Cornell Institute of Food Science

Bachelor of Science Program in Food Science

Food Safety Option

Curriculum Outline

Freshman Year

Fall Semester	*Credits*	*Spring Semester*	*Credits*
FDSC 1101 Sci & Tech of Foods	1	FDSC 1102 Leadership & Career Skills in FS	2
CHEM 2070 General Chemistry	4	CHEM 2080 General Chemistry	4
MATH 1110* Calculus	4	MATH 1120* Calculus	4
BIOG ** Biology	3	BIOG ** Biology	3
Freshman Writing Seminar	3	Freshman Writing Seminar	3
	(15)		**(16)**

Sophomore Year

Fall Semester	*Credits*	*Spring Semester*	*Credits*
FDSC 2000 Intro Food Science	3	FDSC 2100 Food Analysis	3
PHYS 1101* General Physics	4	BIOMI 2900 General Microbiology Lec	3
NS 1150 Nutrition and Health	3	BIOMI 2910 Gen Microbiology Lab	2
CHEM 3570 Organic Chemistry	3	CHEM 3580 Organic Chemistry	3
***Soc Science or Humanities	3	***Soc Science or Humanities	3
	(16)		**(14)**

Junior Year

Fall Semester	*Credits*	*Spring Semester*	*Credits*
FDSC 4210 Food Engineering Principles	3	FDSC 4170 Food Chemistry I	3
FDSC 3940 Food Microbiology Lecture	3	COM 2010 Oral Expression	3
FDSC 3950 Food Microbiology Lab	2	BIOMS 4040 Pathogenic Bacteriology	3
BIOMI 4090 Principles of Virology	3	PAM 2100 Statistics	4
***Soc Sci, Humanities or Electives	3	***Soc Sci, Humanities or Elective	3
	(14)		**(16)**

Senior Year

Fall Semester	*Credits*	*Spring Semester*	*Credits*
FDSC 4100 Sensory Evaluation	3	FDSC 4000 Current Issues in Food Science	1
FDSC 4180 Food Chemistry II	3	****FD SC 3960 Food Safety Assurance	2
VTPMD 4640 Intro to Epidemiology	3	FD SC 4250 Unit Operations & Dairy Foods Processing	3
****BIOMI 4100 - Introduction to Chemical and Environmental Toxicology	3	TOX 4970 Risk Analysis & Management	3
**Soc Sci, Humanities, or Electives	3	**Soc Sci, Humanities, and Electives	6
	(15)		**(15)**

Requirements/ Recommendations

* Engineering Math 1910-1920 can be substituted for Math 1110-1120, and Calculus based Physics 2207 can be substituted for Physics 1101 for students interested in Food Process Engineering.

**BIO courses suggested: BIOG 1105-1106; BIOG 1140; BIOG 1440; BIOG 1500; BIOG 1610; BIOG 1780; ANSC 1100; BIOPL 2410

***Students select appropriate career or general electives to bring the total semester hours to the 120 required for graduation. Suggested electives: BIOPL 1120 – Issues in Social Biology: from Diet to Diseases, DNA to Deforestation; BIOMI 3210 – Normal Microbes in Health and Disease; PAM 3280 - Fundamentals of Population Health

****FD SC 3960 and BIOMI 6100 are taught every other year. Make adjustments to your schedule as needed.

Updated October 2011

Description of Courses:

BIOMS 4040 - Pathogenic Bacteriology (also BIOMI 4040)
Spring. 2-3 credits, variable. (3 credits with lec and sem.) Letter grades only. Prerequisites: BIOMI 2900 and BIOMI 2910 . Seminar required for graduate students. Maximum enrollment for seminar portion 11. Instructor: D. P. Debbie. Course in medical microbiology, presenting the major groups of bacterial pathogens important to human and veterinary medicine. Emphasizes infection and disease pathogenesis. Topics include disease causality; interactions of host, pathogen, and environment, including immunity to bacteria; and principles of antimicrobial therapy and drug resistance. A companion seminar addresses the current and classic literature related to microbial pathophysiology on the cellular and molecular levels.

BIOMS 4090 - Principles of Virology (also BIOMI 4090 , PLPA 4090)
Fall. 3 credits. Prerequisite: BIOMI 2900 and BIOMI 2910 or permission of instructor. Recommended prerequisite: BIOMG 3300 –BIOMG 3320 , BIOMG 4320 . Instructor: S. Lazarowitz, N. Osterrieder, and J. Parker.
Covers the principles of virology, focusing mainly on animal viruses but also including plant viruses and bacteriophage. Topics include the classification of viruses, virus entry, genome replication and assembly, and virus pathogenesis. Particular emphasis is placed on virus–host cell interactions and common features between different viral families

TOX 4970/5970 - Risk Analysis and Management (also CEE 5970)
Spring. 3 credits. Prerequisite: introduction to probability and statistics (e.g., CEE 3040 , ENGRD 2700 , ILRST 2100 , BTRY 3010 , or AEM 2100); two semesters of calculus; senior or graduate standing or permission of instructor. Instructor: J. R. Stedinger.
Develops a working knowledge of risk terminology and reliability engineering, analytic tools and models used to analyze safety, environmental and technological risks, and social and psychological risk issues. Discussions address life risks in the United States historical accidents, natural hazards, threat assessment, transportation risks, industrial accidents, waste incineration, air pollution modeling, public health, regulatory policy, risk communication, and risk management.

VTPMD 4640/6640 - Introduction to Epidemiology
Fall. 3 credits. S–U or letter grade option. Co-requisite: BTRY 6010 (College of Agriculture and Life Sciences) or permission of instructor. Instructor: Y. Grohn.
Lectures and discussion deal with the fundamentals of epidemiology. Topics include outbreak investigation, causal association, data quality, the design and ethical constraints of clinical trials, and infectious-disease epidemiology.

BIOMI 4100/6100 - Introduction to Chemical and Environmental Toxicology (also TOX 6100)
Fall 3 credits (Offered alternate even years). Letter grades only. Next offered 2012-2013. Permission of instructor or graduate standing in field is required. Instructor: A. Hay.
Introduction to the general principles of toxicology including the sources, mechanisms, and targets of toxic agents. Gives special attention to the interaction between toxic agents and biological systems at both the organismal and ecological level. The effects of both anthropogenic and natural toxins are examined with respect to genetic and developmental toxicity as well as carcinogenesis and specific organ toxicity.

Suggested Electives:

BIOPL 1120 - Issues in Social Biology: from Diet to Diseases, DNA to Deforestation
Spring or summer. (3-week session.) 3 credits. S-U or letter grade option. Next offered 2012-2013. Instructor: P. J. Davies.
An analysis of current issues of biological relevance and the biological science behind these issues. Topics will include issues such as food and nutrition, antioxidants, organic produce, disease prevention, athletic enhancers, genetic testing, cancer, stem cells and animal cloning, genetically modified crops, bacteria and antibiotics, viruses, risk, statistics and epidemiology, photosynthesis and global warming, extinction and overpopulation, invasive species, resource over-utilization. The topics will vary according to current issues.

BIOMI 3210 - Human Microbes and Health

Spring. 3 credits. Letter grades only. Prerequisites: BIOMI 2900 or permission of instructor. Instructor: R. Ley. The human body is coated with microbes outnumbering "our own" cells 10 to 1, providing us with capacities we have not had to evolve on our own. This course will introduce the microbes of the human body, discuss their origins, adaptations to the body, molecular interactions, and associations with health and disease.

PAM 3280 - Fundamentals of Population Health

Fall. 3 credits. Prerequisites: Sophomore standing or above and at least one of the following courses: HD 1150 , HD 1170 , HD 2180 , HD 2510 , SOC 1101 , DSOC 1101 , DSOC 2200 , PAM 2030 , PAM 3360 , PSYCH 1101 , FGSS 3500 , PAM 3500 . Instructor: J. Carmalt.

Provides students with training in the language, theories, concepts, methods, measurement, analysis, and implementation of population health. A framework of core functions and essential features of population health is used to familiarize students with the unique challenges of disease surveillance, health measurement and monitoring, identification of health indicators and determinants, measuring health disparities, and developing population health policies and programs. Key to this course is the role of epidemiology in evaluating population health, and developing interventions to improve different populations' health and reduce health disparities. Students develop competencies in population health analysis and management such as identification, analysis, evaluation, estimation, inference, implementation, and evaluation that are valued not only in the job market but also welcomed in a variety of research and other employment fields.