

Food Science & Technology

Undergraduate Student Handbook 2016 - 2017



NUTRITION & FOOD SCIENCE

TEXAS A&M UNIVERSITY

TAMU 2253 • 126 Cater Mattil
College Station, TX 77843 • 979-845-2142 • <http://nfs.tamu.edu>

This handbook provides information about course requirements, scheduling, and recommendations for two degree options in food science. For up-to-date information on additional courses, admission, B.S. degree requirements, scholastic deficiency, financial aid and other topics not addressed in full detail in this handbook, refer to the Texas A&M University Undergraduate Catalog and Texas A&M University Rules and Regulations. Students are expected to comply with all policies and procedures set forth by Texas A&M University, and all affiliating institutions. Access to the Texas A&M University Undergraduate Catalog may be obtained at:

<http://catalog.tamu.edu>

***This link will lead you to the main Texas A&M University Catalog page.
Your catalog is the 2016-2017 Undergraduate Catalog.***

FOOD SCIENCE & TECHNOLOGY

Welcome to Food Science and Technology! You are entering an exciting field that allows you to build a strong background for many career opportunities such as food safety and microbiology, quality assurance, processing and operating management, technical service, research and development, sales and public relations. Advisors to assist you in Food Science:

For advising in Food Science and Technology, contact:

Dr. Poppy Capehart '75
Coordinator, Academic Programs
Senior Academic Advisor II
126 Cater Mattil
Phone: 979-845-2142
E-mail: poppy@tamu.edu

Fax Number: 979-862-6842

SUBSCRIPTION TO FOOD SCIENCE LISTSERV

This email distribution list is used by advisors to communicate job opportunities, scholarships, internships, and other relevant information.

You can join the list by sending an e-mail to listserv@listserv.tamu.edu and in the BODY put SUBSCRIBE food-science firstname lastname

Example: SUBSCRIBE food-science Rock T Aggie

You can remove your name from the list by sending an e-mail to listserv@listserv.tamu.edu and in the BODY put UNSUB food-science

ADVISING INFORMATION

Catalog Requirements

You are responsible for following the degree plan from the catalog in effect when you entered Texas A&M. For example, if you begin in the Department of Nutrition and Food Science as a freshman or transfer student in Fall of 2016 you will follow the Fall 2016 catalog for the duration of your time at Texas A&M. In order to prevent taking courses which do not meet current requirements, students should check with their advisors before selecting electives, including courses to meet requirements of the Core Curriculum.

Registration

Advising help sessions are scheduled by appointment the month before pre-registration begins. This is a good opportunity to visit with an advisor to discuss your schedule. If you are a continuing student in good standing, you are expected to pre-register. **If you are on scholastic probation you will be blocked from registration until you meet with an advisor.** Please call 845-2142 for more information. Registration is completed by going to howdy.tamu.edu and following the instructions.

Add/Drop, Withdrawal

The schedule for adding and dropping is listed online at howdy.tamu.edu. The policy for add/drop and withdrawal is in the current Undergraduate Catalog. The withdrawal process is done in the Dean's Office of the College of Agriculture and Life Sciences in AGLS 515.

Scholastic Deficiency

You are responsible for knowing and abiding by probation and block procedures and requirements:

- ❖ Should your GPR drop below 2.000 you will be notified of:
 - placement on scholastic probation, and placement of block from registration – must meet with major advisor to have block removed.
- ❖ A probation agreement will be signed with an advisor that describes the terms of your probation.
- ❖ Failure to meet this agreement will result in being blocked from registration and notification of procedures for withdrawal from Texas A&M University.

Texas A&M University, Department of Nutrition and Food Science
Scholastic Probation Agreement

Student Name: _____ UIN: _____

Major _____ Concentration: _____

Email Address: _____ Phone: _____

Students placed on scholastic probation (GPR below 2.0) in the Department of Nutrition and Food Science must agree to the following conditions and expectations outlined in this document.

I understand that while on scholastic probation, I:

- Have been granted two semesters to clear probation, and I must meet the conditions of my first probation agreement to be allowed to continue to the second semester.

Current GPR: _____ Current Grade Point Deficiency: _____
Must make up _____ points during the _____ semester.

- Must be a full time student and take courses recommended by my advisor.
- Must complete Success Program through the Academic Success Center by the end of the semester of probation. Certification will need to be presented to an academic advisor.
Date of *mandatory* Success Program meeting:
_____.
- Must commit to attend every class as scheduled. If I am absent for school activities and/or personal issues, I am to meet with my course instructors to make up any missed work.
- Will change the habits that prevented me from being unsuccessful last semester (ie. work hours, social activities, attendance, study skills, etc.).
- Will contact a NFSC Advisor immediately if extenuating circumstances arise which may affect my final grades, course registration, or enrollment status.
- Understand that while on probation, my future course registrations will be blocked until I meet with a NFSC Advisor to review my progress and update the Scholastic Probation Agreement.

I understand that failure to meet the terms of this agreement will result in dismissal. The Department of Nutrition and Food Science does not readmit students once dismissed or those who transfer to another program while on probation. I agree to these terms of probation.

Student Signature

Date

Advisor Signature

Date

Department Head or Academic Designate

Date

REQUIREMENTS FOR A B.S. DEGREE IN FOOD SCIENCE & TECHNOLOGY

A minimum of 120 semester hours must be completed. All courses on your individual degree plan must be completed. A minimum of 36 semester hours of 300 and/or 400 level coursework must be successfully completed in residence at Texas A&M University to obtain a baccalaureate degree. A minimum of 12 of those 36 hours must be in the major. See the current Undergraduate Catalog for more information.

Food Science and Technology is an exciting multidisciplinary field that prepares majors with a comprehensive knowledge of the biological, physical and engineering sciences to develop new food products, design innovative processing technologies, improve food quality and nutritive value, enhance the safety of foods and ensure the wholesomeness of our food supply. Food Science majors apply the principles learned in the basic sciences such as food chemistry, biochemistry, genetics, microbiology, food engineering and nutrition to provide consumers with safe, wholesome and attractive food products that contribute to their health and well-being.

The undergraduate curriculum is approved by the Institute of Food Technologists (IFT) and offers two tracks, a Food Science Option and an Industry Option. These tracks provide promising career opportunities in areas such as food product/ process design, technical service, research and development, quality assurance, food safety, food law, regulatory oversight, technological innovation, marketing, corporate sales, sensory evaluation, and operations management. There are numerous opportunities available for corporate internships, scholarships and study abroad programs that provide real-world experience and enhance opportunities for employment after completing a baccalaureate degree. The major also provides an excellent background for those interested in professional schools, graduate studies, medicine, veterinary medicine, dentistry, pharmacy, physical therapy, nursing, occupational therapy and public health.

Food Science Option

The Food Science option provides a strong knowledge base and fundamental understanding of chemistry, biology, engineering, physics, statistics, genetics, biochemistry, microbiology, and nutrition that is applied toward the preservation, processing, packaging and distribution on foods that are wholesome, affordable and safe. The goal of the curriculum is to prepare Food Scientists for career opportunities in the food and allied industries or for further studies in graduate or professional schools. See an academic advisor for specific course listings.

Food Industry Option

The Food Industry option integrates knowledge from the basic disciplines of chemistry, microbiology, physics and biology and applies scientific principles from food engineering, food processing operations, sensory evaluation, food safety, HACCP, quality assurance and management to produce foods that are wholesome, affordable and safe. The goal of the curriculum is the prepare Food Technologists for careers in the food and related industries. These careers may involve food processing, manufacturing, technical service, food product development, operations management, regulatory oversight and other technology based opportunities.

Curriculum in Food Science and Technology
Option: Science
Catalog No. 139 (2016-2017)¹

FRESHMAN YEAR

<u>First Semester</u>		<u>Second Semester</u>	
ENGL 103 or 104	3	American History Elective ²	3
MATH Elective	3	MATH Elective	3
CHEM 101/111	4	CHEM 102/112	4
FSTC 201	3	BIOL 111	4
FSTC 210	<u>2</u>	Free Elective ⁷	<u>1</u>
	15		15

SOPHOMORE YEAR

<u>First Semester</u>		<u>Second Semester</u>	
NUTR 202	3	CHEM 228/238	4
CHEM 227/237	4	American History Elective ²	3
Economics Elective ⁶	3	ACCT 209 ³	3
POLS 206	3	Creative Arts Elective ²	3
Lang., Phil. & Culture Elective ²	<u>3</u>	PHYS 201	<u>4</u>
	16		17

JUNIOR YEAR

<u>First Semester</u>		<u>Second Semester</u>	
FSTC 311	3	FSTC 312/313	4
ENGL 210	3	FSTC Elective ⁴	3
POLS 207	3	STAT 302	3
CHEM 316/318	3	MGMT 309	3
Free Elective ⁷	<u>3</u>	Free Elective ⁷	<u>1</u>
	15		14

SENIOR YEAR

<u>First Semester</u>		<u>Second Semester</u>	
FSTC 326/327 or DASC 326/327	4	FSTC 315 or AGSM 315	3
FSTC 314	3	FSTC 401	3
FSTC 444	3	BICH 303 or 410	3
FSTC 481 Seminar	1	Free Elective ⁷	2
Free Elective ⁷	<u>3</u>	FSTC Elective ⁴	<u>3</u>
	14		14

A total of 120 hours is required for graduation; 36 hours of 300/400 level courses are required to meet the TAMU residency requirement.

1. Catalog should correspond with your first semester.
2. University Core Curriculum. Six hours of international and cultural diversity are required. Selection must be from courses on the approved list. Selection can be courses that also satisfy the requirement for social and behavioral sciences, visual and performing arts, humanities, or electives.
3. Students may take ACCT 229 Principles of Accounting.
4. Students may choose from ANSC 307, ANSC 457, FSTC 305, FSTC 307, FSTC 315, FSTC 406, FSTC 410, FSTC 440, FSTC 446, FSTC 457, FSTC 469, FSTC 471, FSTC 485, FSTC 489, FSTC 491, HORT 419, HORT 420, HORT 421, HORT 446, NUTR 211, POSC 406.
5. KINE 199 must be taken Pass/Fail.
6. Students may choose from AGECE 105, ECON 202 or ECON 203.
7. Students may earn a chemistry minor by taking 6 hours of additional chemistry courses from an approved list as free electives. See the Department of Chemistry for more details. Students seeking a minor in chemistry must complete the Declaration of Minor in Chemistry form and have it approved by the undergraduate advisor in Chemistry (Room 104 Chemistry) and their NFSC advisor.

**CURRICULUM IN FOOD SCIENCE AND TECHNOLOGY
FOOD SCIENCE OPTION
CATALOG NO. 139 (2016-2017)***

University Core Curriculum**

Citizenship

- _____ History Elective (3) (**TCCN: HIST 1301**)
- _____ History Elective (3) (**TCCN: HIST 1302**)
- _____ POLS 206 (3) (**TCCN: GOVT 2305/2302**)
- _____ POLS 207 (3) (**TCCN: GOVT 2306/2301**)

Communication

- _____ ENGL 103 or 104 (3) (**TCCN: 1301**)
- _____ ENGL 210 (3) (**TCCN: 2311**)

Natural Sciences

- _____ CHEM 101/111 (4) (**TCCN: 1411**)
- _____ CHEM 102/112 (4) (**TCCN: 1412**)

Language, Philosophy and Culture

- _____ Language, Philosophy, and Culture Elective (3)

Mathematics and Statistics

- _____ MATH 141 (3) (**TCCN: 1324**)
- _____ MATH 142 (3) (**TCCN: 1325**)
- _____ STAT 302 (3)

Social and Behavioral Sciences

- _____ AGECE 105 or ECON 202 or 203 (3)

Creative Arts

- _____ Creative Arts Elective (3)

International & Cultural Diversity

- _____ 3 hours (can be used to satisfy
- _____ 3 hours other requirements)

Writing Intensive Credits (must be FSTC)

- (1) FSTC 481
- (2) FSTC 313

Science Courses (Credit hours)

Physics

- _____ PHYS 201 (4) (**TCCN: PHYS 1401**)

Biochemistry

- _____ BICH 303 or 410 (3)

Biology

- _____ BIOL 111 (4) (**TCCN: 1406**)

Nutrition

- _____ NUTR 202 (3) (**TCCN: BIOL 1322**)

Chemistry

- _____ CHEM 227 (3) (**TCCN: 2423**)
- _____ CHEM 237 (1) (**TCCN: 2423**)
- _____ CHEM 228 (3) (**TCCN: 2425**)
- _____ CHEM 238 (3) (**TCCN: 2425**)
- _____ CHEM 316 (2)
- _____ CHEM 318 (1)

Required Food Science Courses

- _____ FSTC 201 (3)
- _____ FSTC 210 (2)
- _____ FSTC 311 (3)
- _____ FSTC 312/313 "W" (4)
- _____ FSTC 314 (3)
- _____ FSTC 315 (3)
- _____ FSTC 326/327 (4)
- _____ FSTC 401 (3)
- _____ FSTC 481 "C" (1)
- _____ FSTC 444 (3)
- _____ FSTC Electives (3)***
- _____ FSTC Electives (3)***

Business Requirement

- _____ ACCT 209 or 229 (3)
- _____ MGMT 309 (3)

Free Electives (10 total)****

- _____ Free Electives
- _____ Free Electives
- _____ Free Electives

A total of 120 hours is required for graduation; 36 hours of 300/400 level courses are required at TAMU.

* Catalog should correspond with your first semester.

** University Core Curriculum.

*** Students may choose from ANSC 307, ANSC 457, FSTC 305, FSTC 307, FSTC 315, FSTC 406, FSTC 410, FSTC 440, FSTC 446, FSTC 457, FSTC 469, FSTC 471, FSTC 485, FSTC 489, FSTC 491, HORT 419, HORT 420, HORT 421, HORT 446, NUTR 211, POSC 406.

**** Students may earn a chemistry minor by taking 6 hours of additional chemistry courses from an approved list as free electives. See the Department of Chemistry for more details. Students seeking a minor in chemistry must complete the Declaration of Minor in Chemistry form and have it approved by the undergraduate advisor in Chemistry (Room 104 Chemistry) and their NFSC advisor.

Curriculum in Food Science and Technology
Option: Industry
Catalog No. 139 (2016-2017)¹

FRESHMAN YEAR

<u>First Semester</u>		<u>Second Semester</u>	
ENGL 103 or 104	3	American History Elective ²	3
NUTR 202 or 203	3	MATH Elective	3
CHEM 101/111	4	CHEM 102/112	4
FSTC 201	3	Economics Elective ⁵	3
FSTC 210	<u>2</u>	Lang., Phil. & Culture Elective ²	<u>3</u>
	15		16

SOPHOMORE YEAR

<u>First Semester</u>		<u>Second Semester</u>	
BIOL 111	4	ACCT 209	3
CHEM 227/237	4	American History Elective ²	3
POLS 206	3	Creative Arts Elective ²	3
MATH Elective	<u>3</u>	PHYS 201	4
	14	Free Elective ⁶	<u>3</u>
			16

JUNIOR YEAR

<u>First Semester</u>		<u>Second Semester</u>	
FSTC 311	3	AGEC 314	3
ENGL 210	3	FSTC 312/313	4
POLS 207	3	STAT 302	3
Free Elective ⁶	3	MGMT 309	3
FSTC Elective ³	<u>3</u>	Free Elective ⁶	<u>1</u>
	15		14

SENIOR YEAR

<u>First Semester</u>		<u>Second Semester</u>	
FSTC 326/327 or DASC 326/327	4	FSTC 481 Seminar	1
FSTC 314	3	FSTC 401	3
FSTC 315 or AGSM 315	3	BICH 303 or 410	3
FSTC 444	3	FSTC Elective ³	3
Free Elective ⁶	<u>1</u>	Free Elective ⁶	<u>6</u>
	14		16

A total of 120 hours is required for graduation; 36 hours of 300/400 level courses are required to meet the TAMU residency requirement.

1. Catalog should correspond with your first semester.
2. University Core Curriculum. Six hours of international and cultural diversity are required. Selection must be from courses on the approved list. Selection can be courses that also satisfy the requirement for social and behavioral sciences, visual and performing arts, humanities, or electives.
3. Students may choose from ANSC 307, ANSC 457; FSTC 300, FSTC 305, FSTC 307, FSTC 406, FSTC 407, FSTC 410, FSTC 440, FSTC 446, FSTC 457, FSTC 469, FSTC 471, FSTC 485, FSTC 489, FSTC 491; HORT 419, HORT 420, HORT 421, HORT 446; NUTR 211; POSC 406.
4. KINE 199 must be taken Pass/Fail.
5. Students may choose from AGECE 105, ECON 202 or ECON 203.
6. Students may achieve a business minor by taking the following courses as free electives: ISYS 209, MGMT 209, FINC 409, MKTG 409.

**CURRICULUM IN FOOD SCIENCE AND TECHNOLOGY
INDUSTRY OPTION
CATALOG NO. 139 (2016-2017)***

University Core Curriculum**

Citizenship

- _____ History Elective (3) (**TCCN: HIST 1301**)
 _____ History Elective (3) (**TCCN: HIST 1302**)
 _____ POLS 206 (3) (**TCCN: GOVT 2305/2302**)
 _____ POLS 207 (3) (**TCCN: GOVT 2306/2301**)

Communication

- _____ ENGL 103 or 104 (3) (**TCCN: 1301**)
 _____ ENGL 210 (3) (**TCCN: 2311**)

Natural Sciences

- _____ CHEM 101/111 (4) (**TCCN: 1411**)
 _____ CHEM 102/112 (4) (**TCCN: 1412**)

Languages, Philosophy, and Culture

- _____ Languages, Philosophy, and Culture Elective (3)

Mathematics and Statistics

- _____ Math 141 (3) (**TCCN: 1324**)
 _____ Math142 (3) (**TCCN: 1325**)
 _____ STAT 302 (3)

Social and Behavioral Sciences

- _____ AGECE 105 or ECON 202 or 203 (3)

Creative Arts

- _____ Creative Arts Elective (3)

International & Cultural Diversity

- _____ 3 hours (can be used to satisfy other
 _____ 3 hours requirements)

Writing Intensive Credits (must be FSTC)

- (1) FSTC 481
 (2) FSTC 313

Science Courses (Credit hours)

Physics

- _____ PHYS 201 (4) (**TCCN: PHYS 1401**)

Biochemistry

- _____ BICH 303 or 410 (3)

Biology

- _____ BIOL 111 (4) (**TCCN:1406**)

Nutrition/VTPH

- _____ NUTR 202 (3) (**TCCN: BIOL 1322**)

Chemistry

- _____ CHEM 227(3) (**TCCN: 2423**)
 _____ CHEM 237 (1) (**TCCN: 2423**)

Required Food Science Courses

- _____ FSTC 201 (3)
 _____ FSTC 210 (2)
 _____ FSTC 311 (3)
 _____ FSTC 312/313 "W" (4)
 _____ FSTC 314 (3)
 _____ FSTC 315 (3)
 _____ FSTC 326/327 (4)
 _____ FSTC 401 (3)
 _____ FSTC 481 "C" (1)
 _____ FSTC 444 (3)
 _____ FSTC Electives (3)***
 _____ FSTC Electives (3)***

Business Requirement

- _____ ACCT 209 (3)
 _____ MGMT 309 (3)
 _____ AGECE 314 (3)

Free Electives (14 total)****

- _____ Free Electives
 _____ Free Electives
 _____ Free Electives
 _____ Free Electives

A total of 120 hours is required for graduation; 36 hours of 300/400 level courses are required at TAMU.

* Catalog should correspond with your first semester.

** University Core Curriculum.

*** Students may choose from ANSC 307, ANSC 457, FSTC 305, FSTC 307, FSTC 315, FSTC 406, FSTC 410, FSTC 440, FSTC 446, FSTC 457, FSTC 469, FSTC 471, FSTC 485, FSTC 489, FSTC 491, HORT 419, HORT 420, HORT 421, HORT 446, NUTR 211, POSC 406.

**** Students may achieve a business minor by taking the following courses as free electives: ISYS 209, MGMT 209, FINC 409, MKTG 409.

FOOD SCIENCE COURSE DESCRIPTIONS

FSTC 201 Food Science (3 credits)

The fundamental biological, chemical and physical scientific principles associated with the study of foods; topics include food composition and nutrition, food additives and regulations, food safety and toxicology, food processing, food engineering, food biotechnology, product development and sensory evaluation.

FSTC 210 Horizons in Nutrition and Food Science (2 credits)

Introduction to nutrition and food science career opportunities through presentations by nutrition and food science researchers and industry professionals; addresses issues of professionalism including portfolio development, teamwork, and critical thinking skills. Cross-listed with NUTR 210.

FSTC 300 Religious and Ethnic Foods (3 credits)

Understanding religious and ethnic foods with application to product development, production, and nutritional practices; emphasis on different food rules and priorities with attention given to different religious and ethnic groups within the US and around the world.

Prerequisite: Junior or senior classification or approval of instructor; basic knowledge of food science and nutrition helpful. Cross-listed with NUTR 300.

FSTC 305 Fundamental Baking (3 credits)

Fundamentals of baking; chemical and physical properties of ingredients, methods of baking all products, fundamental reactions of dough, fermentation, and oven baking.

Prerequisite: CHEM 222 or 227 or approval of instructor.

FSTC 307 Meats (3 credits)

Integrated studies of the meat animal processing sequence regarding the production of meat-type animals and the science and technology of their conversion to human food.

Prerequisites: ANSC 107 and 108 or approval of department head. Cross-listed with ANSC 307.

FSTC 311 Principles of Food Processing (3 credits)

Principles and practices of canning, freezing, dehydration, pickling and specialty food manufacture; fundamental concepts of various techniques of preparation, processing, packaging, and use of additives; processing plants visited. (*Only offered in the Fall semester*)

Prerequisite: FSTC 201; junior or senior classification or approval of department head or instructor.

FSTC 312 Food Chemistry (3 credits)

The fundamental and relevant chemistry and functionality of the major food constituents (water, carbohydrates, lipids, proteins, phytochemical nutraceuticals) and study of food emulsion systems, acids, enzymes, gels, colors, flavors and toxins. (Only offered in the Spring semester)

Prerequisite: FSTC 201; CHEM 227; CHEM 237 or approval of department head or instructor.

- FSTC 313 Food Chemistry Laboratory (1 credit), **Approved "W" Course**
Laboratory exercises investigating specific molecules, such as food acids, enzymes, pigments and flavors, and chemical interactions in foods, such as oxidation reactions, emulsion systems, and functional properties from a fundamental chemistry rather than an analytical perspective. (*Only offered in the Spring semester*)
Prerequisite: FSTC 201; CHEM 227; CHEM 237 or approval of department head or instructor.
- FSTC 314 Food Analysis (3 credits)**
Selected standard methods for assay of food components; principles and methodology of both classical and instrumental techniques in food analysis (*Only offered in the Fall semester*)
Prerequisite: FSTC 201; FSTC 311; CHEM 227; CHEM 237 or approval of department head or instructor.
- FSTC 315 Food Processing Engineering Technologies (3 credits)**
Elementary mechanics, power transmission, steam and steam boilers, pipes and pipe fitting, refrigeration and insulation, temperature measurement and control, electric motors, disposal of waste products, and mechanical problems as applied to foods and food processing. (*Only offered in the Spring semester*)
Prerequisite: FSTC 201; PHYS 201; junior or senior classification or instructor approval. Cross-listed with AGSM 315.
- FSTC 326 Food Bacteriology (3 credits)**
Microbiology of human foods and accessory substances. Raw and processed foods; physical, chemical and biological phases of spoilage. Standard industry techniques of inspection and control.
Prerequisite: BIOL 206 or approval of instructor; junior or senior classification. Cross-listed with DASC 326.
- FSTC 327 Food Bacteriology (1 credit)**
Laboratory to accompany FSTC 326. Cross-listed with DASC 327.
- FSTC 330 Dairy and Food Technology. (4 Credits)**
Principles and practices involved in processing of milk into market milk, butter, cheese and cheese foods; fundamental principles of these processes as related to their design and control. Cross-listed with DASC 330.
- FSTC 331 Dairy and Food Technology. (4 Credits)**
Manufacture of frozen, freeze-dehydrated, concentrated and dehydrated dairy foods; fundamental aspects of freezing, concentration and dehydration of foods.
Prerequisite: FSTC 330 or approval of department head. Cross-listed with DASC 331.
- FSTC 401 Food Product Development (3 credits)**
Design and develop food products using principles of food chemistry, food processing, nutrition, sensory analysis and statistics; team collaborates to improve food product characteristics to meet the needs of a changing society.
Prerequisite: FSTC 201, FSTC 311, FSTC 312, FSTC 313, FSTC 314, FSTC 315, FSTC 326 or registration therein; senior classification or approval of instructor.
NOTE: TAKE THIS COURSE YOUR LAST SPRING SEMESTER.

- FSTC 406 Poultry Processing and Products (4 credits) **Approved “W” Course**
The science and practice of processing and products of poultry and eggs; physical, chemical, microbiological and functional characteristics of value-added poultry products as they affect consumer acceptance, efficiency of production, and regulatory approval.
Prerequisite: DASC 326/FSTC 326; CHEM 222; POSC 309; junior or senior classification or approval of instructor. Cross-listed with POSC 406.
- FSTC 410 Nutritional Pharmacometrics of Food Compounds (3 Credits)**
Nutritional pharmacokinetics and pharmacodynamics of food compounds; specific examples of toxicological and pharmacological effects of food compounds.
Prerequisites: NUTR 202 or NUTR 203 or FSTC 201 or CHEM 222 or CHEM 227 or approval of instructor; junior or senior classification. Cross-listed with NUTR 410.
- FSTC 440 Therapeutic Microbiology: Probiotics and Related Strategies (3 credits)**
Topics relevant to alimentary (gastrointestinal) microbiology including: (i) the “normal” intestinal microbiota; (ii) probiotic and prebiotic nutritional supplements; (iii) recombinant pharmabiotics; (iv) gut-associated lymphoid tissue and mucosal immunity; (v) foodborne gastrointestinal pathogens; and (vi) fermented products as functional foods.
Prerequisites: Undergraduate survey course in microbiology or approval of instructor; junior or senior classification. Cross-listed with NUTR 440.
- FSTC 444 Fundamentals of Food Law (3 credits)**
History, development of, and fundamental principles behind current food regulations, including food labeling, adulteration, food safety, food additives, dietary supplements, and import and export laws; overview of government agency jurisdiction, international law and ethics.
Prerequisite: FSTC 201; junior or senior classification.
- FSTC 446 Commercial Fruit and Vegetable Processing (3 credits)**
Pilot plant and laboratory operations pertaining to processed fruits, vegetables and beverages; new product development emphasized via individual laboratory projects.
Prerequisite: FSTC 311. Cross-listed with HORT 446. (Offered in even numbered years.)
- FSTC 457 Hazard Analysis and Critical Control Point System (3 credits)**
Hazard Analysis and Critical Control Point (HACCP) principles specifically related to meat and poultry; microbiological and process overviews; good manufacturing practices and standard operating procedures development. (Only offered in the Fall semester)
Prerequisite: FSTC 326 or approval of instructor. Cross-listed with ANSC 457.
- FSTC 469 Experimental Nutrition and Food Science Laboratory. (4 credits)**
Investigation of nutritional intervention in animal models of metabolic and psychological disorders (e.g. obesity and depression); investigational approaches: behavioral analyses; RNA and protein analyses; reverse transcription PCR.
Prerequisites: CHEM 227; CHEM 237; junior or senior classification or approval of instructor. Cross-listed with NUTR 369.

- FSTC 471 Critical Evaluation of Nutrition and Food Science Literature (3 credits)**
Evaluation of scientific literature, research methods within in the literature, and the quality of scientific studies to produce an evidence-based review in areas specific to nutrition and food science.
Prerequisites: NUTR 202 or 203 and STAT 302; Junior or Senior classification; knowledge of technical writing helpful. Cross-listed with NUTR 471.
- FSTC 481 Seminar (1 credit) ** Approved "C" Course**
Guidelines and practice in journal article review and making effective technical presentations; strategies for conducting a job search; development of resumes and letters and interviewing targeted for careers in the food industry or graduate school.
Prerequisite: Senior classification in food science and technology.
NOTE: TAKE THIS COURSE YOUR LAST FALL SEMESTER.
- FSTC 487 Sensory Evaluation of Foods. (3 Credits)**
Application of sensory science principles and practices to food systems including an understanding of discriminative, descriptive and consumer sensory techniques;
Prerequisites: CHEM 222 or CHEM 228; junior or senior classification. Cross-listed with ANSC 487.
- FSTC 497 Applied Microbiology for Foods of Animal Origin: Processing, Sanitation and Sanitary Design. (3 Credits)**
Application of basic food microbiology knowledge and principles to food production processes and products; sources of microbiological contamination and their impact on food safety and spoilage; application of sanitary design and validation; testing and auditing to monitor and trouble-shoot the process.
Prerequisite: DASC 326 or FSTC 326 or FSTC 606 or equivalent. Cross-listed with ANSC 497.

UNDERGRADUATE SUPPORTING COURSES

- ACCT 209 Survey of Accounting Principles (3 credits)**
Accounting survey for non-business majors; non-technical accounting procedures, preparation and interpretation of financial statements and internal control. May not be used to satisfy degree requirements for majors in business. Business majors who choose to take this course must do so on a satisfactory/unsatisfactory basis.
- ACCT 229 Introductory Accounting. (3 Credits)**
Analysis, recording and reporting of business transactions; partnership and corporation accounting; analysis and use of financial statements.
Prerequisite: Sophomore classification.
- AGEC 105 Introduction to Agricultural Economics (3 credits)** Characteristics of our economic system and basic economic concepts; survey of the farm and ranch firm and its organization and management; structure and operation of the marketing system; functional and institutional aspects of agricultural finance; government farm programs.
- AGEC 314 Marketing Agricultural and Food Products (3 credits)**
Operations involved in movement of agricultural commodities from farmer to consumer via several intermediaries; functions involve buying, selling, transportation, storage, financing, grading, pricing and risk bearing; agricultural supply chain or value chain is studied in detail; marketing aspects of commodities and differentiated goods.
Prerequisites: AGEC 105 or 3 hours of economics; and junior or senior classification.
- BIOL 111 Introductory Biology (4 credits)**
First half of an introductory two-semester survey of contemporary biology that covers the chemical basis of life, structure and biology of the cell, molecular biology and genetics; includes laboratory that reinforces and provides supplemental information related to the lecture topics..
- BICH 303 Elements of Biological Chemistry (3 credits)**
Survey of the biochemical sciences designed for the non-biochemistry major; introduction to the chemistry and metabolism of biologically important molecules, the biochemical basis of life processes, cellular metabolism and regulation. Students requiring biochemistry in greater depth should register for BICH 410 and BICH 411. Not open to biochemistry majors.
Prerequisite: CHEM 222 or equivalent.
- BICH 410 Comprehensive Biochemistry I (3 credits)**
Structure, function and chemistry of proteins and carbohydrates; kinetics, mechanisms and regulation of enzymes; metabolism of carbohydrates. Not open to biochemistry or genetics majors.
Prerequisite: CHEM 228 or approval of instructor.
- CHEM 101 Fundamentals of Chemistry I (3 credits)**
Introduction to modern theories of atomic structure and chemical bonding; chemical reactions; stoichiometry; states of matter; solutions; equilibrium; acids and bases; coordination chemistry.

- CHEM 111 Fundamentals of Chemistry I Laboratory (1 credit):** introduction to methods and techniques of chemical experimentation; qualitative and semi-quantitative procedures applied to investigative situations.
Prerequisite: CHEM 101 or registration therein.
- CHEM 102 Fundamentals of Chemistry (3 credits)**
Theory and applications of oxidation-reductions systems; thermodynamics and kinetics; complex equilibria and solubility product; nuclear chemistry; descriptive inorganic and organic chemistry.
Prerequisites: CHEM 101 or CHEM 107 or their equivalent. . Concurrent registration in CHEM 112 suggested.
- CHEM 112 Fundamentals of Chemistry II Laboratory (1 credit):** introduction to analytical and synthetic methods and to quantitative techniques to both inorganic and organic compounds.
Prerequisites: CHEM 101 and 111 or equivalent; CHEM 102 or registration therein.
- CHEM 222 Elements of Organic and Biological Chemistry (3 credits)**
Organic chemistry and its applications to biological and agricultural chemistry including chemistry of functional groups, acid-base and redox chemistry, stereochemistry and chemistry of important biological compounds. Not to be used as the basis for further study in organic chemistry or biochemistry. *Prerequisite:* CHEM 101 or 103.
- CHEM 227 Organic Chemistry I (3 credits)**
Introduction to chemistry of compounds of carbon. General principles and their application to various industrial and biological processes.
Prerequisite: CHEM 102 or 104. Concurrent registration in CHEM 237 is suggested.
- CHEM 228 Organic Chemistry II (3 credits)**
Continuation of CHEM 227.
Prerequisite: CHEM 227. Concurrent registration in CHEM 238 is suggested.
- CHEM 237 Organic Chemistry Laboratory (1 credit)**
Operations and techniques of elementary organic chemistry laboratory; preparation, reactions and properties of representative organic compounds.
Prerequisites: CHEM 102 or 114; CHEM 227 or registration therein.
- CHEM 238 Organic Chemistry Laboratory (1 credit)**
Continuation of CHEM 237. *Prerequisites:* CHEM 237; CHEM 228 or registration therein.
- CHEM 242 Elementary Organic Chemistry Laboratory (1 credit)**
Operations and techniques of elementary organic chemistry laboratory with emphasis on experiments for students of agriculture. *Prerequisite:* CHEM 222 or registration therein.

- CHEM 316 Quantitative Analysis (Credit 2)**
An introduction to quantitative methods of analysis with emphasis on chemical equilibria of analytical useful reactions and processes important in advanced analytical methods, including electrochemistry.
Prerequisite: CHEM 102 or 104
- CHEM 318 Quantitative Analysis Laboratory (1 credit)**
Laboratory work consists of selected experiments in quantitative analysis designed to typify operations of general application; work is primarily volumetric with limited gravimetric experiments.
Prerequisites: CHEM 102 or 114; CHEM 315 or 316 or registration therein.
- ENGL 104 Composition and Rhetoric (3 credits)**
Focus on referential and persuasive researched essays through the development of analytical reading ability, critical thinking and library research skills; **for U1 and U2 students only.**
- ENGL 210 Scientific & Technical Writing (Credit 3) –**
Principles of composition and rhetoric applied to the basic genres of scientific and technical writing, including the report, proposal and manual.
Prerequisite: ENGL 104.
- ENGL 241 Advanced Composition (Credit 3) NOTE: Can be substituted for ENGL 210**
Focuses on the writing of advanced academic and professional prose by integrating computer technology in the analysis and production of that prose.
Prerequisite: ENGL 104
- MATH 141 Business Mathematics I (3 credits)**
Linear equations and applications, linear forms and systems of linear equations, matrix algebra and applications, linear programming (graphical and simplex methods), probability and applications, statistics.
Prerequisites: High school algebra I and II and geometry. Credit will not be given for more than one of MATH 141 or 166.
- MATH 142 Business Mathematics II (3 credits)**
Derivatives, curve sketching and optimization, techniques of derivatives, logarithms and exponential functions with applications, integrals, techniques and applications of integrals, multivariate calculus.
Prerequisites: High school algebra I and II and geometry or satisfactory performance on a qualifying examination. Credit will not be given for more than one of MATH 131, 142, 151 and 171.
- MGMT 209 Business, Government and Society. (3 Credits)**
Impact of the external environment-legal, political, economic and international-on business behavior; market and non-market solutions to contemporary public policies confronting business persons examined including antitrust law, employment and discrimination law, product safety regulation, consumer protection and ethics. May not be used to satisfy degree requirements for majors in business.
Prerequisites: Sophomore classification; for students other than business and agribusiness majors.

- MGMT 309 Survey of Management (3 credits)**
Survey of the basic functions and responsibilities of managers; includes the environmental context of management, planning and decision making, organization, structure and design, leading and managing people, and the controlling process; issues of globalization, ethics, quality and diversity integrated throughout the course
Prerequisites: Junior classification; for students other than business and agribusiness majors.
- NUTR 202 Fundamentals of Human Nutrition (3 credits)**
Understand the basic chemistry and function of carbohydrates, lipids, proteins, vitamins, minerals and water Learn how these nutrients are digested, absorbed, and metabolized
Apply knowledge gained for personal dietary adequacy and optimal health
- NUTR 211 Scientific Principles of Foods (4 credits)**
Basic principles underlying selection, preparation and preservation of food in relation to quality standards, acceptability and aesthetics. Introduction to composition, nutritive value, chemical and physical properties of foods; introduction to experimental study of foods.
Prerequisites: Completion of NUTR 202 or 203, CHEM 101/111 or instructor approval.
- PHYS 201 College Physics (4 credits)**
Fundamentals of classical mechanics, heat, and sound. Primarily for architecture, premedical, pre-dental, and pre-veterinary medical students.
Prerequisite: MATH 103 or equivalent.
- POLS 206 American National Government (3 credits)**
Survey of American national government, politics, and constitutional development.
- POLS 207 State and Local Government (3 credits)**
Survey of state and local government and politics with special reference to the constitution and politics of Texas.
- STAT 302 Statistical Methods (3 credits)**
Intended for undergraduate students in the biological sciences and agriculture (except for agricultural economics). Introduction to concepts of random sampling and statistical inference; estimation and testing hypotheses of means and variances; Analysis of variance; regression analysis; chi-square test. Credit will not be allowed for more than one of STAT 301, 302 or 303. *Prerequisite:* MATH 141 or 166 or equivalent.

FINANCIAL AID, SCHOLARSHIPS AND TUITION REBATES

Financial Aid

Financial aid consists of scholarships and grants, loans and part-time employment. To determine your eligibility to receive financial assistance, you must submit the Free Application for Federal Student Aid (FAFSA) each academic year. You may access the electronic version of the FAFSA online at www.fafsa.ed.gov. To contact a financial aid counselor call (979) 845-3236.

Information concerning tuition, fees, and financial aid is published in the Texas A&M University Undergraduate Catalog or online at <http://financialaid.tamu.edu/>.

Scholarships:

- **Department of Nutrition & Food Science (for continuing students)**
 - Deadline: Check with the Advising Office- typically February 1st.
 - Students are recognized at the Department Banquet during Parent's Weekend.
 - Amounts vary depending upon scholarship
 - Scholarship application will be posted at <http://nfs.tamu.edu>
- **Institute of Food Technologists**
 - Deadline: Check Website www.ift.org *dependent upon classification*
 - Amounts vary
 - IFT has scholarships for incoming freshmen in Food Science.
- **Texas Food Processors Association**
 - Deadline: Usually in October.
 - Applications available in the advising office and online at <http://nfs.tamu.edu>
 - Amounts vary.
- **Alamo and Longhorn IFT**
 - Deadline: Usually in October.
 - Applications available in the advising office and online at <http://nfs.tamu.edu>
 - Amounts vary.

Refund of Tuition and Fees: A student may drop courses during the first four days of a fall or spring semester. Refunds will not be issued for classes dropped after the 12th class day of a full semester. Please see the TAMU official academic calendar for specific dates.

Tuition Rebate: Certain undergraduate students who attempt not more than three hours in excess of the minimum number of semester credit hours required to complete the degree in the catalog under which they will graduate may be entitled to a \$1,000 rebate if they meet the criteria. Students must apply PRIOR to commencement during their last term. Several conditions apply and students must meet all specified criteria.

HELPFUL WEBSITES

- TAMU homepage: <http://www.tamu.edu/>
- Department of Nutrition and Food Science: <http://nfs.tamu.edu>
- Office of Admissions and Records: <http://www.tamu.edu/admissions/>
- Student Financial Aid: <http://financialaid.tamu.edu>
- TAMU Student Organizations: <http://getinvolved.tamu.edu/>
- Institute of Food Technologists: www.ift.org

STUDENT ORGANIZATIONS

A broad education involves not only course work to develop professional expertise and knowledge, but also learning and developing social and leadership skills. Students are encouraged to become actively involved in on-campus and off-campus organizations. Food Science students often choose to participate in one or more of these groups:

Institute of Food Technologists Student Association - Texas A&M Chapter

- Supports and encourages both undergraduate and graduate students enrolled in the Food Science and Technology program. Members may attend presentations by food industry representatives, participate in fundraising and social activities, visit local food production facilities, and travel to regional and/or state professional conferences and events.

IFT National Student Association

- Food Science and Technology majors may apply for student membership in the Institute of Food Technologists (IFT), thus automatically becoming members of the IFT Student Association. The IFT Student Association offers special services and activities, including area meetings, Food Product Development team competition, special programs at the IFT Annual Meeting, research paper competitions, Student Chapter of the Year competition, and Food Technology College Bowl. The IFT Student Association, which is run by and for the students, also provides students a voice in IFT affairs and committees.

Links to Some of the Largest Food Companies

- Phillip Morris Co., Inc. / www.kraftfoods.com
- Pepsico, Inc. / www.pepsico.com
- Coca-Cola, Inc. / www.cocacola.com
- ConAgra, Inc. / www.healthychoice.com
- Del Monte, Inc / <http://www.delmonte.com/Company>
- Heinz / <http://www.heinz.com>
- IBP, Inc. / www.ibpinc.com
- Anheuser-Busch Co., Inc. / www.budweiser.com
- Campbell Soup Co. / www.campbellsoups.com
- Seagram Co. / www.seagram.com
- Kellogg Co. / www.kelloggs.com
- Tyson Foods, Inc. / www.tyson.com
- General Mills / www.general-mills.com
- Quaker Oats Co. / www.quakeroats.com
- Proctor & Gamble / www.pg.com
- Hershey Foods / www.hersheys.com