

2008-09 Course Requirements for BSE Degree – Courses Common to All Option Areas

All courses in this table must be included in calculations used to check the 2.35 GPA program entrance requirement

| Crds | Sem/Yr Taken | Grade | Requirement | Course Taken to Meet Requirement |
|------|--------------|-------|--------------------------------------------------------------------|----------------------------------|
| | | | MATH 221 (5) Calculus and Analytic Geometry | |
| | | | MATH 222 (5) Calculus and Analytic Geometry | |
| | | | MATH 234 (3) Calculus—Functions of Several Variables | |
| | | | Intro Statistics for Engineers (STAT 224 (3) or 324 (3)) | |
| | | | Chemistry (Chem 109 (5) or Chem 103 (4) and Chem 104 (5)) | |
| | | | Comp Sci 310 (3) Problem Solving. | |
| | | | Agr. and Life Science Course (min. of 3 crds from required list) | |
| | | | Biological Sciences (min. 3 crds from required list) | |
| | | | E M A 201 (3 crds) Statics | |
| | | | Physics 202 (5) General Physics | |
| | | | Engineering Graphics Course (M E 170 (2) or M E 231 (2)) | |
| | | | Thermodynamics (M E 361 (3) or CBE 211(3)) | |
| | | | Engineering Economics Course (ISYE 313 (3) or M E 314(3)) | |
| | | | BSE 249 (3) Engr. Principles for Biological Systems or CBE 250 (3) | |
| | | | BSE 364 (3) Engr. Properties of Food and Biological Materials | |
| | | | BSE 365 (3) Measurements and Instrumentation for Biol Systems | |
| | | | BSE 375 (3) Biological Concepts for Engineers | |
| | | | BSE 409 (1) Career Management for Engineers | |
| | | | BSE 509 (3) BSE Senior Design | |

2008-09 Course Requirements for BSE Degree – Natural Resources and Environment Engineering Specialization

All courses in this table must be included in calculations used to check the 2.35 GPA program entrance requirement

| Crds | Sem/Yr Taken | Grade | Requirement | Course Taken to Meet Requirement |
|------|--------------|-------|------------------------------------------------------------------------------------------------------|----------------------------------|
| | | | BSE 372 (2) On-Site Waste Water Treatment | |
| | | | BSE 472 (3) Sediment & Bio-Nutrient Engr. & Mgmt. | |
| | | | BSE 473 (2) Irrigation and Drainage System Design | |
| | | | BSE 571 (3) Small Watershed Engineering | |
| | | | Fluid Mechanics Course (CIV ENGR 310 (3) or M E 363 (3)) | |
| | | | Surveying Course (BSE 201 (1) or CIV ENGR 251 (2)) | |
| | | | Mechanics of Materials Course: EMA 303 (3), 304 (3), 306 (4), or M E 306 (3) | |
| | | | BSE Breadth Course (351(3), 356(3), 367 (3), 441 (3), 460 (3), 475 (3), 476 (3), 542 (3) or 642 (2)) | |
| | | | Technical Elective | |
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| | | | TOTAL– <i>Minimum 44 Credits Required</i> | |

2008-09 Course Requirements for BSE Degree – *Natural Resources and Environment Engineering Technical Electives*

The following courses can be used to meet technical elective requirements for the Natural Resources and Environment Engineering specialization

| Area | Course | Area | Course |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land Information and Surveying | CIV ENGR 301 (1) Intro to Aerial Photographic Systems | General | INTEREGR 160 (3) Intro to Engr. Design (for Freshman only) |
| | CIV ENGR 302 (1) Intro to Electro-optical and Microwave Remote Sensing Systems | | BSE 299 (3 max) Independent Study (requires approval of BSE Undergraduate Instruction and Program Committee) |
| | CIV ENGR 303 (1) Intro to Remote Sensing Digital Image Processing | | BSE 399 (2 max per semester, 3 total) Coordinative Internship/Cooperative Education |
| | CIV ENGR 304 (1) Remote Sensing Visual Image Interpretation and GIS Integration | | Up to 6 credits of math, science, statistics or computer science courses that are designated "advanced", or engineering courses with a 300 or greater course number |
| | CIV ENGR 307 (1) Fund. Computations for Land Information Systems (LIS) | Geotechnical Engineering | CIV ENGR 330 (4) Soil Mechanics |
| | CIV ENGR 308 (1) Spatial Frameworks for LIS | | CIV ENGR 530 (3) Seepage and Slopes |
| | CIV ENGR 357 (4) Intro to Geographic Info Systems | | CIV ENGR 531 (3) Retaining Structures |
| Hydrology | CIV ENGR 315 (3) Hydrology | CIV ENGR 532 (3) Foundations | |
| | CIV ENGR 316 (3) Hydraulic Engineering | Soil Science | SOIL SCI 532 (3) Environmental Biophysics |
| | CIV ENGR 411 (3) Open Channel Hydraulics | | SOIL SCI 622 (3) Soil Physics |
| | CIV ENGR 412 (3) Groundwater Hydraulics | Biological Systems Engineering | BSE 351 (3) Structural Design for Agricultural Facilities |
| | CIV ENGR 414 (3) Hydrologic Design | | BSE 356 (3) Sustainable Residential Construction |
| | GEOLOGY 627 (3 to 4) Hydrogeology | | BSE 367 (3) Renewable Energy Systems |
| | GEOLOGY 629 (3) Contaminant Hydrogeology | | BSE 441 (3) Rheology of Foods & Biomaterials |
| Environmental Engineering | CIV ENGR 320 (3) Environmental Engineering | | BSE 460 (3) Biorefining: Energy & Prod. from Renewable Res. |
| | CIV ENGR 423 (3) Air Pollution Effects, Measurement and Control | BSE 475 (3) Engr Principles-of Ag Machinery | |
| | CIV ENGR 426 (3) Wastewater Treatment Plant Design | BSE 476 (3) Engr Principles of Off-Road Vehicles | |
| | CIV ENGR 427 (3) Solid and Hazardous Wastes Engr. | BSE 542 (3) Food Engineering Operations | |
| | CIV ENGR 429 (3) Environmental Systems Optimization | BSE 642 (2 or 3) Food and Pharmaceutical Separations | |
| Environmental Sciences | Up to a total of 6 credits from the following list can be counted for technical elective: BACT 303, 304, 425, 523; ENVIR ST 361; GEOG 320, 325, 326; SOIL SCI 301, 322, 323, 324, 325, 523, 622 | | |

Four Year Road Map: Natural Resources and Environmental Engineering Specialization

This Road Map is a tool to assist you and your advisor in planning your academic career. Use it along with the Curriculum Sheet for your major, your DARS report, the appropriate checklist in the back of this document, and the Timetable. Your specific program of study could, and probably will, look different. You need to customize the Road Map to fit your situation, and consult with your advisor about the best path for you.

| Year 1 – Fall Semester Course | Credits |
|--------------------------------------------|---------|
| Math 221 - Calculus and Analytic Geometry | 5 |
| Chemistry 109 - Advanced General Chemistry | 5 |
| Social Science (See I.E.4) | 3 |
| EPD 155 – Basic Communication (See I.C.) | 2 |
| | 15 |

| Year 2 – Fall Semester Courses | Credits |
|---------------------------------------------------------|---------|
| Math 234 – Calculus - - Functions of Several Variables | 3 |
| Computer Science 310 - Problem Solving Using Computers | 3 |
| BSE 201 – Surveying | 1 |
| Statistics 224 – Introductory Statistics for Engineers | 3 |
| BSE 249 – Engineering Principles for Biological Systems | 3 |
| Ethnic Studies/International (See I.E. & I.H.) | 3 |
| | 16 |

| Year 3– Fall Semester Courses | Credits |
|-------------------------------------------------------------------|---------|
| BSE 473 – Irrigation and Drainage Systems Design | 2 |
| BSE 364 – Engineering Properties of Food and Biological Materials | 3 |
| CEE 310 – Fluid Mechanics | 3 |
| Technical Elective (See VI.D.) | 3 |
| Technical Elective (See VI.D.) | 3 |
| Technical Elective (See VI.D.) | 3 |
| | 17 |

| Year 4– Fall Semester Courses | Credits |
|--------------------------------------------------------|---------|
| BSE 509 – Biological Systems Engineering Senior Design | 3 |
| BSE 372 – On-Site Wastewater Treatment and Dispersal | 2 |
| ISYE 313 – Engineering Economic Analysis | 3 |
| Humanities (See I.E.3) | 3 |
| Breadth Requirement (See VI.D.) | 3 |
| BSE 409-Career Management for Engineers | 1 |
| | 15 |

| Year 1 – Spring Semester Courses | Credits |
|-------------------------------------------|---------|
| Math 222 - Calculus and Analytic Geometry | 5 |
| Biological Science (See I.F.) | 3 |
| EMA 201-Statics | 3 |
| Economics Course | 4 |
| M E 170 – Civil Engineering Graphics | 2 |
| | 17 |

| Year 2 – Spring Semester Courses | Credits |
|-------------------------------------------|---------|
| M E 361 - Thermodynamics | 3 |
| BSE 375 Biological Concepts for Engineers | 3 |
| EMA 303 – Mechanics of Materials | 3 |
| Physics 202 – General Physics | 5 |
| Ag & Life Sciences (See VI.C.) | 3 |
| | 17 |

| Year 3 – Spring Semester Courses | Credits |
|----------------------------------------------------------------|---------|
| BSE 472 – Sediment and Bio-Nutrient Engineering and Management | 3 |
| BSE 365 – Measurements and Inst. for Biological Systems | 3 |
| EPD 397 – Technical Communications (See I.C.) | 3 |
| Technical Elective (See VI.D.) | 3 |
| Technical Elective (See VI.D.) | 3 |
| | 15 |

| Year 4 – Spring Semester Courses | Credits |
|---------------------------------------|---------|
| BSE 571 – Small Watershed Engineering | 3 |
| Humanities (See I.E. 3) | 3 |
| Technical Elective (See VI.D.) | 3 |
| Technical Elective (See VI.D.) | 3 |
| Technical Elective (See VI.D.) | 4 |
| | 16 |

Notes: Need 128 credits to complete degree. If Chemistry 103 & 104 is taken in place of Chemistry 109, it is suggested to take Chemistry 103 in Fall semester and Chemistry 104 in Spring semester of year 1.