MAJOR IN BIOTECHNOLOGY (2013-2014)

Bioinformatics

Date: __________ ID: __________________ Name: ______________________________________

E-mail: __________________ Phone: ________________________________________________

☐ English Composition Requirement ................................................................................. 0-8
(See College requirement) ____________________ ___________________

☐ Upper Division Composition (may overlap with English Composition Requirement) ...... 4

☐ Breadth/General Education ........................................................................................................ 24-32
(See University requirement)

☐ General Education II
☐ General Education III
☐ IGETC

☐ Preparatory Subject Matter ...................................................................................................... 58-66
☐ PLS 120 (4), Applied Statistics in Ag. Science (F); or STA 100 (4), Applied Statistics for
  Bio. Sciences (FWSU)
☐ BIT 1 (4), Introduction to Biotechnology (S)
☐ BIS 2A (5), Intro. Biology (FWSU)
☐ BIS 2B (5), Intro. Biology (FWSU)
☐ BIS 2C (5), Intro. Biology (FWSU)
☐ CHE 2A (5), General Chemistry (FWU)
☐ CHE 2B (5), General Chemistry (WSU)
☐ CHE 2C (5), General Chemistry (FSU)
☐ Organic Chemistry, select one of the following groups:
  ☐ CHE 8A (2), Organic Chem.: Brief Course (FSU); and
  ☐ CHE 8B (4), Organic Chem.: Brief Course (FWU); or
  ☐ CHE 118A (4), Organic Chem. For Health and Life Sciences (FWSU); and
  ☐ CHE 118B (4), Organic Chem. For Health and Life Sciences (FWSU); and
  ☐ CHE 118C (4), Organic Chem. For Health and Life Sciences (FWSU); or
  ☐ CHE 128A (3), Organic Chem. (FW); and
  ☐ CHE 128B (3), Organic Chem. (WS); and
  ☐ CHE 128C (3), Organic Chem. (FS); and
  ☐ CHE 129A (2), Organic Chem. Lab (FW)

☐ Math, select one from the following groups:
  ☐ MAT 16A (3), Short Calculus (FWSU); and
  ☐ MAT 16B (3), Short Calculus (FWSU); or
  ☐ MAT 17A (4), Calculus for Bio and Med (FWS); and
  ☐ MAT 17B (4), Calculus for Bio and Med (FWS); or
  ☐ MAT 21A (4), Calculus (FWSU); and
  ☐ MAT 21B (4), Calculus (FWSU)
☐ PHY 7A (4), General Physics (FWSU)
☐ PHY 7B (4), General Physics (FWSU)
Depth Subject Matter..........................................................................................................................16-20

- BIS 101 (4), Genes and Gene Expression (FWSU) BIS 2C; CHE 8B or 118B or 128B
- BIS 104 (3), Regulation of Cell Function (FWSU) BIS 101 and (102 or 105)
- MCB 121 (3), Molecular Biology of Eukaryotic Cells (FWS) BIS 101 and (103 or 105)
- BIT 171 (3), Professionalism and Ethics in Genomics and Biotechnology (FWS) UD
  standing/natural science major
- 192, Internship; and/or 199, Independent Research; and/or BIT 189L, Laboratory
  Research in Genomics and Biotechnology; (3 total) (FWSU) consent of instructor
- BIT 188 (3), Undergraduate Research Proposal (S) upper div. standing (Optional)
- BIT 194H (1), Honor's Undergraduate Thesis (Optional)

Specific Course Requirements............................................................................................................31-38

- ECS 10 (4), Concepts of Computing (FWSU) 2 yrs high school algebra (Optional – recommend for
  students with no previous computer programming experience)

- Biochemistry, select one of the following groups:
  - BIS 105 (3), Biomolecules and Metabolism (FWS) BIS 2C; CHE 8B or 118B or 128B
  - BIS 102 (3), Structure and Function of Biomolecules (FWSU) CHE 8B or 118B or 128B;
    BIS 103 (3), Bioenergetics and Metabolism (FWSU) BIS 102
  - ABI 102 (5), Animal Biochemistry and Metabolism (F) CHE 8B or 118B or 128B;
    ABI 103 (5), Animal Biochemistry and Metabolism (W) ABI 102
- MIC 101 (5), Introductory Microbiology (FWSU) BIS 2A, CHE 2B (may be taken concurrently)
- ECS 20 (4), Discrete Math for Computer Science (FWS) MAT 21A
- ECS 30 (4), Introduction to Programming and Problem Solving (FWS) MAT 16A or 21A;
  experience with basic programming
- ECS 124 (4), Theory and Practice of Bioinformatics (S) ECS 10 or 30, or ENG 6; STA 100 or
  ECS 129 (4), Computational Structural Bioinformatics (W) ECS 10 or 30
- MCB 182 (3), Principles of Genomics (W) BIS 101
- BIS 181 (3), Comparative Genomics (F) BIS 101 or BIS 183 (3), Functional Genomics (S)
  BIS 101; BIS 102 or 105 recommended
- BIS 180L (5), Genomics Laboratory (S) MCB 182; BIS 181 or BIS 183
 Restricted Electives

- ___ANG 212 (2), Sequence Analysis in Molec. Genetics (not currently being offered) BIS 101; instructor consent
- ___BIS 132 (4), Introduction to Dynamic Models in Modern Biology (not currently being offered) MAT 16C; STA 100
- ___BIS 181 (3) Comparative Genomics (F) BIS 101
- ___BIS 183 (3) Functional Genomics (S) BIS 101; course 102 or 105 recommended
- ___BIT 188 (3), Undergraduate Research Proposal (S) upper div. standing
- ___ECS 40 (4), Software Development and Object-Oriented Programming (FWS) ECS 30
- ___ECS 50 (4), Computer Organization and Machine-Dependent Programming (FS) ECS 40
- ___ECS 60 (4), Data Structures and Programming (FWSU) ECS 20 and 40
- ___ECS 122A (4), Algorithm Design and Analysis (WS) ECS 20 and 60
- ___ECS 124 (4), Theory and Practice of Bioinformatics (S) ECS 10 or 30, or ENG 6; STA 100
- ___ECS 129 (4), Computational Structural Bioinformatics (W) ECS 10 or 30
- ___ECS 140A (4), Programming Languages (FW) ECS 50 or EEC 70, and ECS 60
- ___ECS 150 (4), Operating Systems and System Programming (FS) ECS 40, and ECS 154A or ECS 70, and ECS 154B or EEC 170 strongly recommended
- ___ECS 154A (4), Computer Architecture (FWSU) ECS 50 or EEC 70, and ECS 60
- ___ECS 166 (4), Scientific Data Management (not currently being offered) ECS 40; MAT 21C
- ___EVE 100 (4), Introduction to Evolution (FWSU) BIS 2C; BIS 101; MAT 16C; STA 13 or 100
- ___EVE 102 (4), Population and Quantitative Genetics (F even years) BIS 101, and STA 100 or 102, and EVE 100
- ___EVE 103 (4), Phylogeny and Macroevolution (W even years) EVE 100
- ___MAT 124 (4), Mathematical Biology (S even years) MAT 22A or 67; MAT 22B or equiv.
- ___MIC 115 (3) Recombinant DNA Cloning and Analysis (F) BIS 101
- ___NBP 132 (3) Genes, Nutrients, and Health (F) BIS 2A
- ___STA 130A (4), Brief Mathematical Statistics (F) MAT 16B
- ___STA 130B (4), Brief Mathematical Statistics (W) STA 130A
- ___STA 131A (4), Introduction to Probability Theory (FS?) MAT 21A, 21B, 21C, and 22A
- ___STA 131B (4), Introduction to Probability Theory (W) STA 131A or MAT 135A
- ___STA 141 (4), Statistical Computing (F) STA 130A or 131A, and one of STA 13, 32, 100, 102, or equiv., and experience in computer programming; STA 130B or 131B rec.