

Appendix 3. Course Matrices. 1. Undergraduate course matrix based on the objectives and their expected learning outcomes listed in Table 2 for all 40 undergraduate courses listed for Biological Sciences. Introductory courses are highlighted in yellow, intermediate courses for the major are blue (baccalaureate writing courses in dark blue), and advanced courses are green.

| Course/Learning Outcome | Obj. 1 | | Objective 2 | | Obj 3 | Objective 4 | | | | | | | Obj 5 | |
|--|--------|-----|-------------|-----|-------|-------------|-----|-----|-----|-----|-----|-----|-------|---|
| | 1.1 | 1.2 | 2.1 | 2.2 | 3.1 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 5.1 | |
| 100-level introductory courses | | | | | | | | | | | | | | |
| BIOS 105 Environmental Biology (3) | 3 | 3 | 3 | 3 | 2 | 2 | | | | | | | 3 | 2 |
| BIOS 110 Biology Laboratory (1) | 3 | | | | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | | |
| BIOS 112 Principles of Biology (3) | 3 | | 3 | | 3 | | | | | | | | | |
| BIOS 150 Molecular & Cellular Biology (4) | 3 | 3 | 3 | 2 | 2 | 3 | | 3 | 3 | | 3 | 2 | 3 | |
| BIOS 151 Organismal Biology (4) | 3 | 3 | 3 | 2 | 2 | 3 | | 3 | 3 | | 3 | 2 | 3 | |
| BIOS 191 Intro Human Anatomy & Biology (4) | 3 | | 3 | | | | | | | | | | | 2 |
| 200/300-level intermediate courses | | | | | | | | | | | | | | |
| BIOS 202 Botany (4) | 3 | 3 | 3 | | | | | | | | | | | |
| BIOS 211 Human Anatomy (4) | 3 | 2 | 3 | | | | | | | | | | | |
| BIOS 232 Microbiology & Infect. Diseases (4) | 3 | | 3 | | 2 | 3 | | 3 | | | 2 | | | |
| BIOS 234 Outdoor Science (4) | 3 | | 2 | | | | | | | | | | | |
| BIOS 240 Human Physiology (4) | 3 | 2 | 3 | | 2 | | | 2 | | 2 | | | | |
| BIOS 250 Genetics (3) | 3 | 3 | 3 | | 2 | | | | | | | | | 3 |
| BIOS 301 Ecology (5) | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BIOS 312 Microbiology (5) | 3 | 3 | 3 | | 2 | 3 | | 3 | | | 2 | | | 3 |
| BIOS 319 Plant Physiology (4) | 3 | 3 | 3 | 3 | | 3 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BIOS 350 Human Physiology (5) | 3 | 3 | 3 | 3 | 2 | 3 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 400-level advanced courses | | | | | | | | | | | | | | |
| BIOS 427 Systematic Botany (4) | 3 | 3 | 3 | | | | | | | | | | | |
| BIOS 430 Evolution (3) | 3 | 3 | 3 | | 2 | | | | | | | | | |
| BIOS 439 Animal Behavior (3) | 3 | 3 | 3 | | | | | | | | | | | |
| BIOS 441 Invertebrate Zoology (3) | 3 | 3 | 3 | | | | | | | | | | | |
| BIOS 456 Tropical Biology (3) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | |
| BIOS 498 Readings in Biol. Sciences (1-3) | 3 | 3 | 3 | | 2 | | | | | | 2 | 2 | 2 | |
| BIOS 499 Independent Research (1-4) | 3 | 3 | 3 | | 2 | 3 | | 3 | | | | | | |

| Course/Learning Outcome | Obj. 1 | | Objective 2 | | Obj 3 | Objective 4 | | | | | | | Obj 5 |
|---|--------|-----|-------------|-----|-------|-------------|-----|-----|-----|-----|-----|-----|-------|
| | 1.1 | 1.2 | 2.1 | 2.2 | 3.1 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 5.1 |
| 500-level advanced courses | | | | | | | | | | | | | |
| BIOS 507 Biology of Addictive Drugs (3) | 3 | 3 | 3 | 2 | | | | | | | 2 | | 2 |
| BIOS 524 Microbial genetics (3) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 525 Microbial Ecology (3) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 526 Molecular Biology Lab (3) | 3 | 3 | 3 | | 2 | | | 3 | | 3 | 3 | | |
| BIOS 531 Biology of Aging (3) | 3 | 3 | 3 | 2 | 3 | | | | | | 2 | | 2 |
| BIOS 534 Virology (3) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 536 Immunology (4) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 542 Entomology (4) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 547 Ornithology (3) | 3 | 3 | 3 | 3 | 3 | | | | | | | | 3 |
| BIOS 549 Field Ecology (3) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 553 Limnology (3) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 559 Neurobiology (4) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 560 Toxicology (3) | 3 | 3 | 3 | | 2 | | | | | | | | |
| BIOS 561 Pharmacology (3) | 3 | 3 | 3 | 2 | 3 | | | | | | 2 | | 2 |
| BIOS 570 General Pathology (4) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 574 Developmental Biology (4) | 3 | 3 | 3 | | | | | | | | | | |
| BIOS 597 Topics in Biol. Sciences (3-4) | 3 | 3 | 3 | 3 | 3 | | | | | 3 | 2 | 3 | 3 |

1 = minor component, 2 = average component, 3 = major component

2. Graduate course matrix based on the objectives and their expected learning outcomes listed in Table 2 for all 36 graduate courses listed for Biological Sciences. Required core courses for both master's and doctoral programs are yellow, required doctoral courses are pink, required master's in biological sciences courses are blue, and required master's in molecular biotechnology courses are light green.

| Course/Learning Outcome | Objective 1 | | Objective 2 | | Obj 3 | Objective 4 | | | | | | | Obj 5 | Objective 6 | |
|---|-------------|-----|-------------|-----|-------|-------------|-----|-----|-----|-----|-----|-----|-------|-------------|-----|
| | 1.1 | 1.2 | 2.1 | 2.2 | 3.1 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 5.1 | 6.1 | 6.2 |
| 500-level courses | | | | | | | | | | | | | | | |
| BIOS 507 Biology of Addictive Drugs (3) | 3 | 3 | 3 | 2 | | | | | | | 2 | | 2 | | |
| BIOS 524 Microbial genetics (3) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 525 Microbial Ecology (3) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 526 Molecular Biology Lab (3) | 3 | 3 | 3 | | 2 | | | 3 | | 3 | 3 | | | | |
| BIOS 531 Biology of Aging (3) | 3 | 3 | 3 | 2 | 3 | | | | | | 2 | | 2 | | |
| BIOS 534 Virology (3) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 536 Immunology (4) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 542 Entomology (4) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 547 Ornithology (3) | 3 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| BIOS 549 Field Ecology (3) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 553 Limnology (3) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 559 Neurobiology (4) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 560 Toxicology (3) | 3 | 3 | 3 | | 2 | | | | | | | | | | |
| BIOS 561 Pharmacology (3) | 3 | 3 | 3 | 2 | 3 | | | | | | 2 | | 2 | | |
| BIOS 570 General Pathology (4) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 574 Developmental Biology (4) | 3 | 3 | 3 | | | | | | | | | | | | |
| BIOS 597 Topics in Biol. Sciences (3-4) | 3 | 3 | 3 | 3 | 3 | | | | | 2 | 3 | | 3 | | |

1 = minor component, 2 = average component, 3 = major component

| Course/Learning Outcome | Objective 1 | | Objective 2 | | Obj 3 | Objective 4 | | | | | | | Obj 5 | Objective 6 | | |
|---|-------------|-----|-------------|-----|-------|-------------|-----|-----|-----|-----|-----|-----|-------|-------------|-----|---|
| | 1.1 | 1.2 | 2.1 | 2.2 | 3.1 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 5.1 | 6.1 | 6.2 | |
| 600-level courses | | | | | | | | | | | | | | | | |
| BIOS 601 Special Investigations (2-6) | 3 | 3 | | | | | | | | | | | | | | |
| BIOS 602 Seminar: Variable Topics (2-6) | 3 | 3 | | | | | | | | | | | | | | |
| BIOS 605 Biol. Sci. Colloquium (1x2/3) | 2 | 1 | | | 3 | 3 | | | | 3 | 3 | 3 | 3 | | | |
| BIOS 610 Teaching of Biol. Sci. (1-4) | | | | | | | | | | | | | | | | |
| BIOS 611 Eukaryotic Cell Biology (3) | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | 3 | 3 | | |
| BIOS 612 Prokaryotic Cell Biology (3) | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | 3 | 3 | | |
| BIOS 613 Animal Physiology (3) | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | 3 | 3 | | |
| BIOS 614 plant Physiology (3) | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | 3 | 3 | | |
| BIOS 615 Ecology (3) | 3 | 3 | 3 | 3 | 3 | | | | 2 | | 3 | 2 | 3 | 3 | | |
| BIOS 616 Evolution (3) | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | 3 | 3 | | |
| BIOS 620 Mutagenesis/Carcinogenesis (3) | | | | | | | | | | | | | | | | |
| BIOS 630 Biological Imaging (3) | 3 | 3 | 3 | 3 | 3 | | | | | | 3 | | | | | |
| BIOS 633 Topics in Biol. Sci. (3) | | | | | | | | | | | | | | | | |
| BIOS 699 Laboratory Rotations (1-4) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | |
| 700-level courses | | | | | | | | | | | | | | | | |
| BIOS 700 Master's Thesis (6) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BIOS 710 Independent Research (2-6) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BIOS 712 Professional Field Exp. (2-12) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BIOS 730 Doctoral Dissertation (15) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | |
| BIOS 735 Graduate Research (2-10) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | |
| Master of Science in Molecular Biotechnology: Required courses | | | | | | | | | | | | | | | | |
| CHEM 520 Instrumental Methods (3) | 3 | 3 | | | 3 | | 3 | 3 | 3 | | 3 | | | | | |
| CHEM 552 Biochemistry 1 with lab (4) | 3 | 3 | | | | | | | | | | | | | | |
| CHEM 609 Advanced Topics in Chem. (3) | 3 | 3 | | | | | | | | | | | | | | |
| CHEM 650 Proteins & Nucleic Acids (3) | 3 | 3 | | | | | | | | | | | | | | |
| STAT 567 Stat. Design & Anal. Exper. (4) | 3 | 3 | | | 3 | | | | 3 | | | | | | | |
| STAT 622 Prep. Large Data Sets (3) | 3 | 3 | 3 | | | | | | 3 | | | | | | | |