

MAJOR IN BIOTECHNOLOGY (2013-2014)
Fermentation/Microbiology

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.....**24-36**
(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.....23-30

- ___ Biochemistry, select one of the following groups:
 - ___ 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;* and
 - ___ ABI 103 (5), Animal Biochemistry and Metabolism (W) *ABI 102*
- ___ MIC 104 (4), General Microbiology (F) *BIS 101;103*
- ___ Select two of the following courses:
 - ___ MIC 140 (3), Bacterial Physiology (not being offered) *BIS 101,103/105 (concurrently ok) MIC 102 or 104 recommended*
 - ___ MIC 150 (3), Bacterial Genetics (not being offered) *BIS 101; 102 or 105; MIC 102 or 104 recommended (may be taken concurrently)*
 - ___ PLP 130 (3), Fungal Biotechnology and Biochemistry (W) *BIS 103*
 - ___ MIC 170 (3), Yeast Molecular Genetics (not being offered) *BIS 101; 102 or 105; MIC 102 or 104 recommended (may be taken concurrently)*
 - ___ MIC 115 (3), Recombinant DNA Cloning and Analysis (F) *BIS 101 or equivalent*
 - ___ MCB 182 (3), Principles of Genomics (W) *BIS 101*
 - ___ BIS 181 (3), Comparative Genomics (F) *BIS 101*
 - ___ BIS 183 (3), Functional Genomics (S) *BIS 101; BIS 102 or 105 recommended*
- ___ MIC 104L (3), General Microbiology Lab (F), *MIC 104 (may be taken concurrently);* **or** FST 104L (4), Food Microbiology Lab (S) *BIS 2A, FST 104*
- ___ BIT 161A (6) Genetics and Biotechnology Lab (WU) *PLS 152 or BIS 101;***or** MCB 160L (4), Principles of Genetics Laboratory (FWS) *BIS 101*

☐ Restricted Electives.....15

Note: No course may be used to satisfy more than one requirement.

Select from:

- ___ BIS 132 (4) Dynamic Models in Modern Biology *BIS 2A, MAT 16C, STA 13*
- ___ BIS 181 (3) Comparative Genomics (F) *BIS 101*
- ___ BIS 183 (3) Functional Genomics (S) *BIS 101; course 102 or 105 recommended*
- ___ BIT 150 (4), Applied Bioinformatics (Not offered) *ECS 10 or 15, or PLS 21; BIS 101 and 104; PLS 120, or STA 13 or 100*
- ___ BIT 188 (3), Undergraduate Research Proposal (S) *Upper division standing*
- ___ BIT 161B (4), Plant Genetics and Biotechnology Lab (S) *PLS 152 or BIS 101*
- ___ CHE 107A (3), Physical Chemistry for the Life Sciences (F) *CHE 2C, MAT 16C or 21C, one year of physics*
- ___ CHE 107B (3), Physical Chemistry for the Life Sciences (W) *CHE 107A*
- ___ CHE 130A (3), Pharmaceutical Chemistry (W) *CHE 118C or 128C*
- ___ CHE 130B (3), Pharmaceutical Sciences (S) *CHE 130A*
- ___ ECH 161C (4), Biotechnology Facility Design and Regulatory Compliance (W) *ECH 161A & 161B (may be taken concurrently)*
- ___ ECH 161L (4), Bioprocess Engineering Lab (S) *ECH 161A and 161B, or BIS 103 and MCB 120L*
- ___ ECS 124 (4) Theory and Practice of Bioinformatics (F) *ECS 10 or 30, or ENG 6; STA 100*
- ___ EVE 100 (4), Introduction to Evolution (FWSU) *BIS 2C, BIS 101, MAT 16ABC, STA 13 or 100*
- ___ FST 102A (4), Malting and Brewing Science (W) *BIS 103; senior standing recommended*
- ___ FST 102B (4), Practical Malting and Brewing (S) *FST 102A and analytical experience beyond CHE 2C, such as VEN 123, FST 103 and 123L, MCB 120L*
- ___ FST 104 (3), Food Microbiology (W) *BIS 2A, 102*
- ___ FST 104L (4), Food Microbiology Lab (S) *BIS 2A, FST 104*
- ___ FST 110A (3), Physical Principles in Food Processing (F) *PHY 7A-7B-7C or equiv., calculus recommended*
- ___ FST 110B (3) Heat and Mass Transfer in Food Processing (W) *FST 110A or equiv.; ABT 110L recommended (may be taken concurrently)*
- ___ FST 123 (3), Intro. to Enzymology (S) *BIS 103*
- ___ FST 123L (2), Enzymology Lab (S) *BIS 103, FST 123 (concurrently)*
- ___ MIC 105 (3), Bacterial Diversity (W) *MIC 102 or 104, BIS 102, BIS 103 recommended*
- ___ MIC 105L (2), Bacterial Diversity Laboratory (W) *MIC 102, 102L or 104, 104L, BIS 105, MIC 105 (may be taken concurrently), BIS 103 recommended*
- ___ MIC 115 (3), Recombinant DNA Cloning and Analysis (F) *BIS 101*
- ___ MIC 140 (3), Bacterial Physiology (F) *BIS 101, 102, 103 (may be taken concurrently) or BIS 101 and 105; MIC 102 OR 104 recommended (may be taken concurrently)*
- ___ MIC 150 (3), Bacterial Genetics (W) *BIS 101; 102 or 105; MIC 102 or 104 recommended (may be taken concurrently)*
- ___ MIC 155L (4), Bacterial Physiology Lab (not currently offered) *MIC 140 or 150, 102L or 104L, consent of instructor*
- ___ MIC 162 (4), General Virology (W) *BIS 102 or 105*
- ___ MIC 170 (3), Yeast Molecular Genetics (S) *BIS 101 and 102, MIC 102 or 104 strongly recommended (may be taken concurrently)*
- ___ MCB 120L (6), Biotechnology Lab (FWSU) *BIS 103 (may be taken concurrently)*
- ___ MCB 164 (3), Advanced Eukaryotic Genetics (S) *MCB 161 or 121*
- ___ PLP 130 (3), Fungal Biotechnology and Biochemistry (W), *BIS 103*
- ___ PLP 140 (4), Agricultural Biotechnology, Ethics and Public Policy (S) *none*
- ___ PLS 174 (3), Microbiology and Safety of Produce (not currently offered) *PLS 2 or BIS 2C*
- ___ VEN 124 (2) Wine Production (F) *VEN 3, 123 (may be taken concurrently), BIS 102 (requires PTA from department)*
- ___ VEN 124L (3), Wine Production Lab (F) *VEN 124 (may be taken concurrently) (requires PTA from department)*
- ___ VEN 128 (2), Wine Microbiology (W) *VEN 123 and 124; Microbiology 102 and 102L, or FST 104 and 104L; VEN 125 and 126 recommended (requires PTA from department)*
- ___ VEN 135 (4), Wine Technology and Winery Systems (S) *VEN 124 (requires PTA from department)*
- ___ MCB 182 (3), Principles in Genomics (W) *BIS 101, MCB 121*