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Welcome

Welcome to the Food Science track in the Department of Human Nutrition, Food and Animal Sciences. This study track educates and develops skills in students who desire to work in food processing, regulation and food business arena, both in the public and private sector. This track also prepares students for managerial positions since there is a high demand for people with skills in food science and knowledge of business, accounting, and interpersonal skills. Students learn about food chemistry, microbiology, structure, engineering, safety, regulation, sanitation, quality control, and business-oriented courses.

Note: Every effort has been made to ensure that the material in this handbook is accurate, up-to-date and complete. However, occasionally errors and changes occur. It is always a good idea to double check with your advisor before taking any course, which is one of the reasons the department requires mandatory advising of all students. For those not yet in the program and would like to make sure they are on the right track please feel free to contact the CTAHR academic advisors (e-mail: ctahradv@hawaii.edu; schedule your appointment at https://ctahradv.youcanbook.me/).

Admission into the University of Hawai‘i Food Science Track

Undergraduate students interested in the Food Science track may apply either as freshmen, upperclassmen, or as transfer students at any time of the year once admission requirements are met. Freshmen may declare at the time of application or within their first semester. Students who want to transfer into the Food Science and Human Nutrition (FSHN) major, Food Science track are required to have a minimum GPA of 2.0. There are three different options under the Food Science track: Pre-professional, Business, and Culinology (only for KCC graduates with AS in CULN).

Students who have taken courses at another university or community college outside of the University of Hawai‘i system must arrange to have their official transcripts sent to the UH Mānoa Admissions Office for evaluation of transfer credits. Courses not meeting the university core requirements, but are acceptable academically, will be transferred and counted as elective credits. Check online to the “Transfer of Credits” website within the UH Admissions office to see how your courses transfer to UH. http://www.hawaii.edu/transferdatabase/

Upon entering the program, students will be required to meet with academic advisors to identify their career objectives and select an appropriate option for study. Contact the CTAHR academic advisors at ctahradv@hawaii.edu or schedule an appointment at https://ctahradv.youcanbook.me/.
Where are we located?
Agricultural Science Building
1955 East West Road, Room 216
Department of Human Nutrition, Food and Animal Sciences
Home of DTCS, FSHN, and ANSC majors
Bachelor of Science (BS) in Food Science and Human Nutrition

Track: Food Science

Admissions: Freshmen = Open / Transfer = Min. Criteria    Process: Declaration

Min. Total Credits: 120 (Business = 106-107 + 13-14 in electives; Pre-Professional = 105 + 15 in electives)

UHM General Education Core Requirements

| Foundations | FS MATH 140, 161, 203, 215, 241, NREM 203, BUS 250 |
| FG (A / B / C) |
| FG (A / B / C) |

| Diversification | DA COMG 151 or 251 |
| DH / DL |
| DB BIOL 171 |
| DP CHEM 161, 171 |
| DY BIOL 171L, CHEM 171L |
| DS |
| DS |

* See degree, college and major requirements for courses that can also fulfill these.

UHM Graduation Requirements

Focus

| H |
| E (300+) |
| O (300+) |
| W |
| W |
| W |
| W (300+) |
| W (300+) |

Hawaiian / Second Language

- The Hawaiian or Second Language requirement is not required for students admitted to the Food Science and Human Nutrition program.

Credit Minimums

- 120 total applicable
- 30 in residence at UHM
- 45 upper division (300+ level) credits

Grade Point Average

- 2.0 cumulative or higher (Note: Other GPAs may be required)
- Good academic standing

College Requirements

CTAHR Required Set of Interrelated Courses

- COMG 151 or 251
- NREM 310, ECON 321, SOCS 225, EDEP 429
- Internship or capstone course (FSHN 494)

Credit Minimums

- 120 total applicable

This program sheet was prepared to provide information and does not constitute a contract. See back for major requirements. Meet regularly with your major advisor.
Major Requirements for BS in Food Science and Human Nutrition

Admission: Freshmen = Open; Transfer = Min. entrance GPA of 2.5 and have taken FSHN 185 (with a “B” or better) and CHEM 161/161L, CHEM 162/162L, and MATH 140 (or higher) (with a “C” or better).

Application: Freshmen = NA; Transfer = Must meet with FSHN advisor.

Min. major credits: Business Option = 84; Pre-Professional Option = 81

Requirements

Food Science and Human Nutrition Required Supporting Courses (28 credits)

- BIOL 171*DB / 171L*DY
- CHEM 161*DP / 161L*DY or CHEM 171*DP
- CHEM 162*DP / 162L*DY or CHEM 171L*DY
- CHEM 272*DP
- MATH 140, 161, 203, 215, 241, NREM 203, or BUS 250

Food Science Core Courses (32 credits)

All of the following:

- FSHN 181 / FSHN 181L*DY
- FSHN 185*DB
- FSHN 411
- FSHN 445
- FSHN 381
- FSHN 430
- FSHN 381L
- FSHN 430L
- FSHN 430L
- FSHN 403

Food Science Options (choose only one option)

Business Option (18-19 credits)

- ACC 201
- ECON 130
- BUS 312
- IS 250*
- BUS 315

Pre-Professional Option (15 credits)

- CHEM 272L
- MATH 216
- CHEM 273
- PHYS 152
- MATH 215

Notes

CTAHR Academic Advising Office:
Gilmore 1st floor; ctahradv@hawaii.edu

Appointments are required to see an advisor; please visit ctahradv.youcanbook.me/ to schedule an appointment.

CTAHR Office of Academic and Student Affairs:
Gilmore 210, (808) 956-8183/(808) 956-6733; www.ctahr.hawaii.edu/ugadvising
### University of Hawai‘i at Mānoa – Four-Year Academic Plan 2017-2018

**Colleges of Tropical Agriculture and Human Resources**

**Bachelor of Science (BS) in Food Science and Human Nutrition**

**Track:** Food Science **Option:** Business

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

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<thead>
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<th>Year 3</th>
<th>Year 4</th>
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<td><strong>Fall</strong></td>
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<td>BUS 312</td>
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<td>FSHN 494</td>
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<td>89</td>
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**Notes:**

- Students must take placement exams to be able to register for CHEM 161.
- Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.
- Minimum 45 upper division (300+ course) credits are required.
- *or approved substitute: EDEA 360, FAMR 350, COMG 352, COMG 381

Rev 7/16
*Student MUST work in Gen. Ed. and Focus requirements not shown on this guideline
### University of Hawai‘i at Mānoa – Four-Year Academic Plan 2017-2018

**Colleges of Tropical Agriculture and Human Resources**

**Bachelor of Science (BS) in Food Science and Human Nutrition**

**Track:** Food Science  **Option:** Pre-Professional

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

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<th>Year 2</th>
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<th>Year 4</th>
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<td><strong>Fall</strong></td>
<td><strong>Fall</strong></td>
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| Credits | 14 | Credits | 14 | Credits | 15 | Credits | 16 |

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<td>FSHN 181</td>
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<td>PHYS 151</td>
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<td>FSHN 181L</td>
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<td>NREM 310</td>
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</table>

| Credits | 15 | Credits | 16 | Credits | 16 | Credits | 14 |

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**Notes:**

- Students must take placement exams to be able to register for CHEM 161.
- Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.
- Minimum 45 upper division (300+ course) credits are required.
*Student MUST work in Gen. Ed. and Focus requirements not shown on this guideline
**UHM General Education Core Requirements**

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<th>Foundations</th>
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<td>FW</td>
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<td>FS</td>
<td>MATH 140, 161, 203, 215, 241, NREM 203, BUS 250</td>
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<td>DB</td>
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<td>DP</td>
<td>CHEM 161, 171</td>
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<td>DY</td>
<td>BIOL 171L, CHEM 171L</td>
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<td>DS</td>
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* See degree, college and major requirements for courses that can also fulfill these.

**UHM Graduation Requirements**

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**Hawaiian / Second Language**

- The Hawaiian or Second Language requirement is **not** required for students admitted to the Food Science and Human Nutrition program.

**Credit Minimums**

- 120 total applicable
- 30 in residence at UHM
- 45 upper division (300+ level) credits

**Grade Point Average**

- 2.0 cumulative or higher (Note: Other GPAs may be required)
- Good academic standing

---

*This program sheet was prepared to provide information and does not constitute a contract. See back for major requirements. Meet regularly with your major advisor.*
**Major Requirements for BS in Food Science and Human Nutrition**

Admission: Freshmen = Open; Transfer = Min. entrance GPA of 2.5 and have taken FSHN 185 (with a “B” or better) and CHEM 161/161L, CHEM 162/162L, and MATH 140 (or higher) (with a “C” or better).

Application: Freshmen = NA; Transfer = Must meet with FSHN advisor.

Min. major credits: Culinology Option = 21

Must have an A.S. degree in Culinary Arts with a specialization in Institutional Food Service Management from Kapiolani Community College.

### Requirements

#### Food Science and Human Nutrition Required Supporting Courses (12 credits)

- CHEM 161*DP / 161L*DY
- MICR 130*DB / MICR 140L DY
- MATH 100 or above

#### Food Science Courses for Culinology Option (24 credits)

All of the following:
- FSHN 185*DB
- FSHN 430*DP
- FSHN 494
- FSHN 381*DB
- FSHN 430L*DY
- FSHN 460
- FSHN 403
- FSHN 430*
- FSHN 492

#### Culinology Electives (12 credits; see department for other approved courses)

- FSHN 312
- FSHN 445
- FSHN 494 (repeatable once)
- BUS 315
- TIM 313
- TIM 315
- FSHN 350
- FSHN 475
- FSHN 499
- BUS 312
- FSHN 411*DB
- FSHN 477
- FSHN 477L*DY
- FSHN 440*DB

### Notes

CTAHR Academic Advising Office:
Gilmore 1st floor; ctahradv@hawaii.edu

Appointments are required to see an advisor; please visit ctahradv.youcanbook.me/ to schedule an appointment.

CTAHR Office of Academic and Student Affairs:
Gilmore 210, (808) 956-8183/(808) 956-6733; www.ctahr.hawaii.edu/ugadvising
# University of Hawai‘i at Mānoa – Four-Year Academic Plan 2017-2018

**Colleges of Tropical Agriculture and Human Resources**

**Bachelor of Science (BS) in Food Science and Human Nutrition**

Track: Food Science Option: Culinology

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

<table>
<thead>
<tr>
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<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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<td>FSHN 494</td>
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**Notes:**

Students must take placement exams to be able to register for CHEM 161.

Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.

Minimum 45 upper division (300+ course) credits are required.
Approved UHM Foundations Courses – UHM Core Requirements
A complete course list is available online at http://www.catalog.hawaii.edu/corerequirements/index.html

Foundations Requirement: 12 credits
The Foundations requirements are intended to give students skills and perspectives that are fundamental to undertaking higher education. Students complete the Foundations requirements during their first year at UH Mānoa. Courses taken to fulfill the Foundations requirements may not be used to fulfill Diversification or Focus requirements.

Written Communication (FW): 3 credits
Written Communication courses introduce students to the rhetorical, conceptual, and stylistic demands of writing at the college level; courses give instruction in composing processes, search strategies, and composing from sources. Courses also provide students with experiences in the library and on the internet and enhance their skills in accessing and using various types of primary and secondary materials.

FW Course Options

- AMST 111 Introduction to American Studies Writing
- ENG 100, 100A Composition I
- ENG 190 Composition for Transfer Students
- ELI 100 Expository Writing: A Guided Approach

Symbolic Reasoning (FS): 3 credits
Symbolic Reasoning courses expose students to the beauty and power of formal systems, as well as to their clarity and precision; courses do not focus solely on computational skills. Students learn the concept of proof as a chain of inferences. They learn to apply formal rules or algorithms, engage in hypothetical reasoning, and traverse a bridge between theory and practice. In addition, students develop the ability to use appropriate symbolic techniques in the context of problem solving and to present and critically evaluate evidence.

FS Course Options

- MATH 140** Precalculus
- MATH 161 Precalculus and Elements of Calculus for Economics and the Social Sciences
- MATH 203** Calculus for Business and Social Sciences
- MATH 215** Applied Calculus I
- MATH 241** Calculus I
- MATH 251A** Accelerated Calculus I
- NREM 203 Applied Calculus for Management, Life Sciences, and Human Resources

* Has a prerequisite.
** Requires placement by Math Department's Precalculus Assessment; visit https://math.hawaii.edu/wordpress/.

Global and Multicultural Perspectives (FG): 2 courses, 6 credits
Global and Multicultural Perspectives courses provide thematic treatments of global processes and cross-cultural interactions from a variety of perspectives. Students will gain a sense of human development from prehistory to modern times through consideration of narratives and artifacts from diverse cultures. At least one component of each of these courses will involve the indigenous cultures of Hawai‘i, the Pacific, or Asia.

FG Course Options
To satisfy this requirement, students must take a total of six credits; the six credits must come from two different groups
Group A (FGA; courses cover the time period prehistory to 1500)
- ANTH 151, 151A Emerging Humanity
- ART 175 Survey of Global Art I
- HIST 151 World History to 1500
- HIST 161A World Cultures in Perspective
- WS 175 History of Gender, Sex, and Sexuality in Global Perspectives to 1500 CE

Group B (FGB; courses cover the time period 1500 to modern times)
- AMST 150 America and the World
- ANTH 152, 152A Culture and Humanity
- ART 176 Survey of Global Art II
- FSHN 141 Culture and Cuisine: The Global Diversity of Food
- GEOG 102 World Regional Geography
- HAW 100 Language in Hawai‘i: A Microcosm of Global Language Issues
- HIST 152 World History since 1500
- HIST 162A World Cultures in Perspective
- LING 105 Language Endangerment, Globalization, and Indigenous Peoples
- TIM 102 Food and World Cultures
- WS 176 History of Gender, Sex and Sexuality in Global Perspective, 1500 CE to the Present

Group C (FGC; courses cover the time period prehistory to modern times)
- GEOG 151, 151A Geography and Contemporary Society
- LLL 150 Literature and Social Change
- MUS 107 Music in World Cultures
- REL 150, 150A Introduction to the World's Major Religions

For Non-UH System Transfer Students Only
Students who transfer from a non-UH System school with one or more western civilization courses will be required to take only three credits of Global and Multicultural Perspectives. If the course or courses that they have taken are time-period specific, the credits that they take at UH Mānoa must cover a different time period.

Diversification Requirement: 19 credits
The Diversification requirements are intended to assure that every student has exposure to different domains of academic knowledge, while at the same time allowing flexibility in choice of courses for students with different goals and interests.

Students can complete the Diversification requirements over the full four years of their academic program. Students may satisfy the Diversification requirements by taking approved courses for which they meet course prerequisites. Some courses that satisfy Diversification requirements may also simultaneously satisfy Focus or major requirements.
Can a single course satisfy more than one requirement?

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hawaiian/Second Language</th>
<th>Foundations</th>
<th>Diversification</th>
<th>Focus</th>
<th>Major</th>
<th>Minor/Certificate</th>
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<td>Minor/Certificate</td>
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</table>

Diversification (19 credits)

Arts, Humanities, and Literatures (DA, DH, DL): 6 credits
To satisfy this requirement, students must take six credits; the six credits must include two of the three different areas: Arts "DA," Humanities "DH," and Literatures "DL."

Natural Sciences (DB, DP, DY): 7 credits
To satisfy this requirement, students must take three credits in Biological Science "DB," three credits in Physical Science "DP," and one credit of Science Laboratory "DY."

Social Sciences (DS): 6 credits
To satisfy this requirement, students must take a total of six credits from two different departments.

Food Science Required Courses
COMG 151 or COMG 251 (DA)
HWST 107 (Recommended) (DH) (HAP)

The required science courses in the food science curriculum will cover this requirement.

UHM Graduation Requirements

Focus Requirements
The Focus requirements identify important additional skills and knowledge necessary for living and working in diverse communities. Courses fulfilling Focus requirements are offered in departments across the curriculum and vary each semester. To meet a Focus requirement, a course must have official UH Mānoa Focus designation during the semester in which it is taken. Courses taken outside the UH System cannot be used to fulfill Focus requirements. Instead, non-UH System transfer students' Focus requirements are adjusted according to the number of credit hours awarded by UH Mānoa for non-UH System courses.

Focus (course requirement)
Contemporary Ethical Issues (E): one course 300 level and above
Hawaiian, Asian, & Pacific Issues (H): one course
Oral Communication (OC): one course 300 level and above
Writing Intensive (W): five courses, two courses 300 level and above

Food Science Recommended Courses
Any E course
HWST 107 (DH) (HAP)
Any O course
BIOL 171 Lab, FSHN 381, FSHN 403, FSHN 411, FSHN 494, FSHN 492 (Culinology option)

*Designation of Focus courses may change from year to year.

Notes: Second Language (competence at the 202 level) Not required for FSHN students.
Taking Courses at University of Hawaiʻi’s Community Colleges

Many of the University of Hawaiʻi’s Community Colleges offer a variety of courses required by the Pre-professional curriculum. In addition, parking is free! You may decide to attend a community college first; but, keep in mind that there are approximately two years of required upper division courses that are available only at UH Mānoa.

Go to www.hawaii.edu/myuh/manoa to access the on-line registration. Scroll down to: “My UH Registration Information” and then to “My UH All-Campus Info Listing.” You will be able to register on-line at the different campuses. On-line advisors and registration information at each of these campuses are also given.

Career options

Once you get your degree, you can choose a career in one of the largest industries in the world. Food scientists apply microbiology and biochemistry to improve the taste, nutrition, and value of our nation's food supply. They can be employed in science-related positions in quality assurance, product development, research, technical services, and product procurement. Food scientists can also enjoy careers in related fields such as food communication, advertising, and consumer education and protection. There are lots of demand for Food Science graduates from the global brand food manufacturers, i.e. PepsiCo, General Mills, Nestle, Kellogg’s, Kraft and so on, and local industries. Food Science graduates may also choose to pursue pre-professional tracks such as graduate studies and medical school.

Master of Science (MS) in Food Science

The MS in food science offers areas of concentration in food safety and quality, food processing and engineering, food chemistry and biochemistry, food microbiology, product development, and food science education. Graduates have found employment as college instructors, technical personnel in the food industry, regulatory or other governmental agencies, and researchers. Others have pursued further postgraduate studies.

Admission requirements

Academic prerequisites include a bachelor's degree in food science or a closely related field, a minimum grade point average of 3.0, and undergraduate course work in introductory foods, biochemistry, introductory nutrition, and statistics. Motivated students without a food science-related degree may apply, but will be expected to make up undergraduate deficiencies if admitted. Students are strongly encouraged to take chemistry and introductory food courses prior to applying to the program.

Additional requirements include: submission of GRE General Test scores (no minimum score required); two confidential recommendations (using our program's recommendation forms); a TOEFL score of 580 minimum, 600 recommended (250 computer) if a foreign student; a personal resume; and a completed Graduate Admissions Application including statement of objectives. Interviews by phone or in person if in Hawai‘i may be requested by the admissions committee. The deadlines for receipt of all application materials are February 1 for fall semester applicants, and September 1 for spring semester applicants.

Graduate Record Exam

Graduate Record Exam (GRE) scores are often required for graduate programs, especially for combined internship/graduate programs. The 4-hour general GRE test is administered at the University of Hawai‘i in the Queen Lili‘uokalani Center for Student Services in the Testing Center. The cost is currently $205. To prepare for taking the GRE you can either purchase GRE practice books and software from most bookstores and/or you can download a GRE practice test for free from http://www.ets.org/gre/. For further information, contact the Testing Center at 956-3454.
Student Learning Outcomes

Upon completion of the BS in the FSHN Food Science program, students will be able to:

1. Know, apply and critically analyze and evaluate concepts related to the science of food and nutrition with a focus on humans.
2. Develop written & oral skills commensurate with the ability to summarize, evaluate, synthesize, and appropriately communicate scientific concepts to a variety of audiences.
3. Acquire personal characteristics and leadership, management, and human relations skills appropriate to professional practice in careers related to food science and human nutrition.
4. Recognize and use appropriate technologies, such as computer applications and/or food and nutrition laboratory methodologies.
5. Identify and develop skills to gain successful admission into entry level careers or post-graduate education.
6. Develop problem-solving and critical thinking skills.
7. Demonstrate participation in community service.
8. Identify community issues from local to global levels.

Undergraduate FSHN (Council) Student Club

You are encouraged to join the Student FSHN Council for a nominal fee of $5.00/semester. You will have a chance to meet other students in your major and have the opportunity to share information and good times. Often graduating seniors leave behind jobs or career opportunities that are now available to you. Their website is: https://sites.google.com/a/hawaii.edu/uhm-fshn-council/
Useful WEB Sites for Students Entering into the University of Hawai‘i

University of Hawai‘i [http://www.hawaii.edu/]
All information for students including how to apply, academic calendar, financial aid, catalog, transfer credit search, on-campus activities, housing (dorms), parking, etc., can be found on the following websites:
- UH Mānoa General Catalog [http://www.catalog.hawaii.edu/]
- UH Academic Calendar [http://www.hawaii.edu/academics/calendar]

My UH Services [http://myuh.hawaii.edu]
MyUH Services is a mobile-optimized, one stop shop for UH business tasks, form, apps and more. It includes one-click access to services customized for students, faculty and staff across our 10-campus system.

STAR [http://www.star.hawaii.edu]
STAR for students is the online degree tracking system for UH. You can view your degree requirements, register for classes, search for scholarships, and view your transcripts through STAR.

College of Tropical Agriculture and Human Resources Academic Advisors [https://ctahradv.youcanbook.me/]
Use this website to make an appointment with our academic advisors. Advisors can assist you with developing a degree plan and making sure you’re taking the appropriate classes for graduation. Meeting with an academic advisor is mandatory every semester.

College of Tropical Agriculture and Human Resources [http://www.ctahr.hawaii.edu/site]
This website offers information about the world of CTAHR, including undergraduate and graduate programs, financial aid and scholarships, course requirements, publications, research projects, student council, faculty, and staff.

Department of Human Nutrition, Food & Animal Sciences (HNFAS) [http://www.ctahr.hawaii.edu/hnfas/]
This web site shows the different programs, courses, and resources available within the HNFAS department. There is also a link to “Scholarships.”

Food Science Human Nutrition (FSHN) Council [https://sites.google.com/a/hawaii.edu/uhm-fshn-council/]
The FSHN Council strives to nurture students' interest in dietetics, research, community wellness, food service and nutrition by providing the opportunity for students to network with other students, faculty, and professionals in food science, nutrition, and other health-related fields. In addition to enhancing fellowship and facilitating communication, student members are exposed to career information, scholarship opportunities, and community service activities.

General Education – UH Core requirements and class listings can be found at: [http://www.catalog.hawaii.edu/corerequirements/index.html]

Transfer of Credits, Office of Admissions – [http://www.hawaii.edu/transferdatabase/]
This web site shows information on residency requirements and how your credits transfer into UH Mānoa. The UH catalog can also be viewed from this site.
Student Academic Support Services

Access to student academic support services is important to ensure your success while a student at the University of Hawai‘i. Below is a listing of some of these services that can also be found in the University of Hawai‘i catalog (http://www.catalog.hawaii.edu/undergrad-ed/specialprograms.htm) along with appropriate contact information:

**First Year Programs** familiarize students with the array of resources, programs and faculty available at UH providing opportunities to develop personal relationships and enhancing active involvement in the educational process.

**International Student Services** provides assistance to international students who come from more than countries to study at UH. Students are advised and helped to adjust to the local and U.S. cultures.

**Kokua Program (Disability Access Services)** provides disability access services to students with documented physical and/or mental disabilities. Services include alternative media production, counseling, early registration, note-taking, sign language interpreting, technology access, testing accommodations and campus transportation.

**Learning Assistance Center** provides academic counseling and assists students in developing learning skills to increase academic success. Assessment, counseling and support services are also available for students with learning disabilities.

**Mānoa Advising Center** serves as a first point of contact for advising and appropriate referrals for incoming students.

**New Student Orientation Program** offers information sessions for first-time students and transfer students.

**Student Success Center** at Sinclair Library offers students a place to study and provides information and skills and a place for students to work with librarians, mentors, tutors and counselors to meet individual needs.

**Student Support Services** provides academic advising and planning, tutoring and mentoring to increase college retention, academic success and graduation rates.

**Writing Center** provide free services to equip students with appropriate writing skills so they can become better and more confident writers.

Do not hesitate to discuss your needs with your academic advisor who can help refer you to the appropriate resource. Together a “Plan of Action” can be determined and followed to ensure a better outcome. This plan would include measurable objectives, appropriate activities/actions to achieve the objectives and an assessment/evaluation component. An example might be:

- **Objective:** Seek appropriate health and academic resources
- **Action:** Referral to UH Student Health services, Writing Center and Kokua program for testing accommodations
- **Assessment/evaluation:** Health improves and student has been getting excellent grades.
FSHN 101 Success Skills Development in Human Nutrition, Food and Animal Sciences (1) Combined lecture/discussion intended to provide majors in ANSC and FSHN with opportunities to learn about skills, competencies, and university resources necessary to succeed in college. FSHN and ANSC majors only. A-F only. Pre consent. (Cross-listed as ANSC 101)

FSHN 141 Culture and Cuisine: The Global Diversity of Food (3) A timeline of the world history of food and how it relates to culture, diversity, ethnicity, and religion. International food demonstrations and tastings included. FGB

FSHN 181 Introduction to Food Preparation (3) Lectures, discussions, and demonstrations on how food components contribute to the functional, sensory, and safety characteristics of foods, and what changes occur in foods due to preparation, processing, and storage. Co-requisite: 181L.

FSHN 181L Food Preparation Lab (1) (1 3-hr Lab) Experiments in foods emphasizing ingredient function and standard preparation methods for food groups. Co-requisite: 181. DY

FSHN 185 The Science of Human Nutrition (3) Integration of natural science concepts basic to the study of human nutrition. Emphasis on nutrient requirements of healthy individuals, food sources, functions of nutrients. DB

FSHN 244 Comparative Nutrition (3) Digestive systems and nutrient functions, interrelationships and metabolism are compared among animal species, including humans. An intermediate, general nutrition course for Food Science and Human Nutrition and Animal Science majors. Pre: ANSC 200 (or concurrent), CHEM 161/L or higher. (Cross-listed as ANSC 244) DB

FSHN 311 Institutional Food Service Management and Sanitation (3) Critical and essential aspects of managing institutional food service operations and personnel in healthcare settings; understanding menu development and costing, purchasing procedures and inventory control for food and beverages; includes national sanitation exam. Pre: 181 and 181L (or concurrent), or consent.

FSHN 312 Quantity Foods and Institutional Purchasing (3) Quantity food and beverage operations, menu development and costing, dietary menu claims, purchasing procedures, inventory control, procurement, transportation, legislation. Institutional food service sanitation, Hazard Analysis Critical Control Point and National Restaurant Association Certification. Pre: 181 and 181L (with a minimum grade of C), or consent.

FSHN 322 Marketing Nutrition and Food (2) (1 Lec, 1 3-hr Lab) Fundamental marketing principles applied to nutrition and food. Will include concepts such as the psychology of food purchasing decisions and consumer behavior. Field trips and group projects included. Open to non-majors. Pre: 181/181L, 185, 312; or consent.

FSHN 350 Humans, Food, and Animals: Ethics, Issues, and Controversies (3) (2 Lec, 1 3-hr Lab) Ethical issues and other controversies related to human and animal needs; their impact on resource sustainability and quality of life are explored from scientific perspectives. A-F only. Pre: 181 or 185 or ANSC 200 or ANSC 201. (Cross-listed as ANSC 350)

FSHN 370 Lifespan Nutrition (3) Physiological changes and nutritional requirements during human life stages: pre-pregnancy, pregnancy, infancy, childhood, adolescence, adulthood, and older adulthood. Pre: B or better in 185; C or better in CHEM 161/161L; C or better in PHYL 142/142L (or concurrent). DB

FSHN 381 Experimental Foods (3) Experimental approach to study food preparation problems. Applying basic food science research design to conduct experiments, interpret data and write reports. Subject matter used to

FSHN 381L Experimental Foods Laboratory (1) Experimental approach to study food preparation, food formulation, and sensory evaluation with laboratory exercises in a certified kitchen environment. Applying basic food science research design to conduct experiments, interpret data and write reports. A-F only. Pre: 181/181L, CHEM 161/161L. Co-requisite: 381. DY

FSHN 389 Nutritional Assessment (2) Addresses concepts and uses of nutrition assessment tools at individual and community levels. Students will be introduced to national surveys and new, more sophisticated body composition measurements. A-F only. Pre: 185 and 370 (or concurrent).

FSHN 403 Microbiology of Foods (3) Microorganisms encountered in foods; types of food spoilage; microbial hazards in food; methods of food preservation. Pre: MICR 130 and MICR 140L, or consent. DB

FSHN 411 Food Engineering (3) (2 Lec, 1 3-hr Lab) Principles and application of thermodynamics, electricity, fluid mechanics, heat transfer, psychrometry, and material and energy balances of food processing and preservation. Pre: BIOL 171, CHEM 162 or CHEM 181A, MATH 243, PHYS 151 or PHYS 170; or consent. (Cross-listed as BE 411) DP

FSHN 420 Sensors and Instrumentation for Biological Systems (3) Design course focused on fundamentals of electronic interfacing, control and automation, including biological processes. Topics include sensor physics, basic instrumentation, digital communication, and programming of microcontrollers and other portable computer systems. Pre: EE 160, EE 211, and BE 350 or MATH 302 or MATH 307 or EE 326; or consent. (Cross-listed as BE 420)

FSHN 430 Food Chemistry (3) Chemical properties of food constituents studied in relationship to their effects on processing, nutrition, and spoilage. Pre: CHEM 161 and 161L or consent. DP

FSHN 430L Food Chemistry Lab (1) (1 3-hr Lab) Application of different chemical methods in the study of food constituents—proteins, lipids, carbohydrates, pigments, enzymes, etc. Pre: 430 (or concurrent). DY

FSHN 440 Food Safety (3) Discussion of potential microbiological, parasitic, chemical, and natural food hazards; food laws and standards; and related aspects of consumer protection. Pre: 181, BIOL 171, and CHEM 272; or consent. DB

FSHN 445 Food Quality Control (3) Fundamental principles of quality control in the food industry: measurement of quality parameters, utilization and integration of the individual test procedures into grades and standards of quality, sampling, and reporting results.

FSHN 451 Community Nutrition and Nutrition Education (4) (4 Lec) Concepts and methods of nutrition program planning and nutrition education; analysis of nutritional problems of local, national, and international communities; strategies used to educate groups or individuals. A-F only. Pre: 370 and either FAMR 380 or NREM 310; or consent.

FSHN 454 Foundation of Childhood Obesity Prevention in the Pacific (3) Provide students with a basic overview of the causes and effects of childhood obesity, evidence-based approaches, community-based research, and policies to prevent childhood obesity as it relates to the Pacific region. Pre: 185 (with a minimum grade of B). (Summer only)

FSHN 455 Childhood Anthropometric and Dietary Assessment Field Techniques (1) Teaches techniques for measuring anthropometry and collecting dietary intake in children. Online course imitates hands-on training
through partnering with local organizations and the use of technology. Repeatable one time. Pre: 185 (with a minimum grade of B). (Summer only)

**FSHN 456 Child Health and Nutrition Monitoring (1)** Covers topics related to health and nutritional status monitoring and surveillance, including epidemiology, biostatistics, health and nutrition surveillance systems, and the use of technology for conducting these activities. Repeatable one time. Pre: 185 (with a minimum grade of B). (Summer only)

**FSHN 457 Culture and Child Health in the Pacific (3)** In-depth study of culture and child health in the Pacific, including an introduction to the land, people, history, culture, and world views. Explore cultural competency, cultural safety, and multidisciplinary approaches to promote a healthy Pacific. Pre: 185 (with a minimum grade of B). (Summer only)

**FSHN 460 Food Processing Operations (3)** Principles and applications of food dehydration, thermal processing, low temperature preservation, chemical and biochemical preservation, irradiation, packaging, manufacturing, plant sanitation, water and waste management. Pre: 403 and 430, or consent.

**FSHN 467 Medical Nutrition Therapy I (V)** Development of dietary, anthropometric and clinical lab assessment skills measuring nutritional status. Understanding pathophysiology of disease processes, medical terminology and nutritional intervention, utilizing case studies. Pre: 389 and 486 or consent. DB

**FSHN 468 Medical Nutrition Therapy II (3)** Understanding of the pathophysiology of disease processes and nutritional intervention, using medical terminology and case studies. Pre: 467 or consent. DB

**FSHN 469 Nutrition Counseling Skills (2)** Theory and practice in nutritional counseling. Combined lecture and discussion on nutrition/dietary counseling. Knowledge and theories. Application through lab experiences including role playing, case presentations, and performing actual counseling sessions. A-F only. Pre: 467 (or concurrent) or consent.

**FSHN 475 Applied Human Nutrition (3)** Application of basic nutrition principles; includes sources and functions of essential nutrients and food patterns compatible with nutrient needs, health, disease prevention, and sustainability. Intended for undergraduate and graduate students. Pre: CHEM 161 (or higher) or BIOC 241 (or higher); PHYL 141, BIOL 171; or consent. DB

**FSHN 476 Cultural Aspects of Food Habits (3)** Study of eating from behavioral perspectives. Implications for health practitioners and health education. Pre: two classes from ANTH 151 or higher or SOC 100 or higher or PSY 100 or higher.

**FSHN 477 Food Analysis (2)** Principles of sample preparation and chemical and physical analysis of food components using current methodology. Pre: 430; and CHEM 162 or higher; and BIOL 402 or MBBE 402 or PEPS 402.

**FSHN 477L Food Analysis Lab (2)** (2 3-hr Lab) Application of different chemical and physical methods for the identification and quantitation of food components. Co-requisite: 477. DY

**FSHN 480 Nutrition in Exercise and Sport (3)** Effects of physiologic demands of exercise on nutrition. Emphasis on physiologic and biochemical basis for nutrition recommendations to enhance exercise participation and optimize athletic performance. Pre: 185, and PHYL 103 or 141 or 301. (Cross-listed as KRS 480) DB

**FSHN 485 Nutritional Biochemistry I (3)** Metabolism and biochemistry of carbohydrates, lipids, and proteins, including chemical structure, digestion, absorption, transport, cellular/molecular functions in human nutrition; integration of metabolic pathways; energy metabolism and balance, including relevance to chronic disease. Pre:
185; PHYL 142/142L or PHYL 302/302L; BIOC 341 or higher (or concurrent) or MBBE 402 (or concurrent); or consent. DB

**FSHN 486 Nutritional Biochemistry II (3)** Metabolism and biochemistry of vitamins, minerals, and dietary fiber, including chemical structure, digestion, absorption, transport, and cellular/molecular functions in human nutrition; relevance to establishing nutrient requirements and to mechanisms of chronic disease. Pre: 485 or consent. DB

**FSHN 488 Obesity, Science, and Issues (2)** In-depth study of obesity, including research, etiology, treatment, and prevention. Pre: 480 and 486.

**FSHN 491 Topics in Food Science and Human Nutrition (V)** Study and discussion of significant topics, problems, or laboratory experiments. Repeatable unlimited times. Pre: instructor approval.

**FSHN 492 Field Experience (4)** Integration and application of academic knowledge and critical skills emphasizing professional development. Placement with an approved cooperating supervisor/employer. Writing a learning plan and field report. A-F only. Pre: senior standing in FSHN. (Cross-listed as ANSC 492)

**FSHN 494 Food Science Capstone (3)** Field practicum designed to integrate knowledge from previous FSHN courses to develop novel and innovative food products. Students deal with shelf life, marketing, packaging, labeling, sensory evaluation, and quality assurance. Repeatable one time. FSHN majors only. A-F only. Pre: 381 and 460, or consent.

**FSHN 499 Directed Reading and Research (V)** Repeatable unlimited times.