

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
One of: UWP 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 102H, 102I, 102J, 102K,
102L, 104A, 104B, 104C, 104D, 104E, 104F, 104I, 104T

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.....7**
- ☐__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 (FWU) *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*
 - ☐__NPB 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.*