discussed and prepared. All

parts of the animal will be used in this nose to tail course, with international preparations of organ meats and cured specialties.

FDST 2003 World Cuisine – The purpose of this course is to give the student advanced training and background in ethnic foreign cuisines. This class will also explore the relationships between current food trends and ethnic influences. Provides advanced training in preparation of selected ethnic and foreign cuisines. Students will explore the relationship and influence of foreign cuisine on today's more popular ingredients and dishes.

Prerequisites: FDST 1043

BUMPERS COLLEGE COMMUNICATION

INTENSIVE COURSE LIST

This is the approved list of courses to choose from to fulfill the requirement for two communication intensive courses. This is a requirement for all Bumpers College students.

AFLS 3413H Honors Proposal Development & Research Methods (Sp, Fa) – This course will include creative process, ethics, proposal writing, literature review, qualitative and quantitative/experimental design, scientific theory and methods, data collection, and analysis. At the end of this course, students will have developed a proposal for their Honors thesis. The course also offers an opportunity for students to present their proposals orally as preparation for their proposal meeting. Pre-requisite: Sophomore, junior or senior standing.

AGED 3143 Communicating Agriculture to the Public (Sp, Su, Fa) – An overview of public communications theory and practices in the agricultural, food, and life sciences with a particular focus on technical writing, public relations and media relations writing, campaign planning, public speaking, and various mass media communication techniques, including print, broadcast, electronic, and social media.

AGED 4003 Issues in Agriculture (Fa) – Lecture and discussion on local, regional, national and international issues related to agricultural policy, ethics, environment, society, and science. Designed for students with at least six hours of upper division agricultural science courses. Prerequisite: Junior standing.

AGED 4343 Communication Campaigns in Agriculture (Sp, odd years) – Students will develop understanding of the principles, practices and applications of social marketing, integrated marketing communications, advertising and public relations as they pertain to developing communication campaign strategies for the agricultural industry. Students will develop a communication campaign for an agricultural company and/or entity focused on a specific product or service. Prerequisite: Junior, Senior or Graduate status.

CSES 3023 Crop, Soil, and Environmental Sciences Colloquium (Fa) – A communication-intensive course covering topics in agronomy and environmental, soil, and water science with particular emphasis on spoken communication but also including written communication, group activities, professionalism, ethics, problem solving, and information retrieval. A student-oriented class with collaborative participation. Colloquium workshop: 3 hours per week. Prerequisite: COMM 1313 and Junior or Senior standing only.

COMM 1313 Public Speaking (Sp, Su, Fa) – Application of the communication techniques needed to organize and deliver oral messages in a public setting. Emphasis given to theory and practice of message strategies and preparation, audience analysis, presentational skills including multimedia support, speech criticism, and the listening process.

COMM 2303 Advanced Public Speaking (Sp, Su, Fa) – Continuing study of the invention and adaptation of oral discourse to the needs of listeners. Consideration of the problems of communication in platform presentation. Prerequisite: COMM 1313.

COMM 2323 Interpersonal Communication (Sp, Su, Fa) – Personal and interpersonal factors affecting communication in everyday life. Emphasis upon ways in which interpersonal

perception, physical environment, semantic choices, and nonverbal cues affect communication primarily in the context of work, family, and other personal experiences.

COMM 2343 Introduction to Small-Group Communication (*Sp, Su, Fa*) – An introduction to procedures used in exchanging information, solving problems, determining policies, and resolving differences in committees and other small groups. Prerequisite: COMM 1313.

COMM 3383 Persuasion (*Sp, Su, Fa*) – Introduction to theories of persuasion with emphasis on application and effect. Prerequisite: COMM 1313.

ENGL 2003 Advanced Composition (*Sp, Su, Fa*) – Review course in English composition. Prerequisite: ENGL 1013 and ENGL 1023.

ENGL 2013 Essay Writing (*Sp, Su*) – Prerequisite: ENGL 1013 and ENGL 1023.

ENGL 3053 Technical and Report Writing (*Sp, Fa*) – Intensive practice in such types of writing as processes, descriptions of mechanism, abstracts, and laboratory and research reports. The criteria for effective written exposition in the scientific areas, including agriculture and engineering. Prerequisite: ENGL 1013 and ENGL 1023 or equivalent.

Bumpers College Honors Courses

AFLS 1023H Bumpers College Honors Program Perspectives (Fa) – This course is intended to meet the requirements of UNIV 1001 and provide Bumpers College Honors students with an overview of the Honors Program as well as provide insight into research and creative project development and expectations. Pre- or Corequisite: Honors standing.

AFLS 3313H Honors Global Issues in AFLS (Irregular) – The course offers students the opportunity to increase their understanding of global issues related to AFLS. The course is open to all students, but first priority will be given to AFLS Honors Students. A mandatory study tour will be scheduled during Spring Break. Pre-requisite: Instructor permission.

AFLS 3413H Honors Proposal Development & Research Methods (Sp, Fa) – This course will include creative process, ethics, proposal writing, literature review, qualitative and quantitative/experimental design, scientific theory and methods, data collection, and analysis. At the end of this course, students will have developed a proposal for their Honors thesis. The course also offers an opportunity for students to present their proposals orally as preparation for their proposal meeting. Pre-requisite: Sophomore, junior or senior standing.

AFLS 400VH Honors Thesis (Sp, Su, Fa) – May be repeated for up to 6 hours of degree credit.

AFLS 401VH Honors Special Topics (Irregular) – Studies of selected topics not covered in other courses. Must be in the Honors program to register for this course.

AFLS 403VH Honors Special Problems (Irregular) – Individual study or research for advanced undergraduates. Corequisite: Instructor consent and honors standing. May be repeated for up to 6 hours of degree credit.

AGEC 1103H Honors Principles of Agricultural Microeconomics (Sp, Fa) – Introduction to agricultural economics, including a survey of the role and characteristics of agriculture businesses in our economic system. Basic economic concepts concerning price determination, profit maximization, and resource use are emphasized. The use of economic principles as applied to the production and marketing decisions made by managers of agricultural firms is demonstrated. Credit will be allowed for only one of AGECE 1103 or ECON 2023 or ECON 2023H. Pre- or Corequisite: MATH 1203.

AGEC 3413H Honors Principles of Environmental Economics (SP) – An introductory, issues-oriented course in the economics of the environment. The course will focus on what is involved in how society makes decisions about environmental quality. The environmental issues important to the State of Arkansas and the United States will be emphasized. Pre-requisites: ACEC 1103 or ECON 2023.

AGED 3153H Honors Leadership Development in Agriculture (SP) – Identification of styles and roles of leadership; development of leadership techniques and skills required in working with organizations; dynamics of group action; methods of resolving conflict; ethical considerations for leaders; and personal skills development. Pre-requisites: junior standing.

AGED 3173H Honors Research Methods in the Social Sciences (Su) – This course offers undergraduate students the basics and explanation for appropriate research procedures,

data collection, analysis, and reporting. Course objectives to include identifying appropriate components of research works, evaluation of research in social science and creation of research projects. The purpose of the course is to prepare undergraduate students to be better producers and consumers of research in the social sciences.

ANSC 1032H Honors Introductory Animal Sciences (Sp, Fa) – Students will be introduced to biological sciences associated with modern systems of care and management of livestock. Foundation sciences include topics in genetics, growth and development, physiology, nutrition, animal health, and animal behavior.

ANSC 3032H Honors Animal Physiology I (Fa) – Fundamental aspects of neural/muscle/bone tissues and the cardiovascular system. The normal structure and functions of these systems will be emphasized. Lecture 2 hours per week. Prerequisite: BIOL 1543 and (CHEM 1123 or CHEM 1073).

ANSC 410VH Honors Special Topics in Animal Sciences (Irregular) – Topics not covered in other courses or a more intensive study of specific topics in animal sciences. Pre-requisite: Honors standing.

AMPD 1013H Honors Introduction to Clothing Concepts (Sp, Fa) – Origin of dress, the evolution of fashion as an economic power, the sociological and psychological aspects of clothing in various cultures, aesthetics of dress, selection and consumption of clothing. Lecture 3 hours per week. Prerequisite: Honors standing and HESC 1501 if HESC or AMPD major.

AMPD 4063H Honors Advanced Apparel Production (Sp, Fa) – An advanced study of product development incorporating technology used in the industry for a career in fashion merchandising and/or product development in a computer laboratory environment. Laboratory 6 hours per week. Prerequisite: AMPD 2033, AMPD 2063 and AMPD 3003 and honors candidacy.

ENSC 1001M Honors Environmental Science Laboratory (Sp, Fa) – Laboratory, field trip, and discussion sessions covering the concepts and information allowing students to critically evaluate environmental issues. Topics will include: laboratory safety, recycling, composting, geographic information systems, soil testing, water quality, hazardous wastes, waste disposal, wetlands, wastewater treatment, and sustainable food systems. Laboratory 2 hours/week. Corequisite: ENSC 1003.

ENSC 1003H Honors Environmental Science (Sp, Fa) – Series of lectures and discussions introducing the topic of environmental science including factors related to water, soil, and air quality. If taking course for University core Natural Science credit, ENSC 1001L is a co-requisite. Corequisite: ENSC 1001L.

ENSC 3103H Honors Plants and Environmental Restoration (Fa) - Selection, establishment, and use of plants to promote soil stabilization, water quality, and wildlife habitat. Principles and practices of managing plants for soil remediation, nutrient and sediment trapping, and restoration of plant communities. Pre-requisite: CSES 1203 or HORT 2003 or BIOL 1613 and honors standing.

FDSC 2401H Uncorked: Vines to Wines (Fa) – This introductory course is designed to provide students with an understanding of the basic concepts of growing grapes and winemaking, including history, grape growing, cultivars, chemistry, wine microorganisms,

fermentation, winery operations, wine marketing, and the sensory and appreciation of wine. Coursework is expected to integrate lecture and guest presenters with supplement reading assignments.

HDFS 1403H Honors Life Span Development (Sp, Fa) – A broad overview of the physical, psychological, and social development of the individual from conception until death. Emphasis is on individual development in a family context. Pre-requisite: Honors candidacy.

HDFS 2413H Honors Family Relations (Sp, Fa) – Courtship, marriage, and parenthood in the United States, with attention to cultural and psychological factors which affect relations among family members.

HDFS 2603H Rural Families and Communities (Sp) – Meaning of sociology and sociological concepts with reference to rural society; interdependence of rural and urban population in ecological areas; institutions; social change and adjustment. Prerequisite: Honors standing.

HDFS Honors Families in Crisis (Fa) – An interdisciplinary perspective on internal and external crises faced by contemporary families, including substance abuse, natural disasters and other crisis events. Students will explore the family processes during such experiences and develop strategies for stress management, coping, and recovery. Pre-requisite: Honors standing.

HESC 4233H Childhood Obesity: Context and Preventions (Su) – A multidisciplinary course that focuses on the context and prevention of childhood obesity. Directed readings and discussion will center on an ecological approach: identifying the problem(s) and behavioral and environmental factors and their interactions, as well as predisposing, enabling, and reinforcing factors, and action plan(s). The issue is addressed from a multidisciplinary perspective, including economics, marketing, child development, nutrition, and health behavior.

NUTR 1213H Honors Fundamentals of Nutrition (Sp, Fa) – The functions of food, body processes, optimum diets in relation to health and physical fitness.

POSC 3513H Current Approaches in Agricultural Laboratory Research (Even years, Sp) – A laboratory course to introduce students to current laboratory research techniques used in agricultural and life sciences. Hands-on laboratory exercises will emphasize current cellular and molecular research techniques, laboratory notebook keeping, data interpretation, and presentation of results. Prerequisite: BIOL 1543.

Discipline Related Electives

AFLS 3993 Professional Growth and Critical Career Skills (Fa) – The MERIT Profile will be utilized to identify students behavioral and character profiles so they may "know themselves" based upon strengths and tendencies. Throughout the term, students will be engaged in topics to help them identify their core values and strengths and develop their weaknesses. Course topics will include; adjusting to mistakes, cast off the negatives, verifying your values, scheduling priorities, building character, framing decisions/choices, personal improvement plans, and more. Upon course completion students should be able to utilize personal leadership approaches, strategic thinking and behavior, critical thinking and problem identification techniques and verbal and written communication to effectively convey their suitability specific feasible careers. Prerequisite: Junior standing.

AFLS 401V Special Topics in AFLS (Irregular) – Studies of selected topics not covered in other courses. May be repeated for up to 6 hours of degree credit.

AGEC 2303 Introduction to Agribusiness (Sp, Su, Fa) – Introduction to agribusiness issues as they relate to the food processing, wholesale and retail sectors of the agricultural industry. Coverage of methods and tools agribusiness managers use to evaluate business opportunities. Case studies serve to communicate concepts of product distribution, design, promotion and pricing in the development of a marketing plan. Prerequisite: AGECE 1103 or ECON 2023.

AGEC 3303 Food and Agricultural Marketing (Sp, Su, Fa) – Surveys consumer trends in food markets and the marketing activities of the food and fiber system. Emphasizes marketing concepts for both commodities and differentiated food products. Topics include applied consumer and price theory; marketing management; structure and performance of the food system; and current agricultural marketing topics. Prerequisite: AGECE 1103 or ECON 2023 or ECON 2143.

AGEC 3413 Principles of Environmental Economics (Sp) – An introductory, issues-oriented course in the economics of the environment. The course will focus on what is involved in how society makes decisions about environmental quality. The environmental issues important to the State of Arkansas and the United States will be emphasized. Prerequisite: AGECE 1103 or ECON 2023.

AGEC 3503 Agricultural Law I (Fa) – Examination of those areas of law especially applicable to agriculture. Fundamentals of contract law, torts law, and property law will accompany discussion of major areas of agricultural law; acquisition and disposal of farmland; farm tenancies; rights and limitations in the use and ownership of farmland; water law; environmental protection; protection of the productivity of agricultural land; and the law of sales and secured transactions in an agricultural context.

AGEC 3523 Environmental and Natural Resources Law (Even years, Sp) - Principles of environmental and natural resources law relevant to agriculture, food and the environmental sciences; legal principles relating to regulation of water, air, hazardous substances, land, wildlife, livestock, and water rights. Principles of civil and criminal liabilities and other developing legal and regulatory issues relating to agriculture and natural resources.

AGEC 4303 Advanced Agricultural Marketing Management (Sp) – Marketing concepts will be developed and applied to the global food and fiber system. The course will use both commodity and product marketing principles and economic theory to analyze varied marketing situations. Case studies will be used to demonstrate the role that demand analysis and consumer behavior play in market management. Prerequisite: AGEC 2303 and AGEC 3303.

AGEC 4313 Agricultural Business Management (Fa) – The planning, organizing, leading and controlling functions of management as they relate to agricultural business firms. Marketing of value-added products, budgeting, organizational structure, cost control, financial statements, capital budgeting and employee supervision and motivation. Case studies are used to teach communication and decision-making skills. Prerequisite: (AGEC 2142/AGEC 2141L or AGEC 2142) or equivalent, AGEC 2303 or equivalent, and senior standing is recommended.

AGEC 4323 AgriBusiness Entrepreneurship (Sp) – Agribusiness entrepreneurship is the process of bringing food or rural-based products and services from conceptualization to market. The course presents the opportunities, problems and constraints facing individuals and firms operating in rural or isolated markets while emphasizing the steps in conceptualization, development, marketing, and delivery-selling of agribusiness rural products. Prerequisite: AGEC 1103 or equivalent.

AGEC 4603 Food Economics and Health (SP) - This course provides an advanced overview of selected topics in food economics, food and nutrition policy and the interface between nutrition programs and health policy. Students will develop an understanding of economic and policy concepts of food, nutrition, and health. The course emphasizes analytical tools that can be applied to study issues in food, nutrition, and health facing the US and world populations. Prerequisite: [AGEC 1103](#) (or ECON 2023) and AGEC 2403 or equivalent.

AGEC 4613 Domestic and International Agricultural Policy (Fa) – Agricultural and food policies studied from domestic and international perspectives. Examines public policy in terms of rationale, content, and consequences. Economic framework used to assess policies to improve competitive structure, operation, and performance of U.S. and international food and agriculture. Farm, international trade, resource, technology, food marketing, and consumer policies analyzed. Prerequisite: (AGEC 1103 or ECON 2023) and (AGEC 2103 or ECON 2013) and (PSYC 2003 or SOCI 2013 or RSOC 2603).

AGED 3153 Leadership Development in Agriculture (Sp) – Identification of styles and roles of leadership; development of leadership techniques and skills required in working with organizations; dynamics of group action; methods of resolving conflict; ethical considerations for leaders; and personal skills development.

AGED 4003 Issues in Agriculture (Fa) – Lecture and discussion on local, regional, national and international issues related to agricultural policy, ethics, environment, society, and science. Designed for students with at least six hours of upper division agricultural science courses. Prerequisite: Junior standing.

AGED 4153 Survey of Leadership Theory in Agriculture (Fa) – An interdisciplinary analysis of current issues in the practice of leadership in a contemporary and changing

society, particularly as they affect agricultural organizations and issues. Discussions of leadership theory, roles of leaders, skills for effective leadership, diversity issues, and followership will challenge students to think critically about leadership, enhance personal leadership performance and potential, and prepare for or expand leadership roles, and to become innovative and productive in dealing with challenges facing agricultural organizations today. Prerequisite: AGED 3153.

ANSC 3613 Meat Science (Fa) – The study of meat science and muscle biology. Topics will include animal/tissue growth and development and the relationship to meat quality. Meat processing, preservation, and meat safety concerns will also be considered. Lecture 3 hours per week. Prerequisite: CHEM 2613 or CHEM 3603.

CHEM 4211L Instrumental Analysis Laboratory (Sp) – Provides laboratory experience in parallel with the lecture material in CHEM 4213. Laboratory 3 hours per week. Pre- or Corequisite: CHEM 4213.

CHEM 4213 Instrumental Analysis (Sp) – Provides students, especially those in the agricultural, biological, and physical sciences, with an understanding of modern instrumental techniques of analysis. Lecture 3 hours per week. Prerequisite: (CHEM 2263 and CHEM 2261L and CHEM 3613 and CHEM 3611L) or (CHEM 3713 and CHEM 3712L).

HESC 4233 Childhood Obesity: Context and Preventions (Su) – A multidisciplinary course that focuses on the context and prevention of childhood obesity. Directed readings and discussion will center on an ecological approach: identifying the problem(s) and behavioral and environmental factors and their interactions, as well as predisposing, enabling, and reinforcing factors, and action plan(s). The issue is addressed from a multidisciplinary perspective, including economics, marketing, child development, nutrition, and health behavior.

MGMT 3563 Management Concepts and Organizational Behavior (Irregular) – Business students may not receive credit for this course. Course introduces students to fundamental concepts of management practice with particular emphasis on managing human behavior in organizations. Addresses the planning, organizing, directing, and controlling functions performed by managers as these functions relate to managing human resources. Provides survey of critical management concepts; enables students to develop analytical and problem solving skills through case studies and experimental exercises. Students may not receive credit for both WCOB 2033 or MGMT 2103 and MGMT 3563. Non degree credit for business majors.

MGMT 3933 Entrepreneurship and New Venture Development (Fa, Sp) – The role of the entrepreneur in starting up new businesses. Identification of new venture opportunities and the evaluation of their feasibility.

MGMT 4243 Ethics and Corporate Responsibility (Sp, Fa) – A comprehensive and critical examination of traditional and current ethical theories and approaches that guide business decision-making, ethical issues that affect business decisions, and ethics related to the various business disciplines.

MGMT 4583 International Management (Fa, Sp) – Develops an understanding of international business management and the cultural environments in which IB exists today. Students examine international business practices and learn about unique elements of business as it practiced in selected nations and diverse cultures.

MKTG 3433 Introduction to Marketing (Sp, Su, Fa) – Examines strategies, tactical, and operational decisions related to contemporary marketing activities. Topics covered include product, services and international strategies in consumer and business markets. Prerequisite: (ECON 2013 and ECON 2023) or (ECON 2143) and WCOB 1033 with a grade of C or better.

MKTG 3553 Consumer Behavior (Fa, Sp) – Analyzes consumer motivation, buying behavior, market adjustment, product innovation and adaptation; consumer market measurement, including survey of economic, behavioral science theories of consumer market behavior, producer and intermediary reactions. Consumer decision making is evaluated as to psychological drives, sociological concepts used by producers, channel intermediaries, consumers; considers methods, techniques for measuring consumer behavior, and analyzing consumer markets. Prerequisite: MKTG 3433.

MKTG 3633 Marketing Research (Fa, Sp) – Research designs, techniques, and analyses of primary and secondary data for the purposes of (1) developing market forecasts and segmentation analyses; (2) strategy implementation determining product development, pricing, distribution, and promotion decisions; and (3) monitoring customer attitudes, motivations and satisfaction. Prerequisite: MKTG 3433.

MKTG 4633 Global Marketing (Sp, Fa) – Examines differences in global environment; how cultural considerations, political, legal, and economic conditions affect market entry strategies and marketing mix decisions; development of marketing plan for global environments. Prerequisite: MKTG 3433.

MKTG 4853 Marketing Management (Fa, Sp) – Strategic planning and management of the marketing function within the firm from a managerial viewpoint. Focus on the development and management of marketing strategies and tactics related to product, pricing, promotion, and distribution decisions. Prerequisite: MKTG 3633 and MKTG 3553.

NUTR 1213 Fundamentals of Nutrition (Sp, Fa) – The functions of food, body processes, optimum diets in relation to health and physical fitness.

NUTR 2203 Sports Nutrition (Sp) – The integration of concepts from nutrition and exercise physiology into an applied multidisciplinary study of how food, beverages and dietary supplements influence physical performance. Prerequisite: NUTR 1213.

NUTR 3203 Human Nutrition (Sp) – Fundamental human nutrition; nutritive value of foods and general functions of nutrients based on concepts derived from inorganic and organic chemistry. Examples relating nutrition to disease used as illustrations to deepen understanding of normal nutrition. Lecture 3 hours per week. Pre- or Corequisite: CHEM 2613 and CHEM 2611L or CHEM 3603 and CHEM 3601L. Prerequisite: NUTR 1213.

NUTR 4213 Advanced Nutrition (Fa) – Normal nutrition with emphasis on utilization of nutrients. Lecture and reports on current literature 3 hours per week. Prerequisite: CHEM 3813 and NUTR 3203.

NUTR 4223 Life Cycle Nutrition (Fa) – Study of normal nutrition emphasizing quantitative needs for nutrients as functions of biologic processes that vary during stages of the life cycle. Attention is given to preconception, pregnancy, childhood and older adults. Prerequisite: NUTR 1213 and either (BIOL 2213 and BIOL 2211L or ANSC 3032 and ANSC 3042) or (CHEM 1073 and CHEM 1071L or CHEM 1103 and BIOL 1543 and BIOL 1541L).

NUTR 4243 Community Nutrition (Sp) – Identifying, assessing, and developing solutions for nutritional problems encountered at the local, state, federal, and international levels. Lecture 3 hours per week. Prerequisite: NUTR 1213.

POSC 4233 Value Added Muscle Foods (Even years, Sp) – An intense study of muscle structure and how it relates to the development of further processed meat products. Muscle ultrastructure, protein functionality, product development, and quality analysis will be covered. In class hands on activities will also be included to allow students to obtain experience of producing processed meat products. Prerequisite: POSC 4314.

POSC 4314 Egg and Meat Technology (Fa) – Study of the science and practice of processing poultry meat and egg products; examination of the physical, chemical, functional and microbiological characteristics of value added poultry products; factors affecting consumer acceptance and marketing of poultry products and the efficiency of production. Corequisite: Lab component. Prerequisite: (CHEM 1123 and CHEM 1121L) or (CHEM 1073 and CHEM 1071L) and BIOL 1543 and BIOL 1541L.

SUST 1103 Foundations of Sustainability (Sp) – Foundations of Sustainability is an interdisciplinary course to introduce concepts and theories of sustainability at global, regional, and local levels. Emphasis is on four thematic areas of sustainability; social, natural, built and managed systems. The aim is to increase environmental literacy for engagement of sustainability into students' own disciplines.

SUST 2103 Applications of Sustainability (Fa) – Applications of Sustainability is an interdisciplinary course introducing data gathering, data analysis or interpretation, and synthesis of data applied to problems in sustainability. Students engage in hands-on, inquiry-based investigation of sustainability issues across four thematic areas: social systems, natural systems, built systems (Architecture & Engineering), and managed systems (Agriculture & Business). Prerequisite: SUST 1103 or instructor consent.

Steps to an Internship in Food Science

You are ready to pursue completion of your internship requirement...now what?

Step One – Be responsible

Students should realize that it is ultimately their responsibility to secure their own internship. Do not depend solely on your advisor or the 'Internship Committee' to provide an internship opportunity. Show your self-motivation, initiative and proactivity in seeking an internship, as these are key employee characteristics companies are seeking.

Ensure that you observe the following key fall deadlines below, if you are seeking an internship in the following summer:

- First week of September – Attend the mandatory informational meeting
- September 15th – Submit your resume to your advisor for distribution to interested companies.
- February 1 – Have followed up with your Advisor on your internship status.

Although you should not delegate your task of finding an intern position, realize that your Advisor and Intern Committee are a resource to be consulted to support your efforts. Make the best use of these resources and fulfill your responsibilities by following the instructions below.

Step Two – Apply for an internship

Internships are typically available in summer, however they are occasionally available during fall or spring semesters. Students typically complete their internship between the sophomore and junior year or the junior and senior year.

To qualify for degree requirements, an internship will be any practical work experience in the food industry or government food regulatory agency in the US or overseas.

There are several resources for finding available internships.

- 1) Watch your uark email - companies seeking interns often send announcements for these opportunities to the department and they are forwarded to you through email.
- 2) Use the internet. Visit human resource pages for food companies to watch for postings on their websites for internships. Google or use employment search engines to look for food science internships.
- 3) Another source is the Career Development Center (CDC) here at the UA. Attend their career fairs to meet prospective internship employers and also utilize Razorback CareerLink (see the CDC website for more information:
<http://career.uark.edu/new/students/>)
- 4) The Food Science Internship Committee will compile a booklet of student resumes for distribution to contacts the department has in the food industry. To have your resume included in this booklet:
 - ✓ **First week in September – Attend the mandatory informational meeting.**
 - ✓ **September 15 deadline – To submit your resume, Student Internship Interest Form and photo electronically to Cathy Hamilton (hamilton@uark.edu).** The Student Internship Interest Form is available on the Food Science web site at this

address: <http://food-science.uark.edu/undergraduate-students/internships.php>. If you need assistance in preparing or fine tuning your resume visit the Career Development Center (Arkansas Union #607).

✓ **Follow up with Cathy on your internship status by February 1.**

PLEASE NOTE: While this resource is available to assist you in locating an internship, ULTIMATELY IT IS YOUR RESPONSIBILITY TO SECURE YOUR INTERNSHIP. So, do not depend solely on the Internship Committee to locate your internship.

Step Three – Placement in an internship

As you apply for internships, be sure to watch your email closely for responses from potential employers. You will most likely be contacted by email to set up an interview and the potential employer will expect an expeditious reply. Most potential employers will contact you directly to set up an interview. However, some potential employers will set up their interviews through the Internship Committee. It is imperative that you check your email frequently during this time to avoid missing any opportunities.

Once you have accepted internship employment, notify Cathy Hamilton (hamilton@uark.edu).

Step Four – Registration for course credit

All Food Science students are required to complete three hours of course credit for FDSC 431V Internship in Food Science. The duration of your internship should be at least 150 contact hours to earn three hours of course credit. Internships of shorter duration are still eligible for course credit, the number of credit hours will be determined based on duration of the internship. Registration for course credit is available in any semester.

Registration in FDSC 431V requires instructor consent, meaning you will need departmental assistance to register. To register for course credit, notify Cathy Hamilton of the starting date and ending date for your internship and the appropriate semester for enrollment will be determined. Cathy will then administratively register you in the course.

Step Five – Your internship

At the beginning of your internship, provide Cathy Hamilton (hamilton@uark.edu) with the name and email address of your supervisor during your internship. During your internship you should maintain contact with the Internship Committee (Dr. Proctor, aproctor@uark.edu; Dr. Meullenet, jfmeull@uark.edu; Dr. Howard, lukeh@uark.edu; Cathy Hamilton, hamilton@uark.edu; Dr. Atungulu, atungulu@uark.edu; Dr. Morawicki, rmorawic@uark.edu). You should check in regularly with updates on how your internship is going. If you have any questions or concerns regarding any aspect of your internship, do not hesitate contacting one or more of the committee members above. If you are experiencing any conflicts or issues with your internship, the Internship Committee should be contacted immediately!

Remember, an internship is both a learning experience and an employment experience.

Step Six – Completion of internship requirements

All students participating in the internship program have the following requirements to earn course credit – a written report, feedback forms and a presentation for the Internship Committee.

These requirements should be fulfilled during the term associated with the completion of your internship employment.

- 1) The Written Report – a report to be submitted electronically to Cathy Hamilton (hamilton@uark.edu) who will forward the report to the remaining members of the Internship Committee. The report must be submitted at least 48 hours prior to your meeting with the Committee. Each internship is unique, therefore the content of the written report will vary based on what your internship entailed.

Your report should contain:

- a) brief background information on the company – it is important that you have a good understanding of the company you are working for, so we want you to include that information in the report. However, the information below on what you did and what you learned should be the main focus of your internship report.
- b) a discussion of what you did during your internship. If you were given a specific problem to work on, discuss the problem and what you did to resolve the problem. If you shadowed someone, discuss what that person’s job is and how it fits into the overall operation. Whatever your job duties were during the internship – talk about it!
- c) a discussion of how you were able to apply what you have learned in the classroom in a “real-life” experience and how this internship will benefit you in your future plans.

PLEASE NOTE: It is very important that you discuss the contents of your report with your internship employer to ensure that company confidentiality policies are adhered to. If during your internship you were privy to confidential information, please do not include that information in your report!

- 2) The Student Feedback Form – this form is available on the Food Science web site (<http://food-science.uark.edu/undergraduate-students/internships.php>). This form must be filled out by the student and submitted electronically to Cathy Hamilton, (hamilton@uark.edu) who will forward the feedback form to the remaining members of the Internship Committee. The student feedback form must be submitted at least 48 hours prior to your meeting with the Committee.
- 3) The Company Feedback Form – this form is available on the Food Science web site (<http://food-science.uark.edu/undergraduate-students/internships.php>). This form must be filled out by the internship employer and submitted to Cathy Hamilton electronically (hamilton@uark.edu) who will then forward to the remaining members of the Internship Committee. The company feedback form must be submitted prior to your meeting with the Committee. **It is your responsibility to ensure that your internship employer submits this evaluation form.**
- 4) Meeting with the Internship Committee – you will prepare a 10 minute PowerPoint presentation to present to members of the Internship Committee regarding your internship experience. Your presentation should be saved on a USB drive and brought with you to your meeting with the Committee. Proper dress for your meeting with the Committee is business casual. The day/time of your presentation will be determined at the beginning of

the semester in which you register for credit. The focus of your presentation will be on what you did during your internship.

REMINDER: Your internship report and feedback forms MUST be submitted at least 48 hours prior to your meeting with the Committee.

Step Seven – Informal presentation

You may be invited to make an informal presentation to Food Science students with the purpose of promoting the internship program. The feasibility of scheduling a presentation will be determined individually each semester.