

**TABLE (04-04-2018). LIST OF COURSES ELIGIBLE TO COUNT TOWARD 15-CREDIT REQUIREMENT FOR BIOGEOCHEMISTRY DUAL-TITLE PHD DEGREE
(COURSES NOT ON THIS LIST CAN BE APPROVED BY PROGRAM HEAD WHEN JUSTIFICATION IS PROVIDED)**

A	B	C	D	E	F
Biogeochemistry	Biochemistry and Microbiology	Soil Science and Materials Science and Engineering	Water Reactions & Transport	Plant-Microbe Interactions and Plant Systems	Research Tools
A 2-credit Topics in Biogeochemistry course (cross-listed as GEOSC 536, SOILS 536, or CE 536) is offered every other fall semester and counts as 2 credits in any of the six categories					
Organic Geochemistry GEOSC 419 3 credits	Geomicrobiology GEOSC 409W 3 credits	Soil Properties and Functions SOILS 502 3 credits	Geochemistry of Aqueous Systems, GEOSC 522 3 credits	Soil Ecology SOILS 412W 3 credits	Introduction to Isotopes GEOSC 416 3 credits
Mathematical Modeling in Geosciences, GEOSC 561 4 credits	Environmental Soil Microbiology SOILS 512 3 credits	Surface Chemistry, CHEM 448, or Surface Characterization (CHE/MATSE 597A) 3 cr	Principles of Geochemistry GEOSC 533 3 credits	Environmental Biophysics ERM 444 3 credits	Techniques in Environ. Geochemistry GEOSC 413 3 credits
Marine Biogeochemistry GEOSC 411 3 credits	Biological Chemistry CHEM 476 3 credits	Nature of Soil Minerals SOILS 519 3 credits	GEOSC 452 Hydrogeology 3 credits	Ecology of Plant Roots HORT 517 3 credits	Stable Isotope Geochemistry GEOSC 518 3 credits
Evolution of the Biosphere GEOSC 502 4 credits	Environmental Microbiology for Engineers, C E 479 3 credits	Soil Genesis and Classification SOILS 416 3 credits	Hydropedology SOILS 405 3 credits	Plant Nutrition HORT 402W 3 credits	Analytical Separations CHEM 525 3 credits
Kinetics of Geochemical Processes, GEOSC 560 3 credits	General Biochemistry BMB 401 or 402 3 credits	Remediation of Contaminated Soils SOILS 420 3 credits	Watershed Hydrology and Management, FOR 470 3 credits	Techniques and Concepts in Plant Ecophysiology HORT 514 2 credits	Spectroscopic Analysis CHEM 526 3 credits
Ecosystem Nutrient Cycles SOILS 571 3 credits	Lab in Molecular Genetics BMB 445W 3 credits	Soil Genesis SOILS 516 1 credits	Unsaturated Zone Hydrology & Chemical Transport SOILS 504 3 cred	Microbe-Plant Interactions PPEM 405 3 credits	Molecular Spectroscopy CHEM 567 3 credits
Biophysical Chemistry CHEM 540 3 credits	Microbial Physiology and Structure MICRB 401 3 credits	Soil Environmental Chemistry SOILS 513 3 credits	Water Quality Chemistry C E 475 3 credits	Fundamentals of Plant Pathology PPATH 505 3 credits	Spectroscopic Methods in Bioinorganic Chemistry CHEM 538 3 credits
Physical Chemistry- Thermodynamics CHEM 450 3 credits	Microbial Diversity MICRB 413 2 credits	Urban Soils SOILS 404 3 credits	Groundwater Hydrology: Analysis and Modeling C E 555 3 credits	Phytobacteriology PPEM 417 3 credits	Computational Chemistry CHEM 408 3 credits
Physical Chemistry- Quantum Chemistry CHEM 452 3 credits	Biomolecular Structure BMMB 531 2 credits	Soil Morphology Practicum SOILS 403 2 credits	Reactive Transport Processes C E 564 3 credits	Plant Virology: Molecules to Populations PPEM 416 3 credits	Lab of General and Applied Microbiology MICRB 421W 3 credits
Environmental Organic Chemistry, C E 573 3 credits	Biology of Fungi PPEM 425 4 credits	Polymer Chemistry (colisted with Chem) MATSE 543 or CHEM 543, 3 credits	Environmental Aquatic Chemistry C E 570 3 credits	Responses of Crop Plants to Environmental Stress AGRO 518 3 credits	Laboratory in Proteins, Nucleic Acids and Molecular Cloning B M B 442 3 credits
Bioinorganic Chemistry BMMB 538 3 credits	Virus Ecology PPEM 454 3 credits	Functional Polymeric Materials MATSE 575 3 credits	Biological Treatment Processes C E 572 3 credits	Ecology of Agricultural Systems AGRO 510 3 credits	MICRB 412 Microbial Biotechnology 2 credits
Physical Chemistry with Biological Applications B M B 428 3 credits		Solid and Hazardous Wastes C E 476 3 credits	Environmental Transport Processes, C E 576 3 credits	Bioclimatology METEO 563 3 credits	Molecular Biology Lab, MCIBS 593 3 credits
Global Carbon Cycle METEO 561 3 credits		Soil Physics SOILS 507 3-4 credits	Groundwater Remediation C E 578 3 credits	Wetland Ecology GEOG 550 3 credits	Environmental Microbiomes: Concepts and Analysis Tools PPEM 440 3 credits