

Coursework for the Biological and Agricultural Engineering (BAE) degrees

Seminar

An old humorous definition of a PhD is “someone who studies more and more about less and less until they know everything about nothing”. That degree of focus, to the exclusion of everything else, is not conducive to developing an inquisitive and exploratory view of the world. The BAE seminar series is one method to widen your viewpoint. Attendance at the seminar series is expected of every graduate student every semester while on the Pullman campus.

BAE M.S. Program Requirements

BSYSE 512 Research and Teaching Methods
BSYSE 541 Instrumentation and Measurements

BAE Ph.D. Program Requirements

BSYSE 512 Research and Teaching Methods
BSYSE 541 Instrumentation and Measurements
STAT 512 Analysis of Variance of Designed Experiments

Three credits of mathematics beyond Differential Equations. You may choose from:

MATH 540 Applied Mathematics I
MATH 548 Numerical Analysis

Or other courses approved by the advisors.

Land and Water Engineering Requirements

Core Courses

M.S. students choose two from the three core courses while Ph.D. students take all three courses

BSYSE 556 Surface Hydrologic Processes and Modeling
BSYSE 5XX Nutrient Cycling and Transport (in preparation)
BSYSE 595 Ground-water Flow and Contaminant Transport

Suggested Elective Courses

BSYSE 555 Natural Systems for Wastewater Treatment
BSYSE 557 Watershed Modeling and Management
BSYSE 562 Cropping Systems Modeling (To be revised)
SOILS 513 Soil Physics
SOILS 514 Environmental Biophysics
SOILS 515 Environmental Biophysics Laboratory
SOILS 521 Environmental Soil Chemistry
SOILS 523 Advanced Vadose Zone Hydrology
CE 517 Mechanics of Sediment Transport
CE 518 Hazardous Waste Engineering
CE 527 Advanced Soil Mechanics
CE 551 Open Channel Flow
CE 552 Advanced Topics in Hydraulic Engineering
CE 571 Meteorology
GEOL 569 Hydrogeology Methods (with lab)
GEOL 579 Groundwater Geochemistry
GEOL 584 Stable Isotope Geochemistry
ME 521 Fundamentals of Fluids I
ME 522 Fundamentals of Fluids II

Food Engineering Requirements

Core Courses

M.S. Program

BSYSE 581	Advanced Physical Properties of Foods	3
BSYSE 582	Food Process Engineering Design	3
BSYSE 584	Thermal Processing of Foods	3

Ph.D. Program

M.S. required courses plus two courses from the following list:

BSYSE 583	Food Separation Processes Design	3
BSYSE 586	Food Rheology	3
BSYSE 588	Food Powders	3
BSYSE 587	Food Plant Design	3

Or other food engineering graduate courses

Elective Courses

MS food engineering students should take at least seven credits and Ph.D. student should take at least nine credits from the following list:

FSHN 416	Food Microbiology	2
FSHN 417	Food Microbiology Laboratory	2
FSHN 460	Food Chemistry	3
FSHN 462	Food Analyses	3
FSHN 470	Advanced Food Processing Technologies	3
ME 404	Heat Transfer	3
ME 513	Conduction Heat Transfer	3
ME 514	Thermal Radiation Processes	3
ME 515	Advanced Heat Transfer	3
ME 521	Fundamentals of Fluids I	3
ME 522	Fundamentals of Fluids II	3
EE 517	Numerical Solutions to EM problems	3
EE 518	Advanced Electromagnetic Theory I	3
EE 538	EM Simulation	3
CE 534	Finite Elements	3
CE 556	Numeric Modeling in Fluid Mechanics	3
ChE 441	Process Control	3
ChE 510	Transport Processes	3

And other graduate level courses offered in the CEA

Environmental Engineering Requirements

Core Courses

M.S. students choose two from the three core courses while Ph.D. students take all five courses

BSYSE 556	Surface Hydrologic Processes and Modeling
BSYSE 5XX	Nutrient Cycling and Transport (in preparation)
BSYSE 555	Natural Systems for Wastewater Treatment
CE 541	Environmental Engineering Unit Operations
CE 542	Environmental Engineering Unit Processes

Suggested Elective Courses

BSYSE 595	Ground-water Flow and Contaminant Transport
BSYSE 557	Watershed Modeling and Management
CE515	Environment Measurements
CE 517	Mechanics of Sediment Transport

CE 518	Hazardous Waste Engineering
CE 519	Hazardous Water Treatment
CE 547	Principles of Environmental Engineering
CE 571	Meteorology
SOILS 514	Environmental Biophysics
SOILS 515	Environmental Biophysics Laboratory
SOILS 521	Environmental Soil Chemistry

Biomass Processing and Bioproduct Engineering Requirements

Core Courses

Required for M.S. and Ph.D. students.

BSYSE 594	Advanced Topics in Bioprocessing and Biotreatment
BSYSE 5XX	Biorefinery Process Analysis and Design
BSYSE 5XX	Biochemical, Biofuel and Bioenergy

Suggested Elective Courses

BSYSE 583	Food Separation Process Design
ChE 529	Chemical Engineering Kinetics
ChE 541	Chemical Engineering Analysis
ChE 546	Mass Transfer Operations
ChE 552	Process Optimization
ChE 560	Biochemical Engineering
ChE 575	Introduction to Biochemical Engineering
MBIOS 503	Molecular Biology I
MBIOS 503	Molecular Biology II
MBIOS 506	Molecular Techniques in Microbiology
MBIOS 513	General Biochemistry I
MBIOS 513	General Biochemistry II